

Current Research on Multiple Births

ANNUAL BIBLIOGRAPHY — 1990

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Subject Sections *

Title, authors, and journal source, alphabetized by journal:

- Behavior and Physiology
- Genetic Traits and Methods
- Obstetrics and Pediatrics
- General

Author Section

Authors, titles, journal source, and abstract (if available), alphabetized and cross-indexed by all authors.

* The first three subject sections include other topics related to these headings. Classification is performed automatically on the basis of keywords. Some articles may appear in two or three of the specific subject sections.

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- † Primary central nervous malignant melanoma in the bathing trunk naevus syndrome. Salisbury JR, et al. *Postgrad Med J* 1989 Jun;65(764):387-9
- † Alpha-fetoprotein and acetylcholinesterase in twins discordant for neural tube defect. Johnson VP, et al. *Prenat Diagn* 1989 Dec;9(12):831-7 (15 ref.)
- † Tracheobronchial clearance in asthma-discordant monozygotic twins. Svartengren M, et al. *Respiration* 1989;56(1-2):70-9
- † Unique anomalies in cephalothoracopagus janiceps conjoined twins with implications for multiple mechanisms in the abnormal embryogenesis. Baron BW, et al. *Teratology* 1990 Jan;41(1):9-22 (37 ref.)
- † Anatomic findings in dicephalic conjoined twins: implications for morphogenesis. Siebert JR, et al. *Teratology* 1989 Oct;40(4):305-10
- † Meckel syndrome in twins. Kural N, et al. *Turk J Pediatr* 1989 Jan-Mar;31(1):79-82

† indicates that an abstract appears with the citation in the author section.

AUTHOR SECTION

A

- Abe K** see **St George-Hyslop PH**
- Adams TD** see **Ghio AJ**
- Afman GH** see **Ghio AJ**
- Agahi E** see **Lynn R**
- Ager JW** see **Drugan A**
- Alpert BS** see **Valauri FA**
- Amarose AP** see **Baron BW**
- Amato M, Hüppi P, Schneider H:** Hypoxic risk in twins assessed by serum creatinine kinase brain isoenzyme measurement. *Eur J Obstet Gynecol Reprod Biol* 1990 Jan-Feb;34(1-2):73-8
- A marked intrainpair discordance in placentas and in many body and organ measurements are risk factors influencing perinatal mortality and morbidity in twins. Asphyxia is the single most important perinatal cause of neurologic morbidity in newborn infants. The higher hypoxic risk for the second twin arises, however, from conclusions based on studies that did not consider the new diagnostic possibility of using blood measurements of the brain-type isoenzyme of creatine kinase (CK-BB) as a marker of perinatal asphyxia. CK-BB levels were measured in cord blood of 60 preterm infants (mean birth weight 1670 +/- 390 g, and mean gestational age 33 +/- 1.9 weeks) born of twin gestation in the last 3 years. The mean CK-BB values were 48 +/- 40 U/l versus 29 +/- 31 U/l (p less than 0.5). Skillful antepartum and perinatal care are the keys for optimal management of both babies, as demonstrated by similar CK-BB values obtained in their cord-blood specimens after birth.
- Amato M, Howald H, Schneider H:** Neurosonographic assessment of twin pairs in the perinatal period. *Eur Neurol* 1990;30(1):9-13
- Twins have higher rates of perinatal mortality, prematurity and its complications, low birth weight, intrauterine growth retardation, congenital anomalies and long-term developmental morbidity. In 31 twin pairs we evaluated the incidence and severity of peri-intraventricular hemorrhage (PIVH) and post-hemorrhagic ventricular dilatation. On ultrasonography minor PIVH (grades I and II) was observed in 26% of A twins and 25% of B twins (p less than 0.5). Major PIVH (grades III and IV) was less common, occurring in 3% of A twins and 6% of B twins (p less than 0.5). Ventriculomegaly, mostly regressive was equally distributed between the two groups of babies. From these results it can be concluded that with efficient antenatal care and skillful perinatal management of twin pregnancy, the incidence of major perinatal neurological complications such as PIVH and ventriculomegaly are not higher in the second-born twin.
- Amery A** see **Bielen E**
- Antero Kesäniemi Y, Koskenvuo M, Vuoristo M, Miettinen TA:** Biliary lipid composition in monozygotic and dizygotic pairs of twins. *Gut* 1989 Dec;30(12):1750-6
- The relative contribution of genetic factors to biliary and serum lipid composition was studied in 17 monozygotic and 18 dizygotic middle aged male pairs of twins. Cholesterol precursors, squalene and Methylated sterols which reflect the activity of cholesterol synthesis were also measured. Pairwise intraclass correlations were determined for monozygotic and dizygotic twin pairs and heritability estimates were calculated. Molar % of biliary cholesterol and percentage distribution of biliary cholic acid and particularly deoxycholic acid showed significant pairwise correlations within the

monozygotic but not the dizygotic pairs. Similar correlations were found for total biliary methylsterols and of the methylsterol subfractions for the two methostenols but not for squalene, lanosterol and dimethylsterols. In serum, the precursor sterols, but not squalene, showed even higher pairwise correlations in the monozygotic twins than the corresponding precursors in bile. Molar per cent of bile acids and phospholipids and cholesterol saturation index were not correlated significantly in either twin pairs, but the pairwise correlations tended to be higher in the monozygotic than in the dizygotic pairs. Gall stones were found in seven monozygotic and three dizygotic subjects. Two monozygotic twin pairs were concordant for gall stones; all the dizygotic pairs were discordant. Overall, these data suggest that molar percentage of biliary cholesterol, bile acid composition, cholesterol synthesis, bile cholesterol saturation, and gall stone formation may be under a significant genetic control.

- Antinori S** see **Fishe S**
- Antti-Poika M** see **Juntunen J**
- Aoyama T** see **Nagao M**
- Argenta LC** see **Valauri FA**
- Armson BA** see **Ludmir J**
- Astemborski JA** see **Berg KA**

B

- Baker LA, Daniels D:** Nonshared environmental influences and personality differences in adult twins. *J Pers Soc Psychol* 1990 Jan;58(1):103-10
- The twin design was used to examine the importance of different experiences of siblings within the family and to identify relations between twins' personality differences and their differential experiences. A sample of 161 monozygotic and 74 dizygotic twin individuals between the ages of 18 and 75 years retrospectively reported on their different experiences when growing up. The Sibling Inventory of Differential Experience (SIDE) was used for the first time with a sample of twin siblings. In addition, the twins provided self-report measures of affect and personality. In contrast to results from a sibling adoption design, this study of twins showed greater evidence for genetic variance in the SIDE scales. Nevertheless, the SIDE showed significant associations with differences in personality and affect for monozygotic twins, which reflect pure environment-behavior relations.
- Baker LA** see **Mitchell JE**
- Baldwin VJ, Wittmann BK:** Pathology of intragestational intervention in twin-to-twin transfusion syndrome. *Pediatr Pathol* 1990; 10(1-2):79-93
- Selective intervention in multiple pregnancy is being used to enhance the chances of survival of at least one conceptus when the risks for the combined conceptuses and mother are considered too great. These procedures have been applied to induced polyembryonic conceptions (selective continuation) and discordant dichorionic twins (selective birth). We report attempts at selective intervention in three monochorionic twin gestations affected by twin-to-twin transfusion syndrome. In all three cases, both fetuses seemed doomed and the mother was in significant distress. The selected survivor in the first case is doing well; both twins were stillborn in the second case; in the third case, the selected survivor died as a neonate but the other twin survived and is doing well. We suggest possible

AUTHOR SECTION

explanations for the clinical outcome of each case based on detailed pathologic examination of the delivered placentas and autopsy examination of the nonsurviving twins. The shared chorionic circulation is the source of both the clinical disorder and the potential complications of any attempt to alleviate the disorder. This situation is unique to monochorionic twins, and we discuss the implications of this for intrauterine therapy of twin-to-twin transfusion syndrome.

Baron BW, Shermeta DW, Ismail MA, Ben-Ami T, Yousefzadeh D, Carlson N, Amarose AP, Esterly JR: Unique anomalies in cephalothoracopagus janiceps conjoined twins with implications for multiple mechanisms in the abnormal embryogenesis. *Teratology* 1990 Jan;41(1):9-22 (37 ref.)

The anatomic features of female conjoined twins with the Janiceps type of cephalothoracopagus are described. *Abnormalities included bilateral clefts of the alveolar arches, shared rudimentary mandible, high, arched clavicles, multiple rib deformities, single shared foregut and small intestine, absent large intestines, omphalocele, multicystic kidneys, hypoplastic lungs, interconnected aortas and neck vessels, single ovary with elongated uterus in each twin, displaced labia, abnormal segmentation of the vertebrae, spinal dysraphism, diastasis of the symphysis pubis, malrotated lower extremity, bilateral posterior dislocation of the hips, and club feet.* There were two hearts with internal anomalies. Both spinal cords had a myelocele in the lumbar region. The abnormalities noted in previous reports of conjoined twins of this type are reviewed and compared. We propose that factors associated with conjoining, dysgenetic (developmental) defects, and deformations resulting from crowding in utero all may have been important in the abnormal development in this case.

Beal S: Sudden infant death syndrome in twins. *Pediatrics* 1989 Dec;84(6):1038-44

The incidence of sudden infant death syndrome is higher among twins than it is among singleton infants. Incidence of sudden infant death syndrome in twins in South Australia, is discussed, as well as some features of these twins and the health of the cotwins. The literature concerning the status of the cotwin is reviewed.

Bell J see **Hardman PD**

Ben-Ami T see **Baron BW**

Ben-Ezra Z see **Singer A**

Ben-Shlomo I, Zohar S: Quadruplets following cessation of clomiphene citrate. A case of sustained effect. *Acta Obstet Gynecol Scand* 1989; 68(4):379-80

We report a case of quadruplet birth in a young oligomenorrheic woman, who had been prescribed clomiphene citrate for two consecutive cycles. She conceived following cessation of treatment and an intervening menstruation. Ultrasonic follow-up which concurred with the last menstrual period dating indicated multiple ovulation as a sustained effect of clomiphene citrate medication.

Ben-Yehuda O see **Singer A**

Berg K, Kierulf P: DNA polymorphisms at fibrinogen loci and plasma fibrinogen concentration. *Clin Genet* 1989 Oct;36(4):229-35

Associations have been reported between restriction fragment length polymorphisms (RFLPs) at fibrinogen loci and plasma fibrinogen concentration, in a British study. We have examined a series of unrelated Norwegians. We found no association between plasma fibrinogen concentration and any genotype in either of two fibrinogen polymorphisms

examined (one at the alpha-fibrinogen locus, the other at the beta-fibrinogen locus). We have also examined monozygotic twins and evaluated heritability of fibrinogen level by the intraclass correlation coefficient. We arrived at an unimpressive estimate of heritability. With such a low level of heritability, it would have been surprising if we had found an association with a single gene marker in a relatively limited series of people. The reason for the discrepancy between the British and the Norwegian study is unknown. Great care has to be exercised in interpreting disease associations, since with DNA variations being examined at an increasing number of "candidate loci", the risk of finding spurious associations increases with the number of analyses conducted.

Berg KA, Astemborski JA, Boughman JA, Ferencz C: Congenital cardiovascular malformations in twins and triplets from a population-based study.

Am J Dis Child 1989 Dec;143(12):1461-3

Data from the Baltimore-Washington Infant Study of congenital cardiovascular malformations permitted detailed analysis of congenital cardiovascular malformations in 62 twins and 3 triplets and 2303 singleton cases. A probability sample of controls (n = 2793) included 43 twins. The case prevalence of multiple births was 28 of 1000, compared with a 15 of 1000 prevalence among controls (chi 2 = 5.7). There were more girls among case twins than among case singletons and controls (chi 2 = 9.0). Monozygosity was no more frequent in case twins than in controls. Looping defects occurred in 4 monozygotic twin pairs compared with only 1 dizygotic twin pair. The twinning process itself may be implicated in the development of congenital cardiovascular malformations in some of these infants, especially those with looping defects, but concordance of types of defects in 4 of 65 pairs implicates genetic factors in the determination of some forms of congenital cardiovascular malformations.

Berg S see **Pedersen NL**

Bergeman CS, Plomin R, McClearn GE, Pedersen NL, Friberg LT: Genotype-environment interaction in personality development: identical twins reared apart. *Psychol Aging* 1988 Dec;3(4):399-406

The focus of this study is to identify specific genotype-environment (GE) interactions as they contribute to individual differences in personality in later life. In behavioral genetics, GE interaction refers to the possibility that individuals of different genotypes may respond differently to specific environments. A sample of 99 pairs of identical twins reared apart, whose average age is 59 years, has been studied as part of the Swedish Adoption/Twin Study of Aging (SATSA). Hierarchical multiple regression was used to detect interactions between personality and environmental measures after the main effects of genotype and environment were removed. Analyses yield evidence for 11 significant interactions that provide the first evidence for GE interaction in human development using specific environmental measures. Thus, in addition to the main-effect contributions of heredity and environment, GE interactions contribute to individual differences in personality as measured in the second half of the life course.

Bergeman CS see **Plomin R**

Berges W see **Purmann JH**

Bermúdez R see **Quiroz VH**

Bertelsen A see **Gottesman II**

Bertoglio JC see **Fernández H**

Bertrams J see **Purmann JH**

AUTHOR SECTION

- Bevan H** see **Tandan R**
- Bhat BV, Usha TS, Puri RK:** Superfoetation. *Indian J Pediatr* 1989 Mar-Apr;56(2):291-3
- Bielen E, Fagard R, Amery A:** Inheritance of heart structure and physical exercise capacity: a study of left ventricular structure and exercise capacity in 7-year-old twins. *Eur Heart J* 1990 Jan;11(1):7-16
The maximal aerobic power of endurance athletes is high and their heart is characterized by a larger left ventricular internal dimension than in non-athletes, and a proportional increase of wall thickness; these traits may be inherited and/or the consequence of intense physical training. To assess the influence of inheritance on physical exercise capacity and on echocardiographically determined cardiac structure, and to limit the effect of environmental factors as much as possible, we studied 15 monozygotic and 19 dizygotic 6- to 8-year-old twin pairs. Exercise capacity was expressed as the times at which the heart rates of, respectively, 150 and 170 beats min⁻¹ were reached during a progressive exercise test on the treadmill. For these exercise times the within-pair variance was significantly larger in dizygotic compared with monozygotic twins. Therefore significant genetic variance was inferred, both when the exercise times were expressed as absolute values and after adjustment for body weight and gender. As for cardiac structure at rest, the results did not suggest a significant influence of genetic endowment on left ventricular internal diameter or on wall thickness; genetic variance was significant, however, for calculated left ventricular mass (P less than 0.05) and left ventricular mass adjusted for body weight and gender. The results are compatible with the notion that the high aerobic power of endurance athletes is at least partly inherited. Left ventricular internal dimension and wall thickness, which distinguish an athlete's heart at rest from the heart of a non-athlete, do not show a significant genetic component, suggesting that the qualities characteristic of an athlete's heart, at least as assessed at rest, are not inherited. The inheritance of aerobic power may be due to inheritance of non-cardiac factors or to cardiac features which are only expressed during exercise.
- Blake KD, Ratcliffe JM, Wyse RK:** CHARGE association in two monozygous triplets. *Int J Cardiol* 1989 Dec;25(3):339-41
In an unusual set of triplets, two monozygous girls presented with CHARGE association. Dissimilar surgical management of identical cardiovascular lesions has resulted in a disparate effect on their clinical state. Their case poses interesting questions concerning how CHARGE association may develop.
- Blickstein I, Weissman A:** Birth weight discordancy in male-first and female-first pairs of unlike-sexed twins. *Am J Obstet Gynecol* 1990 Mar;162(3):661-3
We studied 153 consecutive twin pairs of unlike sex. Comparison of 71 male-female pairs with 82 female-male pairs showed similar mean twin birth weight and rate of discordance. However, males were significantly heavier (p less than 0.04) compared with females in the male-first but not in the female-first combination. The rate of female discordance was significantly higher compared with male discordance in both fetal sex combinations. It is concluded that females of unlike-sexed pairs are at greater risk to be growth discordant. Fetal sex, therefore, should be included as one of several factors that produce divergent twin growth.
- Bodurtha JN** see **Moskowitz WB**
- Bodurtha JN** see **Schieken RM**
- Boehm AF** see **Diaz AA**
- Boersma ER** see **Offringa PJ**
- Boos R** see **Kanakas N**
- Borchard F** see **Purmann J**
- Bossano R** see **Moskowitz WB**
- Bouchard C** see **Rice T**
- Bouchard TJ Jr** see **Segal NL**
- Bouckaert PX** see **Duvekot JJ**
- Boughman JA** see **Berg KA**
- Bradley WG** see **Tandan R**
- Brandwein SR, Salusinsky-Sternbach M:** Adult Still's disease in only one of identical twins. *J Rheumatol* 1989 Dec;16(12):1599-601
This report describes the occurrence of adult Still's disease in only one of a pair of identical twins after 8 years of followup. This suggests that environmental factors may be important in the development of this rare syndrome in at least some patients.
- Breitenecker G** see **Feichtinger W**
- Broe GA** see **Creasey H**
- Brok KE** see **Elberg JJ**
- Broussain MT** see **Fernández H**
- Brown DM:** Bile plug syndrome: successful management with a mucolytic agent. *J Pediatr Surg* 1990 Mar;25(3):351-2
Common bile duct obstruction, in an infant with bile plug syndrome, was relieved at surgery with a mucolytic agent, after an unsuccessful attempt at clearing the biliary tree with saline irrigation. This procedure obviated choledochotomy in this patient, and may be of use in other infants with ductal obstruction complicating the inspissated bile, associated with gut rest, parenteral nutrition, or diuretic therapy.
- Brown JE, Schloesser PT:** Prepregnancy weight status, prenatal weight gain, and the outcome of term twin gestations. *Am J Obstet Gynecol* 1990 Jan;162(1):182-6
Relationships among prepregnancy weight status, prenatal weight gain, and the outcome of 922 twin gestations delivered at term were retrospectively investigated with the use of data provided by linked birth-death certificates in Kansas, 1980 to 1986. Infant birth weights were found to increase linearly with prenatal weight gain for women who entered pregnancy underweight and at normal weight, but not for women who were overweight or obese at the start of pregnancy. The rate of twin gestation was twice as high in obese women as that in underweight women. The proportion of infants born with low birth weight declined as prepregnancy weight status increased. The mean prenatal weight gain of underweight women who were delivered of term twin infants with birth weights in the range of lowest perinatal mortality (3001 to 3500 gm) was 44.2 +/- 12.4 pounds. For normal-weight women, the corresponding figure was 40.9 +/- 11.3 pounds. These mean gains were significantly higher than the gains of underweight and normal-weight women who were delivered of smaller infants at term.
- Buncke HJ** see **Valauri FA**
- Burke PH:** Intrapair facial differences in twins. *Acta Genet Med Gemellol (Roma)* 1989;38(1-2):37-47
Annual serial records in the form of facial contour maps were examined for 18 like-sexed twin pairs of near equal zygoty distribution. Zygoty diagnosis was based primarily on hematological reports for 26 of the 36 children and the remainder were diagnosed on a basis of the concordance or discordance of various physical characteristics:

AUTHOR SECTION

standing height, finger print ridge count, tooth size, and hair and eye colour. Thirteen facial parameters were measured on 274 maps. After age correcting and three-point smoothing, more than 1,150 intrainpair differences of individual facial parameters were measured. In general, the dizygotic twin pairs had the larger mean intrainpair differences in facial parameters and the monozygotic twin pairs had the smaller intrainpair mean differences. The more important facial parameters for distinguishing the two groups were identified and used to calculate a "facial similarity index".

C

Caglar MK, Koll e LA: Determination of serum ferritin in the evaluation of iron depletion and iron over load in chronic twin-to-twin transfusion syndrome. *J Perinat Med* 1989;17(5):357-9

In two pairs of twins with twin-to-twin transfusion syndrome serum ferritin levels were determined in order to estimate body storage of iron. Serum ferritin levels in the donor twins were found to be markedly lower than in the recipients and were below the lower limit found in normal neonates. One of the recipients was hydropic. His ferritin level was elevated far above the upper limit of normal. These findings support the hypothesis that in chronic twin-to-twin transfusion, depletion of iron stores occurs in the donor while the recipient suffers from iron overload. Determination of ferritin levels may be useful in the investigation of the twin-to-twin transfusion syndrome.

Callen PW see **Filly RA**

Cameron DE, Reitz BA, Carson BS, Long DM, Dufresne CR, Vander Kolk CA, Maxwell LG, Tilghman DM, Nichols DG, Wetzel RC, et al: Separation of craniopagus Siamese twins using cardiopulmonary bypass and hypothermic circulatory arrest. *J Thorac Cardiovasc Surg* 1989 Nov;98(5 Pt 2):961-7

Occipitally joined craniopagus Siamese twins were separated with the use of cardiopulmonary bypass and hypothermic circulatory arrest. The 7-month-old infants shared a large sagittal venous sinus that precluded conventional neurosurgical approach because of risk of exsanguination and air embolism. After craniotomy and preliminary exposure of the sinus, each twin underwent sternotomy and total cardiopulmonary bypass with deep hypothermia. Hypothermic circulatory arrest allowed safe division and subsequent reconstruction of the sinus remnants. Several unusual problems were encountered, including transfusion of a large blood volume from one extracorporeal circuit to the other through the common venous sinus, deleterious warming of the exposed brain during circulatory arrest, and thrombosis of both pump oxygenators. Both infants survived, although recovery was complicated in each by neurologic injury, cranial wound infection, and hydrocephalus. This case demonstrates the valuable supportive role of cardiopulmonary bypass and hypothermic circulatory arrest in the management of complex surgical problems of otherwise inoperable patients.

Camner P see **Svartengren M**

Carlson N see **Baron BW**

Carmelli D see **Swan GE**

Carpenter RJ Jr see **Gonsoulin W**

Carr AJ: Idiopathic thoracic kyphosis in identical twins. *J Bone Joint Surg [Br]* 1990 Jan;72(1):144

Carson BS see **Cameron DE**

Casanova MF see **Suddath RL**

Caspi E see **Ron-El R**

Centerwall BS, Robinette CD: Twin concordance for dishonorable discharge from the military: with a review of the genetics of antisocial behavior. *Compr Psychiatry* 1989 Sep-Oct;30(5):442-6 (20 ref.)

It has been hypothesized that there is a genetic component to antisocial behavior. To test this hypothesis, twin concordance for dishonorable discharge from the US military was examined among 15,924 twin pairs in the National Academy of Sciences-National Research Council (NAS-NRC) Twin Registry, all of whom served in the US military. Of 62 dizygotic (DZ) twin pairs, at least one of whom had received a dishonorable discharge, one pair (1.6%) was concordant for dishonorable discharge; of 47 monozygotic (MZ) twin pairs, seven (14.9%) were concordant for dishonorable discharge. Concordance rates for dishonorable discharge were significantly greater for MZ vDZ twin pairs. Concordances for dishonorable discharge were not confounded by co-diagnoses of alcoholism. The results are discussed in light of research findings suggesting a genetic component to antisocial behavior.

Chalmers RA see **Thompson GN**

Chawla R see **Grover V**

Chen KM see **Chen WJ**

Chen MT see **Chen WJ**

Chen WJ, Chen KM, Chen MT, Liu TK, Chu SH, Tsai TC, Hwang FY: Emergency separation of omphaloischiopagus tetrapus conjoined twins in the newborn period. *J Pediatr Surg* 1989 Dec;24(12):1221-4

This article reports an experience on subemergent separation of xyphoomphaloischiopagus tetrapus conjoined twins in the newborn period when survival of one of the twins was threatened by a severely malformed counterpart.

Chi JG see **Seo JW**

Chiariello F see **Fishel S**

Christison GW see **Suddath RL**

Chu SH see **Chen WJ**

Cleveland S see **Purrmann J**

Cole TJ see **Morley R**

Conneally PM see **St George-Hyslop PH**

Connelly AJ see **Trudinger BJ**

Cook CM see **Trudinger BJ**

Cook JD see **Richards CS**

Copeland KL see **Gonsoulin W**

Cortada JM see **Richards CS**

Coury A see **Farmakides G**

Cramer G see **Kringlen E**

Crapo RO see **Ghio AJ**

Creasey H, Jorm A, Longley W, Broe GA, Henderson AS: Monozygotic twins discordant for Alzheimer's disease. *Neurology* 1989 Nov;39(11):1474-6

We identified 3 pairs of monozygotic twins discordant for probable Alzheimer's disease from a twin register and found no systematic differences in potential risk factor exposures between affected and unaffected twins. Such cases predict a role for environmental factors in the etiology or clinical onset of Alzheimer's disease.

Crosby WM: Twin pregnancy: an appraisal of management options. *J Okla State Med Assoc* 1989 Oct;82(10):516-27

For term twins, delivery in a referral center is probably not important to survival, but the method of delivery might be, depending upon the development of fetal distress and the immediate availability of cesarean section.

AUTHOR SECTION

Cundall DB, Lamb JT, Roussounis SH: Identical twins with idiopathic external hydrocephalus. *Dev Med Child Neurol* 1989 Oct;31(5):678-81
 Monozygotic twins with idiopathic external hydrocephalus are reported. Characteristic computerised tomographic features were associated with early gross motor delay and rapid improvement. A genetic basis for the syndrome is supported by its occurrence in identical twins.

D

Daniels D see **Baker LA**

Danskin F see **Hastie SJ**

Dasilva M see **Vohra K**

de Groot C see **Oudesluys-Murphy AM**

Deighton CM, Walker DJ, Griffiths ID, Roberts DF:

The contribution of HLA to rheumatoid arthritis. *Clin Genet* 1989 Sep;36(3):178-82 (34 ref.)

The contribution of genes within the major histocompatibility complex to rheumatoid arthritis has been calculated (Rotter & Landaw 1984). Separate data from hospital- and population-based studies of monozygotic twin concordance rates and sibling recurrence risks have been used, along with material from published haplotype-sharing studies. *Using either source of information gives the same result, a contribution of 37%.*

Demopoulos RI see **Greco MA**

Deshmukh RN see **Sidhu SS**

Diaz AA, Boehm AF, Rowe WF: Comparison of fingernail ridge patterns of monozygotic twins.

J Forensic Sci 1990 Jan;35(1):97-102

The ridge patterns on the fingernails of corresponding fingers of a pair of twins were compared microscopically and found to be readily distinguishable from one another. Based on blood grouping in six blood group systems (ABO, Rhesus, Ss, Duffy, Kidd, and Kell), the probability that the twins were monozygotic was calculated to be 89.1%.

Dimitrovsky I: On being a twin: how the view may differ for each of the pair [see comments]

J Am Acad Psychoanal 1989 Winter;17(4):639-53

Djursing H see **Secher NJ**

Drugan A, Sokol RJ, Syner FN, Ager JW, Zador IE,

Evans MI: Clinical implications of amniotic fluid alpha-fetoprotein in twin pregnancy.

J Reprod Med 1989 Dec;34(12):977-80

Amniotic fluid alpha-fetoprotein (AF-AFP) was measured in 68 pairs of normal twins.

Acetylcholinesterase (ACHE) was measured in 23 of those pairs. A significant difference in AF-AFP levels was found in 9/49 (19.4%) of twin pairs of the same sex and 9/19 (47.3%) of twin pairs of opposite sexes ($P = .015$). Differences in fetal size or gestational age at amniocentesis did not influence the rate of discordant AFP results. ACHE activity was identical in all amniotic fluid samples in twin pairs. In five additional patients, fetal anomalies (three), fetal death or fetal blood in the sample could have affected AFP levels, which were found to be discordant in three of them. Using fetal sex to represent zygosity, the study indicated that discordance in AF-AFP is more common in dizygous twins. The odds ratio for having a discordant AFP result if twins are of different sexes was 4.0. Implications of our data are: (1) in same-sex twins, discordance between sacs is less common, even if only one fetus is affected; (2) the difference in AFP results in twins of the same sex and of different sexes suggests variability in AFP transfer between twin gestational sacs; and (3) ACHE readily

diffuses between sacs and cannot be used to determine which twin has an abnormality.

Dufresne CR see **Cameron DE**

Duvekot JJ, Theewes BA, Wesdorp JM, Roumen FJ, Bouckaert PX: Congenital cytomegalovirus infection in a twin pregnancy: a case report. *Eur J Pediatr* 1990 Jan;149(4):261-2

A case of congenital cytomegalovirus infection in a twin pregnancy is described, causing neonatal death in one of the infants whereas the other survived without major complications. The possible mechanisms involved are discussed.

Dyess DL see **Powell RW**

Dysken MW see **Segal NL**

E

Eaves LJ see **Schieken RM**

Eckert ED see **Segal NL**

Eisen SA see **Goldberg J**

Elberg JJ, Brok KE, Pedersen SA, Kock KE: Congenital bilateral eventration of the diaphragm in a pair of male twins. *J Pediatr Surg* 1989 Nov;24(11):1140-1

We present a case of congenital bilateral eventration of the diaphragm in a pair of male twins. The case is associated with severe pulmonary hypoplasia.

Both infants died in the neonatal period. An exposure to Thiotepa in the first trimester of the pregnancy is a possible etiologic factor.

Elder FF see **Gonsoulin W**

Elliott CG see **Ghio AJ**

Eng H see **Lefvert AK**

Ericsson CH see **Svartengren M**

Eskola J see **Takala AK**

Eslinger PJ see **Swan GE**

Esterly JR see **Baron BW**

Evans MI see **Drugan A**

Eylenbosch WJ, Van der Auwera JC: Epidemiological twin research in Belgium: a pilot study.

Cah Sociol Demogr Med 1989 Jul-Sep;29(3):263-80

F

Fabsitz RR see **Swan GE**

Fagard R see **Bielen E**

Farmakides G, Schulman H, Schneider E, Mesogitis S, Coury A: Umbilical artery velocimetry in multiple pregnancy. *Clin Obstet Gynecol* 1989 Dec;32(4):687-91 (20 ref.)

Farrer LA see **St George-Hyslop PH**

Feichtinger W, Breitenecker G, Fröhlich H:

Prolongation of pregnancy and survival of twin B after loss of twin A at 21 weeks' gestation.

Am J Obstet Gynecol 1989 Oct;161(4):891-3

At 21 weeks' gestation premature rupture of the membranes led to unavoidable delivery of an immature first twin (390 gm) who died shortly after birth. The placenta was left undisturbed. Twin B was confirmed to be alive within an intact second sac. Directly after delivery of twin A tocolysis was begun and cervical cerclage was undertaken. Pregnancy was successfully prolonged, which enabled the second fetus to remain in utero and grow for another 12 weeks. Onset of active labor resulted in delivery of a healthy 1750 gm female infant at the beginning of 33 weeks' gestation. The neonatal care was benign and the infant left the hospital in excellent condition after 4 weeks. The case is presented in detail and discussed with respect to the aggressive approach undertaken to prolong gestation.

AUTHOR SECTION

- Ferencz C** see **Berg KA**
Fernández H, Broussain MT, Bertoglio JC, Zamorano P, Ríos R: Infectoepidemiologic and immunologic implications of *Campylobacter coli* enteritis in one newborn monozygotic twin pair. *Arq Gastroenterol* 1989 Jan-Jun;26(1-2):28-32
 Since campylobacter infections in humans at early age have not been thoroughly documented yet, it seemed interesting to report the occurrence of two simultaneous cases of *C. coli* enteritis in one newborn monozygotic twin pair. Their clinical history, epidemiology and microbiological analysis, development of specific serum and mucosal immunity as well as total Ig synthesis are discussed on the basis of their close genetic and environmental relationships.
- Fernández R** see **Quiroz VH**
Filly RA, Goldstein RB, Callen PW: Monochorionic twinning: sonographic assessment. *AJR Am J Roentgenol* 1990 Mar;154(3):459-69 (49 ref.)
Fishel S, Antinori S, Jackson P, Johnson J, Lisi F, Chiariello F, Versaci C: Twin birth after subzonal insemination [letter] *Lancet* 1990 Mar 24; 335(8691):722-3
Fisher AG see **Ghio AJ**
Fisher JE, Siongco A: Complications from in utero death of a monozygous co-twin. *Pediatr Pathol* 1989;9(6):765-71
Fox TM, Mason DE: Identical achondroplastic twins born to normal parents: a case report and review of the literature. *Del Med J* 1989 Nov;61(11):603-7 (14 ref.)
Fraser D see **Picard R**
Friberg LT see **Bergeman CS**
Fröhlich H see **Feichtinger W**
Fukuda I see **Jikuya T**

G

- Gabrielli S** see **Winn HN**
Gatz M see **Pedersen NL**
Ghio AJ, Crapo RO, Elliott CG, Adams TD, Hunt SC, Jensen RL, Fisher AG, Afman GH: Heritability estimates of pulmonary function. *Chest* 1989 Oct; 96(4):743-6
 To test the hypothesis that there is genetic control of pulmonary function parameters independent of that influencing height, we evaluated 74 pairs of asymptomatic, nonsmoking twins. FVC, FEV1, FEF25-75%, TLCsb, RVsb, Dsb, and D/VA were measured. Pulmonary function indices were adjusted for height using simple linear regression. Mean intrapair differences (unadjusted and adjusted for height) were compared using t tests of independent samples. Within pair, Holzinger's, and Falconer's heritability estimates were calculated using height-adjusted residual values. When total variances of a function parameter were statistically different between monozygotes and dizygotes, the among component heritability estimate was calculated and used as the best indicator of heritability. Following adjustment for height, no measure of pulmonary function which satisfied the requirements of the analysis was found to be significantly heritable.
Giles WB see **Trudinger BJ**
Gleason MM: Concordant total anomalous pulmonary venous connection in dizygotic twins. *Am Heart J* 1989 Dec;118(6):1338-40 (25 ref.)
Golan A see **Ron-El R**
Goldberg J, True WR, Eisen SA, Henderson WG: A

twin study of the effects of the Vietnam War on posttraumatic stress disorder. *JAMA* 1990 Mar 2; 263(9):1227-32

This study evaluates the impact of military service during the Vietnam era (1965 to 1975) on posttraumatic stress disorder using a sample of 2092 male-male, monozygotic, veteran twin pairs. Data were collected in 1987 using mail and telephone interviews. In 715 monozygotic twin pairs who were discordant for military service in southeast Asia (SEA), posttraumatic stress disorder was found to be strongly associated with military service in SEA. The prevalence of posttraumatic stress disorder was 16.8% in twins who served in SEA compared with 5.0% in co-twins who did not serve in SEA. There was a ninefold increase in the prevalence of posttraumatic stress disorder (95% confidence interval, 4.8 to 17.6), comparing twins who experienced high levels of combat with their co-twin who did not serve in SEA. Our results demonstrate that nearly 15 years following the end of the Vietnam War, there remains a substantially increased prevalence of posttraumatic stress disorder among veterans who served in SEA.

Golden WL, Schneider BF, Gustashaw KM, Jassani MN: Prenatal diagnosis of Turner syndrome using cells cultured from cystic hygromas in two pregnancies with normal maternal serum alpha-fetoprotein. *Prenat Diagn* 1989 Oct; 9(10):683-9

In two cases of prenatally detected cystic hygroma with oligohydramnios, successful cytogenetic diagnosis of Turner syndrome was achieved using cells obtained from direct aspiration of the cystic hygroma. Exceptionally high levels of alpha-fetoprotein were found in the cystic hygroma fluid, as might be expected. However, the maternal serum alpha-fetoprotein levels were within normal limits. Elevated alpha-fetoprotein levels in 'amniotic fluid' noted previously in the literature may have resulted because of inadvertent tapping of the cystic hygroma. It is clear from our cases that maternal serum levels of alpha-fetoprotein will not necessarily be elevated and will not serve as a screening mechanism for cystic hygromas.

Goldstein RB see **Filly RA**

Gonsoulin W, Copeland KL, Carpenter RJ Jr, Hughes MR, Elder FF: Fetal blood sampling demonstrating chimerism in monozygotic twins discordant for sex and tissue karyotype (46,XY and 45,X). *Prenat Diagn* 1990 Jan;10(1):25-8

Fetal blood sampling has been used in the genetic work-up of twin gestations for rapid karyotyping. We present a case of twins which on ultrasound evaluation revealed hydrops fetalis in one twin and a normal second twin. Fetal blood sampling revealed the presence of mosaicism for 46,XY/45,X in both twins. HLA antigen testing showed the twins to be identical. The patient elected pregnancy termination. Blood chromosomal analysis after delivery revealed both twins to have 46,XY/45,X mosaicism, but the twin with signs of hydrops fetalis had tissue chromosomes of 45,X and the normal twin had tissue chromosomes of 46,XY. Amniotic fluid chromosomal analysis revealed 46,XY in twin A and 45,X in twin B. This represents a case of identical (monozygotic) twins with sex discordance. In this case, there was the probable occurrence of post-zygotic chromosomal non-disjunction leading to the discordancy of the sex in this set of twins. With the presence of vascular communication in monozygotic twins, there is the possibility of exchange of blood in monozygotic twins and the

AUTHOR SECTION

- result of blood chimerism in twins.
- Goodman R, Stevenson J:** A twin study of hyperactivity--II. The aetiological role of genes, family relationships and perinatal adversity. *J Child Psychol Psychiatry* 1989 Sep;30(5):691-709
In a large representative sample of 13-year-old twins, monozygotic pairs were more alike than same-sex dizygotic pairs on objective measures of attentiveness and on parent and teacher ratings of hyperactivity. Comparison of recognized and unrecognized monozygotic pairs indicated that parents and teachers rated twins more similarly when the twins were perceived as "identical" rather than "non-identical". After allowing for this stereotyping, genetic effects accounted for approximately half of the explainable variance of hyperactivity and inattentiveness. Data from mixed-sex pairs did not support a 2-threshold genetic explanation for the male excess of hyperactivity. The link between adverse family factors and hyperactivity was weak. Perinatal adversity was not related to later hyperactivity.
Goto S see Takahashi H
- Gottesman II, Bertelsen A:** Confirming unexpressed genotypes for schizophrenia. Risks in the offspring of Fischer's Danish identical and fraternal discordant twins. *Arch Gen Psychiatry* 1989 Oct;46(10):867-72
Margit Fischer reported in 1971 that the risk of schizophrenia in the offspring of her Danish schizophrenic monozygotic twins and their normal cotwins was equal and not different from the risks in the children of schizophrenics in the literature. All of her identical and fraternal twins who had children and all of their offspring have been followed up through the Danish National Psychiatric Register as of 1985, some 18 years after study by Fischer. The morbid risk (age-corrected) for schizophrenia and schizophrenia-related disorders in the offspring of schizophrenic identical twins is 16.8%; it is 17.4% in their normal cotwins' offspring. The risks in the offspring of schizophrenic fraternal twins and their normal cotwins are 17.4% and 2.1%, respectively. The results suggest that discordance in identical twins may primarily be explained by the capacity of a schizophrenic genotype or diathesis to be unexpressed unless it is released by some kinds of environmental, including nonfamilial, stressors. Sporadic cases and phenocopies caused by cerebral abnormalities, diseases, or viruses would thus be deemphasized as necessary or sufficient explanatory causes for schizophrenia in our study but could account for some of the remaining discordance, infrequent phenocopies should encourage linkage researchers, but unexpression of genotypes will frustrate them.
- Goudsouzian N:** Dose-response to pancuronium in identical twins. *Acta Anaesthesiol Scand* 1990 Jan; 34(1):72-4
The dose-response to pancuronium was determined in identical twins within an hour with the same anesthetic technique. The dose-response curves did not differ from parallelism, but one infant was more sensitive to pancuronium than the other. The recovery rates were also different. The variation in the dose response to pancuronium seems to extend to identical twins.
- Gounder DS, Pullon HW, Ockelford PA, Nicol RO:** Clinical manifestations of the thrombocytopenia and absent radii (TAR) syndrome. *Aust N Z J Med* 1989 Oct;19(5):479-82
Six patients with the classical features of the TAR syndrome were diagnosed at birth. In one case an older sibling was also affected. The characteristic features of foreshortened forearms and radially deviated hands were noted in all cases at presentation and confirmed radiologically. With one exception skeletal abnormalities of the lower limbs were also present. Varying degrees of thrombocytopenia were present at birth with three of the five patients having platelet counts below $50 \times 10^9/L$. Bone marrow examination was performed in two patients and revealed an absence of normal megakaryocytes. Two patients with severe thrombocytopenia had bleeding complications during infancy requiring transfusion support. Severe gastroenteritis occurred in two patients, in one of whom it was attributed to cow's milk intolerance. In all patients the platelet count has risen progressively since birth. Orthopedic surgical procedures have been performed without hemorrhagic complications.
- Gracia R** see Martínez-Urrutia MJ
Graudal HK see Tarp U
- Grayson DA:** Twins reared together: minimizing shared environmental effects. *Behav Genet* 1989 Jul; 19(4):593-604
The assumption that genetic variance is primarily (if not all) additive is usually made in biometric-genetic analyses of data collected on twins raised together. It is known amongst those familiar with twin methods that this assumption may lead to overestimates of heritability and under-estimates of shared environmental variance (E2), although this limitation is not always made clear to genetically native readers of such applications. The concept of "emergent" genetic mechanisms (a potentially extreme epistatic or nonadditive mechanism) discussed by Lykken (1982) raises the possibility that genetic variance may be substantially nonadditive in some applications. The aims of the present paper are to investigate the potential size of such nonadditivity and such misestimations and to provoke discussion on the empirical plausibility (or otherwise) of epistatic effects. For if substantially present, the results of conventional twin analyses are substantially biased.
- Greco MA, Kamat BR, Demopoulos RI:** Placental protein distribution in maternal diabetes mellitus: an immunocytochemical study. *Pediatr Pathol* 1989; 9(6):679-90
Placentas associated with maternal diabetes are generally characterized by features of villous immaturity. We correlated the villous histology with the immunocytochemical distribution of four trophoblastic proteins: beta human chorionic gonadotropin (beta HCG), placental alkaline phosphatase (PLAP), pregnancy specific beta-1-glycoprotein (SP1), and human placental lactogen (HPL) in 14 third-trimester placentas associated with diabetes mellitus. Staining was increased for beta HCG and decreased for PLAP, SP1, and HPL in the diabetic placentas compared to control placentas of similar gestational age. This pattern was most prominent in areas of marked architectural villous immaturity within individual placentas and suggests concomitant functional immaturity.
- Gregor A** see Hardman PD
Griffiths ID see Deighton CM
Groenendaal F see Mulder AF
- Grover V, Chawla R, Mishra SL:** Management of conjoined twins. *Int J Gynaecol Obstet* 1990 Jan; 31(1):67-9
A case of thoracopagus conjoined twins encountered in the second stage of labor is presented. Delivery was possible by the vaginal route after reducing the fetal bulk by destructive operations. Problems in

AUTHOR SECTION

obstetric management of these cases are discussed and the importance of proper antenatal evaluation is stressed.

Gusella JF see **St George-Hyslop PH**

Gustashaw KM see **Golden WL**

H

Hagay ZJ see **Picard R**

Haines JL see **St George-Hyslop PH**

Halliday D see **Thompson GN**

Hampson S see **Lynn R**

Hancock BJ, Wiseman NE, Rusnak BW: Bile duct stricture in an infant with gastroschisis treated by percutaneous transhepatic drainage, biliary stenting, and balloon dilation. *J Pediatr Surg* 1989 Oct; 24(10):1071-3

A newborn twin with an antenatal diagnosis of gastroschisis underwent staged repair of the abdominal wall defect. She developed multiple fistulae due to ischemic bowel and then abdominal wall dehiscence requiring additional surgical interventions. Obstructive jaundice, first evident at 3 weeks of age, became progressively severe. A stricture of the common bile duct was diagnosed by percutaneous transhepatic cholangiography. The stricture was treated by percutaneous biliary drainage, biliary stenting, and balloon dilation of the common bile duct. These procedures, commonly used in adults for biliary decompression, may be useful alternatives to surgical intervention in infants and children with obstructive jaundice due to bile duct stricture.

Hardman PD, Bell J, Whittle IR, Gregor A: Familial glioma: a report of glioblastoma in identical twins and oligo-astrocytoma in siblings.

Br J Neurosurg 1989;3(6):709-15 (17 ref.)

The authors report two pairs of siblings who had intracranial gliomas. One pair of identical twins had glioblastomas and two siblings had mixed oligo-astrocytomas. Genetic influences in the aetiology of glioma are discussed.

Harshfield GA see **Swan GE**

Hasegawa N see **Jikuya T**

Hastie SJ, Danskin F, Neilson JP, Whittle MJ:

Prediction of the small for gestational age twin fetus by Doppler umbilical artery waveform analysis. *Obstet Gynecol* 1989 Nov;74(5):730-3

In 89 consecutive twin pregnancies, monthly Doppler ultrasound measurements were made of the umbilical artery blood flow velocity waveforms of each fetus. In total, 453 Doppler studies were performed. Of the 178 infants, 32 were small for gestational age (SGA); only 24 of the 82 SGA Doppler studies were abnormal, giving an overall sensitivity of the test in the prediction of the SGA fetus of 29% and a positive predictive value of 34%. Furthermore, neither the sensitivities nor the positive predictive values were above 50% in any of the gestational-age intervals individually studied. We conclude that Doppler study of umbilical artery flow velocities is not of much value in the prediction of SGA infants in twin pregnancies, although persistently absent end-diastolic velocities were associated with poor outcome.

Hauspie R see **Linkowski P**

Heath AC, Martin NG: Psychoticism as a dimension of personality: a multivariate genetic test of Eysenck and Eysenck's psychoticism construct.

J Pers Soc Psychol 1990 Jan;58(1):111-21

In this study, we applied multivariate genetic analysis, a generalization of factor analysis and

behavior genetic analysis, to responses to items of the Psychoticism scale of the Eysenck Personality Questionnaire by 2,903 adult same-sex Australian twin pairs. Item loadings on genetic, shared environmental, and nonshared environmental common and specific factors were estimated. The genetic factor structure differed considerably from the environmental structures, particularly in men. The genetic correlation between suspiciousness items and items reflecting unconventional or tough-minded attitudes or hostility to others was negative, but the environmental correlation was positive. Thus, conventional behavior genetic studies that have reported significant heritability of psychoticism, on the basis of analyses of scale scores, are misleading as to what trait is being inherited.

Heaton DA, Lazarus NR, Pyke DA, Leslie RD: B-cell responses to intravenous glucose and glucagon in non-diabetic twins of patients with type 1 (insulin-dependent) diabetes mellitus. *Diabetologia* 1989 Nov;32(11):814-7

The B-cells of patients with recently diagnosed Type 1 (insulin-dependent) diabetes may have no response to glucose when the response to glucagon is present but attenuated. This observation suggests that the recognition of glucose is more severely affected than that for non-glucose stimulants. To determine whether a similar selective decrease in glucose response was present before the onset of diabetes we studied two groups of non-diabetic identical twins of patients with recently diagnosed Type 1 diabetes: one group with complement-fixing islet cell antibodies who were at high risk of developing diabetes (four of the five have already developed diabetes) and a group without such antibodies at low risk of developing diabetes. In addition, a group of patients with chronic pancreatitis were studied to control for non-specific damage to the B-cell. Responses to i.v. glucose and i.v. glucagon were compared. Patients with chronic pancreatitis has similar responses to both glucose and glucagon and the responses did not differ from control subjects. The B-cells of the immune positive group showed evidence of pathology because the insulin and C-peptide responses to both stimuli were reduced when compared to either their control subjects or the immune negative twin group.

However, the B-cell response to both glucose and glucagon in the immune positive twins was similar. Because the B-cell response to glucose was not less than that to glucagon, a selective destruction of the glucose recognition system cannot be a characteristic of all twins throughout the period before they develop Type 1 diabetes.

Heikkilä JK, Koskenvuo M, Heliövaara M, Kurppa K, Riihimäki H, Heikkilä K, Rita H, Videman T: Genetic and environmental factors in sciatica. Evidence from a nationwide panel of 9365 adult twin pairs. *Ann Med* 1989 Oct;21(5):393-8

The relative roles of genetic and environmental factors in sciatica were studied in the nationwide Finnish twin panel consisting of 9365 adult pairs of the same gender. Morbidity was analysed from two sources of data: the life-long cumulative incidence was measured by a postal questionnaire, and the rate of hospital admission during a 14-year period was measured by record-linkage of the twin panel and the nationwide hospital registry. Altogether 2220 individuals reported sciatica diagnosed by a doctor and 304 were admitted to hospital with a diagnosis of sciatica. The proportion of concordant pairs (calculated from affected pairs) was 17.7% for monozygotic and 12.0% for dizygotic pairs in the

AUTHOR SECTION

life-long cumulative incidence of reported sciatica, and correspondingly 4.6% and 1.9% for those admitted to hospital (a 14-year period) because of sciatica. The estimated heritability was 20.8% for those with reported sciatica and 10.6% for those admitted to hospital. The results show that environmental factors account for more than 80% of the etiology of sciatica, and more than 90% in the case of patients admitted to the hospital. Genetic factors, however, were relatively more significant in individuals under 40.

Heikkilä K see **Heikkilä JK**

Heliövaara M see **Heikkilä JK**

Henderson AH see **Lewis NP**

Henderson AS see **Creasey H**

Henderson WG see **Goldberg J**

Herman A see **Ron-El R**

Heston LL see **Segal NL**

Hewitt JK: Of biases and more in the study of twins reared together: a reply to Grayson.

Behav Genet 1989 Jul;19(4):605-8

Grayson (see the preceding paper) discusses some circumstances in which estimates of genetic and environmental parameters derived from the study of twins reared together may be biased and documents in those circumstances what the magnitude of the biases may be. As Grayson suggests, the points he makes have been made previously by various authors and issues such as the power to detect dominance have been analyzed at some length. This paper draws attention to some other sources of variation which Grayson does not consider but which have been considered by other writers and which might have somewhat different consequences for the estimation of shared environmental effects. The classical twin study has never been an end in itself, but it is the nucleus of a systematic genetic approach to the study of human behavior.

Hewitt JK see **Moskowitz WB**

Hewitt JK see **Schieken RM**

Hobbins JC see **Winn HN**

Hoffman EP see **Richards CS**

Hop W see **Oudsluys-Murphy AM**

Houston AB see **Reid JM**

Howald H see **Amato M**

Hoyle RM, Thomas CG Jr: Twenty-three-year follow-up of separated ischiopagus tetrapus conjoined twins. *Ann Surg* 1989 Nov;210(5):673-9 (44 ref.)

This paper presents a 23-year follow-up of the separation of ischiopagus tetrapus conjoined twins reported in *Annals of Surgery* in December 1966. One twin died of septicemia at age 2 years after bilateral pelvic osteotomies for the treatment of her marked pelvic diastasis. The surviving twin has done reasonably well, and her most significant problem is related to her musculoskeletal system. She has an increasing T7-10, L-1 apex right congenital scoliosis with wedged vertebra at T-10, as well as marked pubic diastasis and bilateral subluxation of her hips. This has resulted in a somewhat aberrant physical appearance and a "waddling" gait. Her colostomy functions well and she has normal renal and bladder function. This patient's history illustrates that many problems remain after successful separation of conjoined twins. However these problems are manageable and do not preclude the possibility that such a patient may be a productive member of society.

Hughes MR see **Gonsoulin W**

Hunt SC see **Ghio AJ**

Hüppi P see **Amato M**

Hwang FY see **Chen WJ**

I

Imaizumi Y: Stillbirth rate and weight at birth of quintuplets in Japan.

Acta Genet Med Gemellol (Roma) 1989; 38(1-2):65-9

Nation-wide data in Japan on births and prenatal deaths of 16 sets of quintuplets during 1974-1985 were analysed. Among the 16 sets, 3 sets were liveborn, 8 were stillborn, and 5 were mixed, with a stillbirth rate of 0.64 (51/80). Effects of sex, maternal age and birth order on the stillbirth rate were not considered because of the small sample size. Effects of gestational age and birthweight on stillbirth rate were also examined. The mean weight of the 40 quintuplet individuals was 1,048 g.

Iqbal S see **Vohra K**

Ismail MA see **Baron BW**

J

Jacklin CN see **Mitchell JE**

Jackson P see **Fishel S**

Jacobsen P see **Tandan R**

James MF see **St George-Hyslop PH**

Jamison PL, Meier RJ, Thompson-Jacob D: Meaning of biodistance statistics: a test case using adult monozygotic twins. *Am J Phys Anthropol* 1989 Dec; 80(4):485-92

Anthropometry, historically one of the primary research techniques in physical anthropology, has been widely utilized in biodistance studies. The complex genetic and environmental interaction that governs the expression of anthropometric dimensions, together with concerns over measurement error, have sometimes clouded the interpretation of biodistances based upon anthropometry. In this study, 51 pairs of adult monozygotic twins were analysed using discriminant analysis and Mahalanobis' generalized distance. Both male and female twins, grouped by first- versus second-born, displayed very small, statistically insignificant distances between groups. When literature estimates of intra-observer measurement errors were used as a frame of reference, the average absolute differences between the twin pairs were approximately twice the size of the measurement error estimates. The results of this study suggest that, first, the environmental effect upon the genetically influenced traits measured by anthropometry is not large enough to bring about significant multivariate differences between identical twin pairs; and, second, biodistance studies based upon anthropometry can be reliable so long as measurement error is minimized.

Jassani MN see **Golden WL**

Jensen RL see **Ghio AJ**

Jhaveri R see **Vohra K**

Jikuya T, Fukuda I, Hasegawa N, Nakajima H: Popliteal artery entrapment syndrome of the monozygotic twin—a case report and pathogenetic hypothesis. *Jpn J Surg* 1989 Sep;19(5):607-11

A 22 year old Japanese man with popliteal artery entrapment syndrome in which both popliteal arteries were segmentally occluded and deviated medially, underwent surgical treatment by grafting and patching with autologous veins. His identical co-twin was also found to have a less severe form of popliteal artery entrapment syndrome. This is the first report of popliteal artery entrapment syndrome

AUTHOR SECTION

presenting in a pair of monozygotic twins and the concordance of the syndrome suggests that genetic factors may play a part in the development of this rare syndrome.

Johnson J see **Fishel S**

Johnson VP, Vidgoff J, Wilson N, Madison D: Alpha-fetoprotein and acetylcholinesterase in twins discordant for neural tube defect. *Prenat Diagn* 1989 Dec;9(12):831-7 (15 ref.)

Twins concordant for elevated alpha-fetoprotein (AFP) and acetylcholinesterase (AChE) and discordant for neural tube defect (NTD) and sex are reported. A literature review reveals instances of termination of twin pregnancies with one normal and one abnormal fetus, partly based on concordant high AFP and positive AChE (although discordant on ultrasound examination). The levels of AFP and AChE in twin pregnancies are probably a function of the number of layers of fetal membranes separating twin sacs; dichorionic, diamniotic membranes allow transfer of AFP; monochorionic, diamniotic membranes allow transfer of both AFP and AChE. Cautious interpretation of biochemical findings and reliance on high resolution ultrasonography are suggested.

Jorm A see **Creasey H**

Jovanovic V see **Ristanovic D**

Juntunen J, Kinnunen E, Antti-Poika M, Koskenvuo M: Multiple sclerosis and occupational exposure to chemicals: a co-twin control study of a nationwide series of twins. *Br J Ind Med* 1989 Jun;46(6):417-9
From the Finnish Twin Cohort (n = 27,100 pairs with known zygosity) all cases of diagnosed multiple sclerosis (MS) were reviewed and those with clinically verified MS were invited for further examinations at the Institute of Occupational Health, Helsinki, with their co-twins. Twenty one cases (19 pairs, of which 17 were discordant) fulfilled the strict criteria of MS. Detailed occupational history showed exposure to a mixture of solvents in six subjects, to lead in one, and to trichloroethylene in one. Of these seven, two monozygotic twins had MS whereas the other five cases were healthy co-twins. These results do not support a causal association between occupational exposure to chemicals and the aetiopathogenesis of MS.

K

Kamat BR see **Greco MA**

Kanakas N, Boos R, Schmidt W: Twin pregnancy in the right horn of a uterus didelphys: a case report. *Eur J Obstet Gynecol Reprod Biol* 1989 Sep;32(3):287-92

A rare case of a twin pregnancy occurring in the right horn of a uterus didelphys (double uterus, double cervix and septate vagina) is reported. The occasional diagnosis of this uterine anomaly was made after the pregnancy was detected. Both embryos, with cardiac actions which proved the viability of the gestation from the very early stage of pregnancy, were detected by transvaginal ultrasonography. Two male infants were delivered by Cesarean section in the 34th week. The importance of the transvaginal sonography and the handling of the case during this high-risk pregnancy are reported.

Kanner RE see **Nelson P**

Kaprio J, Koskenvuo M: Twins, smoking and mortality: a 12-year prospective study of smoking-discordant twin pairs. *Soc Sci Med* 1989;29(9):1083-9
Despite the increasing scientific evidence for a causal

role of tobacco smoking in lung cancer and coronary heart disease, critics, several decades ago, put forward an alternative hypothesis. The constitutional hypothesis has stated that there are genetic or other common factors, which predispose both to smoking and disease, but that the two are not causally related. A critical test of this hypothesis is the study of disease in monozygotic (MZ) twin pairs in which one smokes and the other never has. Earlier twin studies found only small differences in the mortality of smoking and nonsmoking twins of discordant pairs. In the Finnish Twin Cohort, a population-based panel of adult like-sexed twin pairs, a questionnaire study carried in 1975 permitted identification of twin pairs discordant for cigarette smoking. The nonsmoking cotwins had never been regular smokers. The smoking twins were divided into 1278 current smokers [CS; 143 MZ and 598 dizygotic (DZ) males and 171 MZ and 585 DZ females] and 1210 former smokers (FS; 129 MZ and 408 DZ males and 113 MZ and 341 DZ females). Exposure to tobacco was much higher among males; over 25% of men smoked 20 or more cigarettes daily compared to less than 10% of women. Follow-up of mortality yielded data on time and cause of death. Analyzing on first deaths from concordant pairs, there were 13 deaths in the smokers of male CS MZ pairs and 1 death in the nonsmoking cotwins (relative risk = 13.0, P less than 0.01). Excess mortality was also found for male CS DZ smokers (RR = 2.43, P less than 0.01).(ABSTRACT TRUNCATED AT 250 WORDS)

Kaspárek J see **Steidl L**

Katz KS see **Richards CS**

Kela E see **Takala AK**

Kerkhofs M see **Linkowski P**

Kierulf P see **Berg K**

Kinnunen E see **Juntunen J**

Knisely AS: Thanatophoric dysplasia in identical twins [letter; comment] *J Med Genet* 1989 Nov;26(11):735-6

Kobayashi M see **Takahashi H**

Koçak AK see **Kural N**

Kochenour NK see **Warenski JC**

Kock KE see **Elberg JJ**

Koetsier JC see **Uitdehaag BM**

Kollée LA see **Caglar MK**

Korsak VS: Incidence and some perinatal problems of multiple pregnancies in a central referral hospital, Addis Ababa. *Ethiop Med J* 1989 Oct;27(4):217-21
This survey covers 41,645 deliveries registered in St. Paul's Hospital, Addis Ababa (one of the 6 central referral hospitals of Ethiopia), from 1971 to 1985, with multiple deliveries comprising 2.5% of all the cases. The results obtained from analysis of these data revealed that twins occurred in the ratio of 1:41 deliveries, and triplets in 1:41(2) deliveries, this is in conformity with Hellin's statement, made in 1895. The occurrence of multiple delivery in multigravidae is shown as 1.62 times greater than that in primigravidae. There was a male predominance (52.1%) among twins. Discordant twins and triplets were observed in 31.5% and 50% respectively. In 55.9% of twin deliveries, both twins had a birthweight of less than 2500g. Head presentation of both twins occurred in 40% of the multiple births. Operative delivery was undertaken in 12.4% of all the cases.

Koskenvuo M see **Antero Kesäniemi Y**

Koskenvuo M see **Heikkilä JK**

Koskenvuo M see **Juntunen J**

Koskenvuo M see **Kaprio J**

Kringlen E, Cramer G: Offspring of monozygotic twins

AUTHOR SECTION

- discordant for schizophrenia.
Arch Gen Psychiatry 1989 Oct;46(10):873-7
- We studied the incidence of psychopathologic disorder in offspring of monozygotic twins discordant for schizophrenia. The original material was based on a complete national sample of twins who were hospitalized for functional psychosis in Norway. A comparison of adult offspring of schizophrenic monozygotic twins with offspring of their nonpsychotic cotwins showed that although there are more schizophrenic and schizophreniclike cases in the first group, an observation that may be ascribed to environmental factors, the difference is not statistically significant.
- Kunkel LM** see **Richards CS**
- Kural N, Tekin N, Koçak AK, Oner U:** Meckel syndrome in twins. Turk J Pediatr 1989 Jan-Mar; 31(1):79-82
- Meckel syndrome in twins is presented. Although several families have been reported as having this syndrome in more than one member, this is the first instance that twins having this disorder have been reported. We wish to emphasize the importance of genetic counselling in such a case in which prenatal diagnosis is possible.
- Kurppa K** see **Heikkilä JK**
- L**
- Lamb JT** see **Cundall DB**
- Lassaletta L** see **Martínez-Urrutia MJ**
- Layton WM:** Situs inversus in conjoined twins [letter; comment] Am J Med Genet 1989 Oct;34(2):297
- Lazarus NR** see **Heaton DA**
- Lee YS** see **Seo JW**
- Lefvert AK, Pirskanen R, Eng H, Sundewall AC, Swanborg E:** B cell and autoantibody repertoire in a pair of monozygotic twins discordant for myasthenia gravis. Clin Immunol Immunopathol 1989 Nov;53(2 Pt 1):161-70
- A pair of identical twins, 47 years of age, who have been discordant for myasthenia gravis for 15 years were studied with regard to clinical status, neuromuscular function, and presence and properties of myasthenia specific autoantibodies. The autoantibody repertoire was tested in serum, as produced by peripheral lymphocytes in culture and as revealed by B cell lines. The healthy twin had no clinical signs of myasthenia and no signs of impaired neuromuscular function on electrophysiological tests. The autoantibody repertoire and the avidity of the anti-receptor antibodies were similar in both individuals. Epstein-Barr virus transformation of peripheral lymphocytes revealed a higher incidence of B cells committed to make autoantibodies in the healthy twin than in her myasthenic sister.
- Leiberman JR** see **Picard R**
- Leon S** see **Offringa PJ**
- Leslie RD** see **Heaton DA**
- Lewis NP, Henderson AH:** Calcific aortic stenosis in twins: a clue to its pathogenesis? Eur Heart J 1990 Jan;11(1):90-1
- A pair of identical twins presented almost simultaneously at age 62 years with calcific aortic stenosis requiring surgery, one with bicuspid and one with tricuspid aortic valve. This suggests that bicuspid morphology may perhaps not be the cause, but may be a genetically linked marker of an inherited predisposition to calcific stenosis.
- Lineaweaver WC** see **Valauri FA**
- Linkowski P, Kerkhofs M, Hauspie R, Susanne C, Mendlewicz J:** EEG sleep patterns in man: a twin study. Electroencephalogr Clin Neurophysiol 1989 Oct;73(4):279-84
- All-night EEG sleep recording was performed for 3 consecutive nights in 26 pairs of normal male twins (14 monozygotic and 12 dizygotic) in order to investigate genetic components of sleep. The analysis was based on average values of repeated sleep measures and controlled for the effect of cohabitation. Our results indicate that a significant proportion of variance in stages 2, 4 and delta sleep as well as in REM density is genetically determined in man. Genetic influences on stage 1 and REM are strongly confounded by a synchronizing effect of the cohabitational status.
- Lisi F** see **Fishel S**
- Little J, Nevin NC:** Congenital anomalies in twins in Northern Ireland. III: Anomalies of the cardiovascular system, 1974-1978. Acta Genet Med Gemellol (Roma) 1989; 38(1-2):27-35
- Rates of congenital anomalies of the cardiovascular system were compared between twins and singletons in a population-based study in Northern Ireland during the period 1974-1978. Multiple sources of ascertainment were used. As in previous studies, the rate of anomalies of the cardiovascular system in twins (91.0/10,000) was higher than the rate in singletons (66.4/10,000). The excess was confined to twins from pairs of like sex and, in the main, anomalies of the circulatory system other than of the heart itself were involved. Problems in the interpretation of this excess are discussed. No twins were concordant for congenital cardiovascular anomalies of any type.
- Little J, Nevin NC:** Congenital anomalies in twins in Northern Ireland. I: Anomalies in general and specific anomalies other than neural tube defects and of the cardiovascular system, 1974-1979. Acta Genet Med Gemellol (Roma) 1989; 38(1-2):1-16
- Data are presented from a large-scale population-based study in Northern Ireland, in which multiple sources of ascertainment were used. As found in other studies, the overall prevalence at birth of congenital anomalies amongst twins (285.4/10,000) was somewhat higher than the rate amongst singletons (241.8/10,000). Unlike in other studies, however, the rate amongst twins of like sex (287.8/10,000) was not markedly higher than that amongst twins of unlike sex (252.3/10,000). Problems of comparison between series are discussed.
- Little J, Nevin NC:** Congenital anomalies in twins in Northern Ireland. II: Neural tube defects, 1974-1979. Acta Genet Med Gemellol (Roma) 1989; 38(1-2):17-25
- In a large population-based study in Northern Ireland during the period 1974-1979, the rate of anencephalus in twins (9.1/10,000) was found to be less than that in singletons (24.3/10,000). This finding is in contrast with most other studies and the possibility of underascertainment of twin cases is considered, but it is concluded that chance is the likeliest explanation. The rate of spina bifida in twins (36.4/10,000) was similar to that in singletons (31.9/10,000). All of the twins with anencephalus were female and from pairs of like sex. Rates of spina bifida in twins from pairs of the two sex types were similar but, unusually, there was a male preponderance. As in previous studies, the great majority of twins with NTDs had unaffected cotwins.
- Liu TK** see **Chen WJ**

AUTHOR SECTION

Loehlin JC: Partitioning environmental and genetic contributions to behavioral development.

Am Psychol 1989 Oct;44(10):1285-92 (31 ref.)

Long DM see **Cameron DE**

Longley W see **Creasey H**

López Pereira P see **Martínez-Urrutia MJ**

Lucas A see **Morley R**

Lucas CJ see **Uitdehaag BM**

Ludmir J, Samuels P, Armson BA, Torosian MH:

Spontaneous small bowel obstruction associated with a spontaneous triplet gestation. A case report.

J Reprod Med 1989 Dec;34(12):985-7

Spontaneous bowel obstruction in pregnancy is a rare event and usually associated with a prior history of surgical procedures or infection. Its symptoms can mimic physiologic changes in pregnancy or preterm labor. We treated a woman who had a triplet gestation and whose lack of predisposing factors delayed the diagnosis of obstruction. The patient delivered prematurely at 22 weeks and required surgery to alleviate the obstruction. The possibility of intestinal obstruction should be entertained in any pregnant woman presenting with nausea, vomiting and an overdistended uterus.

Lundmark E see **Reid JM**

Luterman A see **Powell RW**

Lynn R, Hampson S, Agahi E: Genetic and environmental mechanisms determining intelligence, neuroticism, extraversion and psychoticism: an analysis of Irish siblings. Br J Psychol 1989 Nov;80 (Pt 4):499-507

The theory that shared family environment has an effect on intelligence but no effect on personality was examined by a study of correlations between young adolescent Irish siblings for intelligence, neuroticism, extraversion and psychoticism. The correlations obtained for 386 sibling pairs were 0.48 (intelligence), 0.06 (neuroticism), 0.31 (extraversion) and 0.14 (psychoticism). The correlation for IQ confirms the operation of both genetic and shared family effects on intelligence. The low correlations for neuroticism and psychoticism confirm the thesis that shared family effects have no influence on these traits. They are also inconsistent with an additive genetic model and suggest that non-additive genetic mechanisms are present to make siblings so dissimilar. The higher sibling correlation for extraversion suggests that shared family environment does have some effect on this trait among young adolescents and is also consistent with an additive genetic model.

M

McClearn GE see **Bergeman CS**

McClearn GE see **Plomin R**

Machin GA see **Siebert JR**

Mackenzie JW: Recovery from two different intravenous induction techniques in identical twins [letter] Anaesthesia 1990 Jan;45(1):69

Madison D see **Johnson VP**

Mäkelä M see **Takala AK**

Martin NG see **Heath AC**

Martínez-Urrutia MJ, López Pereira P, Lassaletta L, Gracia R, Utrilla J: Abdominal mass: "fetus in fetu". Acta Paediatr Scand 1990 Jan;79(1):121-2

A female newborn presented a mass in the left upper abdominal quadrant. It was removed by surgery and contained two independent fetuses. Dissection and radiological study of the fetuses showed an axial skeleton and long bones. It corresponds to the generally recognized diagnostic criteria of fetus in

fetu.

Martinovic Z see **Ristanovic D**

Mason DE see **Fox TM**

Maxwell LG see **Cameron DE**

Meier RJ see **Jamison PL**

Mendlewicz J see **Linkowski P**

Mercado M see **Quiroz VH**

Mesogitis S see **Farmakides G**

Metzker A see **Waisman Y**

Miettinen TA see **Antero Kesäniemi Y**

Milsark IW see **Richards CS**

Mishra SL see **Grover V**

Mitchell JE, Baker LA, Jacklin CN: Masculinity and femininity in twin children: genetic and environmental factors. Child Dev 1989 Dec; 60(6):1475-85

Genetic and environmental origins of individual differences in masculine and feminine personality attributes were investigated in a sample of 38 monozygotic and 32 dizygotic twin pairs (total N = 140) during pre- and early adolescence.

Self-report measures of both masculine and feminine characteristics were obtained for each child using 2 standardized instruments: the Children's Personality Attributes Questionnaire (CPAQ) and the Adolescent Self-Perception Inventory (ASPI). Multivariate biometrical analyses revealed significant genetic influences in all measures, accounting for 20%-48% of the observed variation in each.

Environmental influences, which explained the remaining 52%-80% of variance in masculinity and femininity, were apparently specific to each individual and not shared by members of the same twin pair. The results underscore the importance of considering both genetic and environmental factors in gender-role development, particularly in studies of family resemblance.

Monk B: Acropustulosis of infancy in a twin [letter] Clin Exp Dermatol 1990 Jan;15(1):77

Mori T see **Nagao M**

Morley R, Cole TJ, Powell R, Lucas A: Growth and development in premature twins. Arch Dis Child 1989 Jul;64(7):1042-5

A total of 476 infants (386 singletons and 90 twins) born before 32 weeks' gestation were studied to compare long term growth and development in twins and singletons. At 18 months, after adjusting for confounding social, obstetric, and neonatal factors, twins were not disadvantaged in their neurodevelopmental status, but were 1.6 cm shorter than singletons and had thicker triceps and subscapular skinfolds. No significant differences were found between first and second born twins in later growth or development at 18 months post-term. While preterm twins may have an inherent disadvantage in linear growth it is suggested that in other respects twinning is not a risk factor in preterm infants.

Moskowitz WB, Mosteller M, Schieken RM, Bossano R, Hewitt JK, Bodurtha JN, Segrest JP: Lipoprotein and oxygen transport alterations in passive smoking preadolescent children. The MCV Twin Study. Circulation 1990 Feb;81(2):586-92

We investigated the cardiovascular effects of lifelong passive cigarette smoke exposure in preadolescent children and examined the following questions: 1) Is systemic oxygen transport altered? 2) Are coronary heart disease risk factors adversely affected? We recruited 216 families from the MCV Twin Study; 105 had at least one smoking parent. Serum thiocyanate and cotinine levels were used as measures of smoke exposure in the children and thiocyanate was proportional to the number of

AUTHOR SECTION

parental cigarettes smoked each day ($p = 0.0001$). Paternal smoking had no effect on these measures. Whole blood 2,3-diphosphoglycerate was higher in smoke-exposed than unexposed children (p less than 0.01) and was related to the thiocyanate level (p less than 0.02). High density lipoprotein (HDL) cholesterol was lower in passive smoking children (p less than 0.05); the HDL2 subfraction was reduced in passive smoking boys, while the HDL3 subfraction was reduced in passive smoking girls. Significant adverse alterations in systemic oxygen transport and lipoprotein profiles are already present in preadolescent children exposed to long-term passive cigarette smoke, primarily from maternal smoke. Children with long-term exposure to passive smoke may be at elevated risk for the development of premature coronary heart disease.

Moskowitz WB see **Schieken RM**

Mossberg B see **Svartengren M**

Mosteller M see **Moskowitz WB**

Mosteller M see **Schieken RM**

Mulder AF, van Eyck J, Groenendaal F, Wladimiroff

JW: Trisomy 18 in monozygotic twins.

Hum Genet 1989 Oct;83(3):300-1

We report a very rare case of a pair of monozygotic twins with trisomy 18 discordant for major anomalies. Our case contributes to published data on the role of nongenetic factors in the etiology of discordance of congenital malformations in genotypically identical twins. We stress the importance of accurate ultrasonic examination in reducing the number of caesarean sections to deliver trisomy 18 infants.

Mullan M: Alcoholism and the 'new genetics'.

Br J Addict 1989 Dec;84(12):1433-40; discussion 1441-2 (48 ref.)

Molecular biology is transforming our view of psychiatry. For the first time methods are becoming available to detect directly the genetic abnormalities leading to psychiatric illness. This article examines the ways in which the new marker technology might bridge the gap between classical genetic knowledge of alcoholism and the precise identification and localization of specific genes implicated in its aetiology.

Myers RH see **St George-Hyslop PH**

N

Nagao M, Tsuchiyama A, Aoyama T, Mori T, Oyanagi

K: Secondary carnitine deficiency in the newborn period in twins of a mother with partial ornithine transcarbamylase deficiency. *J Pediatr* 1989 Oct; 115(4):611-4

Nahum H see **Ron-El R**

Nakajima H see **Jikuya T**

Nalini P see **Sivasankaran P**

Nance WE: Do twin Lyons have larger spots?

Am J Hum Genet 1990 Apr;46(4):646-8

Nance WE see **Schieken RM**

Neifert M, Thorpe J: Twins: family adjustment,

parenting, and infant feeding in the fourth trimester.

Clin Obstet Gynecol 1990 Mar;33(1):102-13 (36 ref.)

Neilson JP see **Hastie SJ**

Nelson P, Kanner RE: Bullous emphysema in

monozygotic twins. *Am Rev Respir Dis* 1989 Dec;

140(6):1796-9

Monozygotic twins who developed bullous emphysema are described. This occurrence suggests that there is a genetic component that predisposes to the development of this disorder.

Nesselroade JR see **Plomin R**

Nevin NC see **Little J**

Ng H, Tan KP: Foetus--a case report.

Singapore Med J 1989 Oct;30(5):495-501

A three-month old baby presented to the Paediatric Department with a problem of abdominal distension. Clinically, he had a large right abdominal mass which on investigations suggested a teratomatous lesion. At operation, a foetus-like tumour mass was located in the retroperitoneal space. A diagnosis of foetus in foetu was made. A close differential of a retroperitoneal teratoma is discussed and comparison with confirmed cases made.

Nichols DG see **Cameron DE**

Nicol RO see **Gounder DS**

Niermeyer S: Twin neonates: special considerations.

Clin Obstet Gynecol 1990 Mar;33(1):88-101 (46 ref.)

Nitzan M see **Waisman Y**

O

Ockelford PA see **Gounder DS**

O'Donnell JJ see **Teikari JM**

Offringa PJ, Wildschut HI, Tutein Nolthenius-Puylaart

MC, Leon S, Boersma ER: Conjoined twins and

abdominal pregnancy. *Int J Gynaecol Obstet* 1989

Sep;30(1):73-6

Abdominal pregnancy is rare; conjoined twins are

also rare. The diagnosis of abdominal pregnancy is

easily missed and often not made until near full-term.

Similarly conjoined twins are not diagnosed until

late in gestation or during parturition. In this case,

the diagnosis of conjoined twins and abdominal

pregnancy was only made during laparotomy.

Oner U see **Kural N**

Ortmeyer DH: Comments on "On Being a Twin: How

the View May Differ for Each of the Pair," by Lilly

Dimitrovsky, M.D. [letter; comment]

J Am Acad Psychoanal 1989 Winter;17(4):689-90

Oudesluys-Murphy AM, Hop W, de Groot C:

Umbilical cord separation in twins.

Early Hum Dev 1989 Jul;19(4):241-5

In this study of twins it was found that the separation

of the umbilical cord generally occurred earlier in

the first born than in the second born infant. The

times of cord separation of twin members are

correlated and this correlation is stronger than could

be expected by *random pairing*. However, the

correlation was not stronger between monozygotic

twin members than between dizygotic twin

members.

Oyanagi K see **Nagao M**

P

Pearson CG see **Pedersen NL**

Pedersen NL, Gatz M, Winblad B, Pearson CG, Berg

S: Dementias in Swedish twins.

Prog Clin Biol Res 1989;317:217-22

Pedersen NL see **Bergeman CS**

Pedersen NL see **Plomin R**

Pedersen NL see **Segal NL**

Pedersen SA see **Elberg JJ**

Perusse L see **Rice T**

Phillippe P, Roy R: Conceptive delays of twin-prone

mothers: a demographic epidemiologic approach.

Hum Biol 1989 Aug;61(4):599-614

We studied the time interval to the first birth and

to the twin birth using statistical and mathematical

models in two groups of mothers, those with twins

and those with singletons, from the same population.

We made use of a pair-matched case-control design.

We treated the maternal birth cohort and parity as

AUTHOR SECTION

confounders and thus as controlled. We also investigated the sex of twin pairs as an interactive variable, employing such methods as survival curve testing and using geometric, gamma, and exponential distributions where appropriate. The expectations derived from the mathematical models yield numerical estimates of fertility components. The results suggest that unlike-sex twin-prone mothers have higher fecundity than controls when they conceive singletons. Further, fecundity appears high and unimpaired before the birth of twins. Mothers of like-sex twins experience somewhat shorter and but more variable birth intervals than corresponding controls before the birth of twins, suggesting within-group heterogeneity. Specifically, the birth of like-sex twins is preceded by low fecundity and a short period of postpartum amenorrhoea. Biologically, like-sex (presumably monozygotic) twin-prone mothers have a hormonal defect related eventually to menopausal status that interferes with ovulation and perhaps with lactation. As for unlike-sex twin-bearing mothers, they probably experience a displacement of their maximum fertility potential toward early reproductive life and an extension of their menstrual life. From a methodologic standpoint, the study of the fertility of twin-prone mothers cannot proceed without estimates of the fertility components of birth intervals, as these intervals do not lend themselves to straightforward analytical interpretations by statistical analyses.

Philipson K see **Svartengren M**

Picard R, Fraser D, Hagay ZJ, Leiberman JR: Twinning in southern Israel. Seasonal variation and effects of ethnicity, maternal age and parity.

J Reprod Med 1990 Feb;35(2):163-7
Seasonality of births in southern Israel was examined in two populations, Jews and Bedouins, with distinctly different life-styles. The study included 1,444 twin births that occurred between the years 1970 and 1986. The peak month for the birth of monozygotic twins was September in both populations, while the maximum number of deliveries occurred in January for the Bedouins and August for the Jews. Of Jewish dizygotic twin births, higher rates were found from July to December. In addition, the peak months of singleton births in women aged 35 years and older and in women of high parity did not coincide with the peak months of multiple births. Maternal age and parity have been shown to greatly influence twin birth rates. The autumnal peak we found, which was independent of ethnic origin and its associated cultural and sociologic differences, was also independent of maternal age and parity and was consistent with findings in other populations in the northern hemisphere. That finding suggests that a seasonal factor, as yet undefined, affects the rates of multiple births.

Picard R, Fraser D, Hagay ZJ, Leiberman JR: Twinning in southern Israel; secular trends, ethnic variation and effects of maternal age and parity. *Eur J Obstet Gynecol Reprod Biol* 1989 Nov; 33(2):131-9

Twin births in southern Israel between 1970 and 1986 were examined in the Jewish and Bedouin populations. An increase in dizygotic twinning in the whole population, largely due to an increase of rate in the Bedouin population was found. The dizygotic twinning rate in the Bedouin population rose until it reached the level found in the Jewish population. No change with time was found in the monozygotic twinning rates in either population.

This suggests that while dizygotic twinning rates are influenced by environmental factors, the monozygotic twinning rates are not. The effects of maternal age and parity on dizygotic and monozygotic twinning rates differed in the two ethnic groups examined. In the Jewish population the dizygotic twinning rate was related to maternal age and parity, while in the Bedouins only maternal age affects the rate. The monozygotic twinning rate has an inverted U shape with maternal age in the Jewish population and is linearly related to maternal age in Bedouin women. No effect of parity on the Jewish monozygotic twinning rate is found but this rate is directly affected by parity in Bedouin women. The effects of maternal age and parity together were examined in both populations. Both maternal age and parity affected the twinning rates; however, the effects are not additive and no interaction between maternal age and parity was found.

Pirskanen R see **Lefvert AK**

Plante E, Swisher L, Vance R: Anatomical correlates of normal and impaired language in a set of dizygotic twins. *Brain Lang* 1989 Nov;37(4):643-55

This report presents findings for a set of dizygotic twins at age 4 years 9 months. The male was diagnosed as specifically language impaired. For both children, the left-right perisylvian configuration was atypical. Only the male's configuration was symmetrical, a finding in line with autopsy data reported for subjects with "developmental dyslexia" who also may have had a form of language impairment. In addition, the male had an atypical (L greater than R) configuration of the cerebral hemispheres, a finding not seen in his twin, or in a series of volunteers without a history of developmental language impairment. The in utero effects of gonadal hormones that may account for these findings are discussed.

Plomin R, Pedersen NL, McClearn GE, Nesselroade JR, Bergeman CS: EAS temperaments during the last half of the life span: twins reared apart and twins reared together. *Psychol Aging* 1988 Mar;3(1):43-50

In this first behavioral genetic study of personality in the last half of the life span, results are reported using the powerful adoption/twin design that compares identical and fraternal twins reared apart and identical and fraternal twins reared together. Traits studied were the EAS temperaments (emotionality, activity level, and sociability), traits that show substantial genetic influence in childhood. It was hypothesized that the EAS traits would also show significant genetic influence later in life and that most of the environmental variation would be nonshared—that is, twins reared together would show no greater resemblance for the EAS traits than twins reared apart. Both hypotheses are supported.

Plomin R see **Bergeman CS**

Polinsky RJ see **St George-Hyslop PH**

Polman CH see **Uitdehaag BM**

Powell R see **Morley R**

Powell RW, Dyess DL, Luterman A, Simon NP, Ramenofsky ML: Necrotizing enterocolitis in multiple-birth infants. *J Pediatr Surg* 1990 Mar; 25(3):319-21

Over a 5-year period, 20 infants of multiple-gestation births (16 twin, 2 triplet) developed necrotizing enterocolitis (NEC) (15 infants) or suspected NEC (5 infants). During the same period, 532 infants of multiple gestations were admitted to our neonatal intensive care unit, yielding a NEC incidence in this population of 3.8%. In two twin sets, both infants developed NEC or suspected NEC, and in three sets only the affected twin was

AUTHOR SECTION

transferred to our nursery. Five infants required surgical intervention (25%) and three infants died (overall mortality, 15%). Fifteen siblings who did not develop NEC served as a control group. Analysis showed that the 1-minute Apgar score was the most significant factor in predicting NEC (P less than .028) and need for surgical intervention (P less than .020). In this series, 82% of the infants with 1-minute Apgar less than 6 developed NEC, whereas 31% with 1-minute Apgar greater than 6 developed NEC.

Prasad HS see **Sivasankaran P**

Price RA, Stunkard AJ: Commingling analysis of obesity in twins. *Hum Hered* 1989;39(3):121-35
Evidence is presented for multiple components in the distribution of human fatness across several large twin samples, after removing age effects and allowing for residual skewness in component distributions. The upper component distributions corresponded to overweight or obesity in samples of middle-aged or older individuals. A bivariate analysis demonstrated that, while monozygotic co-twins appeared to be drawn from the same component distributions (normal or overweight), the twin correlations varied across components, with the lowest correlation in the overweight group. While these analyses cannot provide a definitive test of competing genetic and environmental hypotheses, this approach is useful for generating hypotheses about the causes of obesity. When combined with other published literature, our results suggest that the genetic background largely determines the propensity to become obese. Whether a predisposed person becomes obese and the extent of obesity depend on environmental exposures that are largely independent of early family experience. Both genes and environment appear to be important in obesity, but it appears that some genotypes may be much more sensitive to the environment than are others.

Pullon HW see **Gounder DS**

Puri RK see **Bhat BV**

Purmann J, Bertrams J, Borchard F, Cleveland S, Berges W, Strohmeyer G: Crohn's disease in four members of a family, two of whom are dizygotic twins. *Hepato-gastroenterology* 1990 Feb;37(1):81-2
Familial occurrence of Crohn's disease (CD) is well known, but the disease is rarely reported to occur in dizygotic twins. We present an additional case of dizygotic twins, both of whom developed CD, from a family in which two other members are affected. The 16-year-old son contracted the disease 2 years before his 50-year-old father, and 13 years before his twin sister. Another sister was affected 6 years after the onset of the disease in the propositus. HLA haplotyping of the three children matched the Mendelian ratio. The multiple occurrence of CD in blood relatives, especially in siblings, emphasizes the importance of genetic factors in the development of this disease. This family history, however, could point to psychic influences promoting the occurrence of CD on the basis of a polygenic disease susceptibility.

Pyke DA see **Heaton DA**

Q

Quiroz VH, Sepúlveda WH, Mercado M, Bermúdez R, Fernández R, Varela J: Prenatal ultrasonographic diagnosis of thoracopagus conjoined twins.

J Perinat Med 1989;17(4):297-303

Conjoined twins are a rare obstetric event occurring 1/50,000 to 1/60,000 deliveries as a result of

incomplete fission of the embryonic disc before the third week of pregnancy. They belong to the monochorionic-monoamniotic type of monozygotic twins and are classified according to the area of union, the most common site being the chest and upper abdomen (thoracopagus). Reported are two cases of thoracopagus twins in which the diagnosis was made prenatally by ultrasound in the second trimester of pregnancy. The most significant ultrasound findings included the demonstration of a single cardiac activity, the inability to separate the fetal bodies at their ventral portion, and a face-to-face fetal position. The pregnancies were allowed to continue until term with no significant prenatal complications, and an elective cesarean section was performed to avoid a traumatic delivery. In both cases the infants died during the first week of life because of cardiorespiratory insufficiency. The ultrasound criteria for the antenatal diagnosis of conjoined twins are reviewed, concluding that the careful ultrasound examination of all identified sets of twins, specially in those cases in which no separating membrane is demonstrated, is the cornerstone in making the prenatal diagnosis. In addition, ultrasound plays a crucial role not only in the diagnosis, but also in establishing the degree of conjoining, which is essential for planning an appropriate obstetrical and perinatal management.

R

Rachmel A see **Waisman Y**

Ramenofsky ML see **Powell RW**

Rao DC see **Rice T**

Ratcliffe JM see **Blake KD**

Reece EA see **Winn HN**

Reed T see **Swan GE**

Reid JM, Houston AB, Lundmark E: Hypertrophic cardiomyopathy in identical twins. *Br Heart J* 1989 Nov;62(5):384-8

Hypertrophic cardiomyopathy was diagnosed in identical twin boys in early childhood. One underwent myomectomy at the age of 12 years because of progressive severe exertional dyspnoea accompanied by considerable obstruction of the left ventricular outflow tract shown on both echocardiography and cardiac catheterisation. Seven years later, at the age of 19, he remains incapacitated to a moderate degree. By contrast, the other twin has led a relatively normal life to date and no left ventricular outflow obstruction has been shown.

Reitz BA see **Cameron DE**

Rice T, Vogler GP, Perusse L, Bouchard C, Rao DC: Cardiovascular risk factors in a French Canadian population: resolution of genetic and familial environmental effects on blood pressure using twins, adoptees, and extensive information on environmental correlates. *Genet Epidemiol* 1989; 6(5):571-88

Genetic and environmental influences on systolic (SBP), diastolic (DBP), and mean arterial (MBP) blood pressure were examined using an expanded version of a path model in which parents and their singleton, twin, and adopted offspring were incorporated, and which also included an environmental index as an estimate of the underlying familial environmental component. Estimates of genetic heritability are lower in parents (10-15%) than in offspring (40-50%). Cultural heritability was significant for SBP (0.31) and MBP (0.40), and an intergenerational effect was found for DBP, with higher estimates in parents (0.42) than in offspring

AUTHOR SECTION

- (0.21). Marital resemblance was significant, and no support was found for differential maternal and paternal cultural transmission. Two novel results arising from this study are 1) gender-specific sibling effects, with greater female than male resemblance for SBP and MBP and the opposite pattern for DBP, and 2) the suggestion of extra twin resemblance arising on account of additional shared environments and resulting in greater like-sex than opposite-sex twin resemblance. The major conclusions drawn from this study are that 1) parameter estimates are stable with or without the use of extensive environmental indices, and 2) the addition of twins and adoptees did not significantly impact the results, with the exception of a possible influence of the adoptees in estimates of cultural heritability for DBP. Combining both these features (i.e., extended relatives and environmental indices) enables testing for additional sources of familial aggregation, which is not possible using the traditional nuclear family approach and results in a more accurate assessment of the relative roles of heredity and environment on blood pressure than has been previously possible.
- Richards CS, Watkins SC, Hoffman EP, Schneider NR, Milsark IW, Katz KS, Cook JD, Kunkel LM, Cortada JM:** Skewed X inactivation in a female MZ twin results in Duchenne muscular dystrophy. *Am J Hum Genet* 1990 Apr;46(4):672-81
- One of female MZ twins presented with muscular dystrophy. Physical examination, creatine phosphokinase levels, and muscle biopsy were consistent with Duchenne muscular dystrophy (DMD). However, because of her sex she was diagnosed as having limb-girdle muscular dystrophy. With cDNA probes to the DMD gene, a gene deletion was detected in the twins and their mother. The de novo mutation which arose in the mother was shown by novel junction fragments generated by HindIII, PstI, or TaqI when probed with cDNA8. Additional evidence of a large gene deletion was given by novel SfiI junction fragments detected by probes p20, J-Bir, and J-66 on pulsed-field gel electrophoresis (PFGE). Immunoblot analysis of muscle from the affected twin showed dystrophin of normal size but of reduced amount. Immunofluorescent visualization of dystrophin revealed foci of dystrophin-positive fibers adjacent to foci of dystrophin-negative fibers. These data indicate that the affected twin is a manifesting carrier of an abnormal DMD gene, her myopathy being a direct result of underexpression of dystrophin. Cytogenetic analysis revealed normal karyotypes, eliminating the possibility of a translocation affecting DMD gene function. Both linkage analysis and DNA fingerprint analysis revealed that each twin has two different X chromosomes, eliminating the possibility of uniparental disomy as a mechanism for DMD expression. On the basis of methylation differences of the paternal and maternal X chromosomes in these MZ twins, we propose uneven lyonization (X chromosome inactivation) as the underlying mechanism for disease expression in the affected female.
- Riese ML:** Maternal alcohol and pentazocine abuse: neonatal behavior and morphology in an opposite-sex twin pair. *Acta Genet Med Gemellol (Roma)* 1989; 38(1-2):49-56
- A pair of preterm, opposite-sex twins were examined during the lying-in period for behavioral and morphological effects of maternal alcohol and pentazocine abuse during pregnancy. A few morphological features typical of fetal alcohol syndrome were observed in each infant, and the male infant only was above the standardized mean in minor physical anomalies. The male's behavioral scores were more likely to be deviant from the standardized mean than the female's. Specifically, the male was more irritable, both spontaneously and in response to specific stimuli; highly active while awake and handled for the presentation of stimuli; more active than average during sleep; and low on ratings that reflect the attitude of the examiner toward the infant. These findings imply individual and gender differences in behavioral susceptibility to teratogens.
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- Pattern-reversal visual evoked potentials (PRVEPs) were tested in 11 sets of monozygotic (MZ) twins and 22 sets of dizygotic (DZ) twins matched on age, sex and educational level. They ranged in age from 7 to 15 years. The PRVEPs of MZ twins exhibited a significantly greater degree of similarity than those of DZ twins. The peak latencies and amplitudes of PRVEP components obtained from MZ twin pairs were significantly correlated. The correlation coefficients for the peak latencies of the P2 (or P100) component were the only ones to differ significantly between the DZ twins of the same sex and DZ twins of opposite sexes. These coefficients, obtained using PRVEPs, were much greater than those obtained with flash visual evoked potentials.
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- This is apparently the first triplet pregnancy after four freeze-thawed embryos that terminated in a birth of three healthy infants, with relatively good birth weights and uneventful follow-up.
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- Roussounis SH** see **Cundall DB**
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- Rusnak BW** see **Hancock BJ**

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- This paper reexamines recent epidemiologic and molecular genetic studies on the genetic basis of Alzheimer's Disease (AD). Careful analysis of the available epidemiologic data strongly suggests that at least a proportion of AD results from the inheritance of an autosomal dominant gene defect. However, studies of isolated families, of concordance rates in twins, and of risk for AD in relatives of AD probands yield conflicting data.

AUTHOR SECTION

- While it is likely that much of the conflict can be ascribed to methodologic differences, it remains premature to conclude that all AD is transmitted as an autosomal dominant trait. Molecular genetic techniques hold the promise of isolation and characterization of the genetic defect(s) in familial AD (FAD). Recently, chromosome 21 has been implicated as the potential site of an autosomal dominant defect in some but not necessarily all FAD pedigrees. However, the results of recent genetic epidemiologic studies suggest that progress in the molecular genetic approach to AD will be difficult.
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- Salisbury JR, Rose PE:** Primary central nervous malignant melanoma in the bathing trunk naevus syndrome. *Postgrad Med J* 1989 Jun;65(764):387-9
The gross and microscopic features of an unusual case of neurocutaneous melanosis are described. This is an example of the rare association between a primary central nervous system malignant melanoma and a giant congenital melanocytic naevus of 'bathing trunk' distribution.
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- Schieken RM, Eaves LJ, Hewitt JK, Mosteller M, Bodurtha JN, Moskowitz WB, Nance WE:** Univariate genetic analysis of blood pressure in children (the Medical College of Virginia Twin Study). *Am J Cardiol* 1989 Dec 1;64(19):1333-7
The relative contributions of genetic, individual environmental and shared environmental effects on resting blood pressure (BP) and heart rate (HR) were studied in prepubescent twins. The study population consisted of 251 caucasian 11-year-old twin pairs. Correlations were higher for all variables in monozygotic twins compared to dizygotic twins; this is consistent with a significant genetic effect. Path analysis revealed that the model of additive genetic and individual environmental effects fit systolic BP, diastolic BP and HR. In boys and girls, sex-specific genetic effects controlled systolic BP. The magnitudes of the sex-specific genetic effects on systolic BP were similar in both boys and girls and accounted for 66% of the variance. In boys, for diastolic BP, genetic effects accounted for 64% of the variance while in girls they accounted for 51%. These results provide no evidence for different genetic effects on HR in boys or girls. No shared environmental effects were detected. The large sample size and design, using different-sex dizygotic twins of the same age, establish that genes play an important role in the influence of resting BP and HR and that there are sex-specific genetic contributions in early pubertal children.
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- Schloesser PT** see **Brown JE**
- Schmidt W** see **Kanakas N**
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In this study the fetal weight was estimated by ultrasound measurements of the biparietal (BPD) and abdominal diameters (AD) in 154 consecutive twin pregnancies. In 80 twins an attempt to estimate fetal weight was made 0-4 days before delivery (26% of all twins examined). In 84% (67 infants) it was possible to estimate the fetal weight using the formula (0.0108 X AD^{1.72} X BPD^{0.99}). 60% of the birth weights deviated less than 10% from the estimated fetal weight and 83% deviated less than 15%. The prediction error was nearly constant, expressed as percent of actual weight in the different weight groups (8.5-9.8%). In 19 LGA infants, 69% of the birth weights deviated less than 10% from the estimated fetal weight and 70% deviated less than 15%.
- Segal NL, Dysken MW, Bouchard TJ Jr, Pedersen NL, Eckert ED, Heston LL:** Tourette's disorder in a set of reared-apart triplets: genetic and environmental influences. *Am J Psychiatry* 1990 Feb;147(2):196-9
Tourette's disorder was diagnosed in triplets reared apart from early infancy and reunited as adults. These data, combined with data on other family members, support the findings of research studies that have demonstrated genetic influences on Tourette's disorder.
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- Seo JW, Lee YS, Chi JG:** Cross-sectional illustration on major types of conjoined twins. *J Korean Med Sci* 1988 Mar;3(1):19-25
Conjoined twins show varying degree of conjoining in either facing or side-by-side fashion. Cephalothoracopagus janiceps is a prototype of facing anomaly in which the two bodies demonstrated a cross symmetry to the midline, that is axial symmetry. Interfacial and intersternal lines crossed at a right angle and no abnormality of situs was associated. Dicephalus dipus dibrachius is a case of side-by-side union, in which the bodies facing nearly the same direction were symmetrical to the middle sagittal plane. Abnormal situs of one was always associated. Other types of conjoined twins as thoracopagus lie between the two extremes of facing and side-by-side union. The three dimensional architectures of the organs in each type would be explained using cross sectional figures of skull, thorax and pelvis. Although the facing twins share the internal organs without fusion, the organs in the side-by-side component are fused with modification of the situs. We postulate sixteen pairs of situs and four manners of division for the explanation of the midline organs and the presence of a dominant co-twin. The splenic locations in a given cardiopulmonary situs are evaluated for the appraisal and applicability of these hypotheses.
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- Sidhu SS, Deshmukh RN:** Pierre Robin syndrome: autosomal dominant inheritance with pleiotropic effect. *Indian J Pediatr* 1989 May-Jun;56(3):413-7
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The morphogenesis of conjoined twins is incompletely understood. We therefore conducted a postmortem study of dicephalus dibrachius conjoined twins. The twins were born without pertinent history or prenatal diagnosis at 38 weeks and lived for several hours. External genitalia were female and partly duplicated; a caudal appendage was present in the thoracolumbar region. The heart and liver were shared and exhibited major abnormalities in configuration. Four lungs, three kidneys and adrenal glands, and two spleens were identified; biliary and upper gastrointestinal tracts appeared as mirror images. From these findings, we postulate three major sets of consequences arising

AUTHOR SECTION

- from the anatomical disposition of the twin notochords ("paleoaxes"). 1) The degree of convergence/divergence of craniocaudal paleoaxes is variable. Convergences are maximal in the upper thoracic and sacral regions, where duplication of organs is minimal because of interaction aplasia. 2) In the horizontal plane, paleoaxes are sufficiently divergent to produce a degree of twin expression posteriorly, whereas anteriorly they converge to form a single, anterior, midline "neoaxis." Interposed between these zones of paleoaxial and neoaxial expression are areas of variable interaction aplasia. 3) The left twin was in situs solitus; the right twin was in situs inversus in a manner resembling polysplenia.
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- Steen O, Vlietinck R:** Fertility in twins. *Acta Genet Med Gemellol (Roma)* 1989; 38(1-2):71-5
- From the 474 twins born in 1950 in 100 Flemish cities and towns in Belgium, 85% reached the age of 20 yr, against 37% in Austria a hundred years ago. More female than male twins are married ($P = 0.03$), in particular nonidentical female twins ($P = 0.02$). Fertility seems to be lower in male, especially male-male twins (P less than 0.03), and most strikingly so in identical male twins ($P = 0.05$). There seems to be no influence of premature birth or low birthweight.
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- We examined ischemic and hyperventilation tests in 14 pairs of healthy twins. In 3 of them we found different results of positivity or negativity of these tests. Women had signs of higher irritability of the wave M than men as concerned latency, amplitude, duration; the strength of stimulus was significantly lower in females than in males.
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- Suddath RL, Christison GW, Torrey EF, Casanova MF, Weinberger DR:** Anatomical abnormalities in the brains of monozygotic twins discordant for schizophrenia [see comments] *N Engl J Med* 1990 Mar 22;322(12):789-94
- Recent neuroradiologic and neuropathological studies indicate that at least some patients with schizophrenia have slightly enlarged cerebral ventricles and subtle anatomical abnormalities in the region of the anterior hippocampus. Using magnetic resonance imaging (MRI), we studied 15 sets of monozygotic twins who were discordant for schizophrenia (age range, 25 to 44 years; 8 male and 7 female pairs). For each pair of twins, T1-weighted contiguous coronal sections (5 mm thick) were compared blindly, and quantitative measurements of brain structures were made with a computerized image-analysis system. In 12 of the 15 discordant pairs, the twin with schizophrenia was identified by visual inspection of cerebrospinal fluid spaces. In two pairs no difference could be discerned visually, and in one the twin with schizophrenia was misidentified. Quantitative analysis of sections through the level of the pes hippocampi showed the hippocampus to be smaller on the left in 14 of the 15 affected twins, as compared with their normal twins, and smaller on the right in 13 affected twins (both P less than 0.001). In the twins with schizophrenia, as compared with their normal twins, the lateral ventricles were larger on the left in 14 (P less than 0.003) and on the right in 13 (P less than 0.001). The third ventricle also was larger in 13 of the twins with schizophrenia (P less than 0.001). None of these differences were found in seven sets of monozygotic twins without schizophrenia who were studied similarly as controls. We conclude that subtle abnormalities of cerebral anatomy (namely, small anterior hippocampi and enlarged lateral and third ventricles) are consistent neuropathologic features of schizophrenia and that their cause is at least in part not genetic. Further study is required to determine whether these changes are primary or secondary to the disease.
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- Tracheobronchial clearance and bronchial reactivity were studied in 6 asthma-discordant monozygotic twin pairs, and in 3 concordant pairs as controls. Clearance of 6-microns Teflon particles labeled with ^{99m}Tc was followed for 2 h. The results indicate that clearance in the larger airways is usually not severely impaired in mild to moderate asthma, and that it may be increased as well as decreased. Bronchial reactivity correlated with clearance in the nonasthmatics.
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- Bronchial reactivity was studied in six asthma-discordant monozygotic twin pairs. In four pairs, atopy was confirmed in the asthmatic twin. It was not confirmed in any of the nonasthmatics. In five pairs, the asthmatic twin was markedly more reactive than the nonasthmatic partner. Bronchial reactivity correlated significantly with total IgE. The results indicate that hyperreactivity and atopy were acquired.
- Swan GE, Carmelli D, Reed T, Harshfield GA, Fabsitz RR, Eslinger PJ:** Heritability of cognitive performance in aging twins. The National Heart, Lung, and Blood Institute Twin Study. *Arch Neurol* 1990 Mar;47(3):259-62
- The genetic contribution to performance on scales designed to measure mild to moderate decrements in cognitive functioning in a population at risk is unknown. In the present analysis, 134 monozygotic and 133 dizygotic male twin pairs (mean age, 63 years) were given three cognitive tests: the Mini-Mental State examination, the Iowa Screening Battery for Mental Decline, and, for comparison, the Digit Symbol Substitution Test from the Wechsler Adult Intelligence Scale. The primary objective of the analysis was to test for a significant heritable component to performance on these measures. A secondary objective was to determine the extent to which shared variance with significant

AUTHOR SECTION

confounders such as education, age, and depression affects the outcome of the heritability analysis. Results indicate that performance on tests intended to measure cognitive decline in the elderly does have a significant genetic component and that these estimates tend to increase after adjustment for covariates. Heritability estimates adjusted for covariates were 30% for the Iowa Screening score, 60% for the Mini-Mental State score, and 67% for the Digit Symbol Substitution score.

Swisher L see Plante E
Syner FN see Drugan A

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Takahashi H, Goto S, Kobayashi M, Takeuchi S: A method for differentiating between monozygotic and dizygotic twins.

Nippon Sanka Fujinka Gakkai Zasshi 1989 Dec; 41(12):2005-9

It has become possible to accurately differentiate monozygotic from dizygotic twins. In this study DNA fingerprinting was performed with new mini-satellite DNA as a probe. Identical DNA fingerprints from each twin indicate a monozygotic relationship and different fingerprints indicate a dizygotic relationship. In a case of dizygotic twins, the DNA fingerprints digested with *HinfI* indicated a monozygotic relationship, whereas the DNA fingerprints digested with *Mbol* showed a dizygotic relationship.

Takala AK, Rönnerberg PR, Kela E, Eskola J, Mäkelä M: Increased risk of primary invasive *Haemophilus influenzae* type B disease in twins.

Pediatr Infect Dis J 1989 Nov;8(11):799-800

Takeuchi S see **Takabashi H**

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Tandan R, Sharma KR, Bradley WG, Bevan H, Jacobsen P: Chronic segmental spinal muscular atrophy of upper extremities in identical twins.

Neurology 1990 Feb;40(2):236-9

We present the 1st report of chronic segmental spinal muscular atrophy confined to the upper extremities in identical male twins. This occurrence in identical twins, together with reports of siblings and parent-child pairs of a disorder phenotypically similar to the more common sporadic form in the literature, suggests a genetic etiology in some cases.

Tanzi RE see **St George-Hyslop PH**

Tarp U, Graudal HK: Seropositive rheumatoid arthritis in monozygotic twin sisters carrying HLA-DR4 or DR4 associated with B27. *J Rheumatol* 1989 Dec; 16(12):1530-2

We have followed 3 pairs of monozygotic twin sisters with seropositive rheumatoid arthritis (RA) since 1966, 1971 and 1975. RA developed in the probands at the age of 25, 39 and 21 years and in the cotwins 37, 8 and 19 years later, respectively. Two pairs, Nos 1 and 3, were discordant when first seen. Only Pair 1 had a family history of RA. Onset of RA was not related to marital status or pregnancy. It was improbable that contagious infections of childhood or seasonal infections could be important triggers of RA. Since the concordance rate for RA in monozygotic twins depends on the duration of the observation period, the previously stated concordance rate of 30% may be questioned.

Teikari JM, O'Donnell JJ: Astigmatism in 72 twin pairs. *Cornea* 1989 Dec;8(4):263-6

The Finnish Twin Cohort Study was used to compile twin pairs in whom one or both members had astigmatism. Seventy-two pairs of twins (42

monozygotic and 30 dizygotic) were found. Refractive error and astigmatism information was obtained by asking the twins to send their last prescription for glasses to the authors. The correlations between monozygotic twins for astigmatism were not higher than the correlations between dizygotic twins. The differences in the amounts of astigmatism in monozygotic twins was not statistically significantly different than that in dizygotic twins. This suggests that genetic factors do not contribute to astigmatism, leaving environmental causes as major contributors.

Tekin N see **Kural N**

Theewes BA see **Duvekot JJ**

Thomas CG Jr see **Hoyle RM**

Thompson GN, Chalmers RA, Halliday D: The contribution of protein catabolism to metabolic decompensation in 3-hydroxy-3-methylglutaric aciduria. *Eur J Pediatr* 1990 Feb;149(5):346-50

Leucine and protein metabolism were studied using stable isotope techniques in 6-year-old twins with 3-hydroxy-3-methylglutaric aciduria during acute metabolic decompensation. The decompensation was preceded by prolonged fasting in twin 1 and by an upper respiratory infection in twin 2. Twin 2 was also studied when well (control study). During infection, leucine oxidation (36 $\mu\text{mol/kg}$ per hour), protein catabolism (6.0 g/kg per day) and urinary excretion of major leucine metabolites (104 $\mu\text{mol/kg}$ per hour) were all increased compared with the control study (16 $\mu\text{mol/kg}$ per hour, 4.7 g/kg per day and 28 $\mu\text{mol/kg}$ per hour respectively). During fasting, leucine oxidation (18 $\mu\text{mol/kg}$ per hour) was unchanged and protein catabolism (4.1 g/kg per day) was decreased despite substantially increased urinary metabolite excretion (87 $\mu\text{mol/kg}$ per hour) compared with the control study. These results indicate that protein mobilisation and leucine oxidation played important roles in metabolic decompensation during infection but not during fasting. It is likely that the increased metabolite excretion during fasting arose primarily from fatty acid catabolism, indicating the importance of this substrate in metabolic decompensation in 3-hydroxy-3-methylglutaric aciduria.

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Thompson-Jacob D see **Jamison PL**

Thorpe J see **Neifert M**

Tilghman DM see **Cameron DE**

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Trudinger BJ, Cook CM, Giles WB, Connelly AJ, Thompson RS: Low-dose aspirin and twin pregnancy [letter] *Lancet* 1989 Nov 18;2(8673):1214

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Tutein Nolthenius-Puylaert MC see **Offringa PJ**

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Uitdehaag BM, Polman CH, Valk J, Koetsier JC, Lucas CJ: Magnetic resonance imaging studies in multiple sclerosis twins. *J Neurol Neurosurg Psychiatry* 1989 Dec;52(12):1417-9

Magnetic resonance (MR) imaging examinations were performed on a series of seven sets of twins (four monozygotic and three dizygotic) and one set of triplets who were clinically discordant for multiple sclerosis (MS). MR abnormalities were detected in some of the unaffected monozygotic

AUTHOR SECTION

pairs of twins.

Usha TS see Bhat BV

Utrilla J see Martínez-Urrutia MJ

V

Valauri FA, Buncke HJ, Alpert BS, Lineaweaver WC, Argenta LC: Microvascular transplantation of expanded free scalp flaps between identical twins. *Plast Reconstr Surg* 1990 Mar;85(3):432-6
Long-term follow-up of a previous free scalp transplant between identical twins is provided. A recent third transplant between these twins is presented in which donor flap expansion is used prior to transplantation, and the postoperative use of medicinal leeches is discussed.

Valk J see Uitdehaag BM

Vance R see Plante E

Van der Auwera JC see Eylenbosch WJ

Vander Kolk CA see Cameron DE

van Eyck J see Mulder AF

Varela J see Quiroz VH

Versaci C see Fishel S

Videman T see Heikkilä JK

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Vlietinck R see Steeno O

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Vohra K, Iqbal S, Dasilva M, Sahdev S, Shahar Y,

Jhaveri R: Visual diagnosis casebook. *Epignathus*.

J Perinatol 1989 Dec;9(4):448-50

Vuoristo M see Antero Kesäniemi Y

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Waisman Y, Rachmel A, Metzker A, Wielunsky E, Nitzan M, Rotem A, Steinherz R: Failure of etretinate therapy in twins with severe congenital lamellar ichthyosis. *Pediatr Dermatol* 1989 Sep; 6(3):226-8

We cared for twin females with severe lamellar exfoliation of the newborn (collodion babies) and a family history of death of two brothers at age 3 months. The twins were given a controlled trial of etretinate (Ro 10-9359, Tigason) after not responding to other therapeutic modalities. One of the infants received 1 mg/kg body weight of the drug for 24 hours, while her identical twin sister did not have the medication. Monthly skin biopsies taken from both patients during nine months of therapy did not demonstrate any histologic difference under light microscopy. The clinical course in both infants was basically the same. Etretinate plasma level measurements proved that the drug was absorbed from the gastrointestinal tract. We conclude that in the very severe forms of congenital lamellar ichthyosis, oral retinoids may fail to produce any beneficial effects.

Walker DJ see Deighton CM

Warenski JC, Kochenour NK: Intrapartum management of twin gestation. *Clin Perinatol* 1989 Dec;16(4):889-97 (32 ref.)

The intrapartum management of the patient with a multiple gestation should begin in the antenatal period. With the present widespread use of ultrasound, the number of multiple gestations diagnosed early in pregnancy has now increased, permitting determination of placentation and monitoring of fetal growth. When a patient with a twin gestation presents in labor, ultrasound should be used to establish fetal presentation and size. The fetal well-being should be evaluated with fetal heart monitoring, and assessment of potential maternal

complications, such as anemia, hypertension, and polyhydramnios, should be accomplished. With more than two fetuses, cesarean delivery is recommended. The principal controversy in intrapartum management of twin gestation relates to the planned route of delivery, particularly because this consideration is influenced by malpresentation and prematurity. There is general agreement favoring vaginal delivery for vertex-vertex twin pairs. With dual fetal heart rate monitoring and appropriate delivery room preparation for emergency cesarean section, recent evidence supports planned vaginal delivery of the mature nonvertex second twin. Elective cesarean section for the nonvertex second twin estimated as weighing less than 1800 gm is advised.

Watkins SC see Richards CS

Weber T see Secher NJ

Weinberger DR see Suddath RL

Weissman A see Blickstein I

Wesdorp JM see Duvekot JJ

Wetzel RC see Cameron DE

Whittle IR see Hardman PD

Whittle MJ see Hastie SJ

Wielunsky E see Waisman Y

Wildschut HI see Offringa YJ

Wilson N see Johnson VP

Winblad B see Pedersen NE

Winn HN, Gabrielli S, Reece EA, Roberts JA, Salafia C, Hobbins JC: Ultrasonographic criteria for the prenatal diagnosis of placental chorionicity in twin gestations. *Am J Obstet Gynecol* 1989 Dec;161(6 Pt 1):1540-2

Thirty-two patients with uncomplicated twin pregnancies had ultrasonographic examinations for genetic amniocentesis, confirmation of twinning, or assessment of fetal growth. The dividing membranes between the fetuses were visualized, and the thickness of the membranes was measured. With a thickness of 2 mm used as a cutoff point, the accuracy in predicting monochorionic or dichorionic twinning was 82% and 95%, respectively. Prenatal assessment of these dividing membranes may be helpful in the management of twin gestations.

Wiseman NE see Hancock BJ

Wittich AC: Conjoined twins: report of a case and review of the literature. *J Am Osteopath Assoc* 1989 Sep;89(9):1175-9 (14 ref.)

Conjoined twins, known to the layperson as Siamese twins, are a rare and catastrophic obstetric event. With the approximate incidence being 1 in 50,000 births, few physicians practicing obstetrics will have the unfortunate occasion to manage this biologic anomaly. Should this event occur, early diagnosis, close prenatal management, and the proper route of delivery will assure the best possible outcome for mother and both babies. The author describes the anatomic types of conjoined twins, the prenatal diagnosis and management, the route of delivery, and the overall statistical expectation. Under the best of circumstances, a good outcome is rarely achieved, but the obstetric goal should be a healthy mother and two salvageable babies.

Wittmann BK see Baldwin VJ

Wladimiroff JW see Mulder AF

Wyse RK see Blake KD

Y

Yousefzadeh D see Baron BW

AUTHOR SECTION**Z**

Zador IE see **Drugan A**
Zaltzman S see **Singer A**
Zamorano P see **Fernández H**
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Current Research on Multiple Births

ANNUAL BIBLIOGRAPHY — 1990

Produced by a MEDLARS search of the worldwide medical literature received by the National Library of Medicine, U.S. Public Health Service between June and November 1990. Sponsored by the Center for the Study of Multiple Birth, Chicago, Illinois.

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Authors, titles, journal source, and abstract (if available), alphabetized and cross-indexed by all authors.

* The first three subject sections include other topics related to these headings. Classification is performed automatically on the basis of keywords. Some articles may appear in two or three of the specific subject sections.

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- † Twins: a test of the equal environments assumption. Morris-Yates A, et al. *Acta Psychiatr Scand* 1990 Apr;81(4):322-6
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AUTHOR SECTION

A

Abdel-Rahim AR, Nagoshi CT, Vandenberg SG: Twin resemblances in cognitive abilities in an Egyptian sample. *Behav Genet* 1990 Jan;20(1):33-43

Thirty-six pairs of monozygotic (MZ) twins, 24 pairs of same-sexed dizygotic (DZ) twins, and 33 pairs of opposite-sexed DZ twins 12 to 19 years of age were tested in Minia, Egypt, on a battery of cognitive abilities tests. For most of the tests and composite scales, DZ resemblances were higher than typically found in Western samples and not significantly different from MZ resemblances. MZ resemblances were generally lower than typically found in Western samples. These results were discussed in terms of the influence of cross-cultural differences in degree of social stratification and assortative mating.

Ahlborn A see **Rodvall Y**

Allen R see **Andrews G**

Alongi A see **Iacono G**

Anah M see **Iroku RO**

Anderson M see **Campbell GD**

Anderson PG see **Campbell GD**

Anderson SJ see **Harshfield GA**

Ando Y see **Tanaka K**

Andrews G, Stewart G, Allen R, Henderson AS: The genetics of six neurotic disorders: a twin study.

J Affective Disord 1990 May;19(1):23-9

Persons who had met criteria for specific anxiety or depressive neuroses during their lifetime were identified from a sample of 446 pairs of adult twins. Although there was a genetic contribution to neuroticism and to symptoms, there was no inheritance of specific disorders. This concurs with previous work in a sample from the same Australian Twin Registry and with those from a Norwegian sample. It is concluded that while there is a genetic contribution to the predisposing trait, and therefore to the intermittent appearance of symptoms, this contribution is obscured by the grouping of symptoms into diagnoses and by the help seeking which is a prerequisite to clinical diagnosis.

Andrews G, Stewart G, Morris-Yates A, Holt P, Henderson S: Evidence for a general neurotic syndrome. *Br J Psychiatry* 1990 Jul;157:6-12

Neurotic syndromes are defined by characteristic patterns of symptoms, but the validity of the distinction between one syndrome and another depends on associations between the syndromes and clinical history, or treatment response factors that are independent of the defining phenomena. In both a group of twin volunteers and a group of patients with panic disorder/agoraphobia, the lifetime experience of more than one diagnosis of a neurotic syndrome was common but there was no evidence of patterns of co-occurrence of diagnoses being associated with particular syndromes. Receiving a diagnosis was associated with abnormal scores on measures of neuroticism and locus of control, the extent of the abnormality increasing with the number of different diagnoses satisfied. It is argued that the concept of a general neurotic syndrome depends in part on the presence of such predisposing personality factors, and that reduction in this predisposition to neurosis should be the focus of treatment.

Andrews G see **Morris-Yates A**

Angel JL see **Carlan SJ**

Arntzen A see **Magnus P**

Aronson MP see **Carr SR**

Aroora RC, Meltzer HY: 3H-imipramine binding in the blood platelets of normal twins. *Psychiatry Res* 1990

Jun;32(3):265-73

3H-Imipramine binding (IB) was studied in the blood platelets of 13 pairs of monozygotic (MZ) and dizygotic (DZ) twins, and 15 pairs of unrelated normal volunteers, to determine if IB is under genetic control. The intrapair variance of Bmax (the maximum number of 3H-IB sites) was significantly smaller in MZ twins and unrelated control pairs than in DZ twins. The intraclass correlations (ICC) of Bmax were significant for all the pairs with no difference between these correlations. The ICC of the Kd (inversely related to the affinity for 3H-imipramine) of IB was significant only for the normal control pairs and the DZ twins. These results suggest that the kinetic constants of IB in blood platelets are not under genetic control and that interassay variance significantly affects the absolute values for Kd and Bmax of 3H-IB. The environmental and assay factors that influence 3H-IB may account for the numerous discrepancies in platelet 3H-IB between various research reports.

Asaka A see **Ooki S**

B

Babu A see **Kanjilal D**

Bagshaw MA see **Spaas PG**

Bairagi R see **Chowdhury MK**

Bakketeig LS see **Magnus P**

Balsamo V see **Iacono G**

Barbour HM see **Cuckle H**

Barcella A see **Valsecchi R**

Barnes JE see **Henderson WG**

Barth RA, Filly RA, Goldberg JD, Moore P, Silverman NH: Conjoined twins: prenatal diagnosis and assessment of associated malformations. *Radiology* 1990 Oct;177(1):201-7

Prenatal diagnosis of conjoined twins is difficult and was rarely accomplished prior to the advent of sonography. Early prenatal diagnosis and assessment for shared vital organs are desirable for optimal obstetrical counseling and management. The authors retrospectively reviewed prenatal findings in 14 cases of conjoined twins. Thoracocephalic was the most common type of conjoining, occurring in five cases (36%). Prenatal sonography showed shared hearts in nine (64%) cases, indicating severe conjoining and negligible chance for postnatal correction. Two sets of omphalopagus conjoined twins had separate hearts; however, severe congenital heart disease was present. Early prenatal diagnosis and assessment of the degree of conjoining provided couples with the option for pregnancy termination via vaginal delivery. In this series, nine patients elected pregnancy termination prior to 24 weeks and delivered vaginally. Transvaginal ultrasound significantly improved the delineation of conjunction in two patients, and computed tomography permitted the diagnosis to be confirmed in two patients.

Bauer M, Lubs H, Lubs ML: Variable expressivity of neurofibromatosis-1 in identical twins.

Neurofibromatosis 1988;1(5-6):323-9 (19 ref.)

Monozygotic twins with Neurofibromatosis-1 (NF-1) who have both concordant and discrepant clinical manifestations are reported. At 7 years of age, both twins were found to have learning disabilities, poor fine and gross motor skills, but different distributions of café-au-lait spots, axillary freckling, and iris Lisch nodules; only twin A was found to have multiple neurofibromas involving the mesentery. Manifestations of mesenteric

AUTHOR SECTION

- neurofibromas have not been reported previously to occur this early in childhood; they are an unusual presenting feature of NF-1.
- Bell JA, Fielder AR, Viney S:** Congenital double elevator palsy in identical twins. *J Clin Neuro Ophthalmol* 1990 Mar;10(1):32-4
- A left-sided double elevator palsy in identical twins born prematurely is presented, the first such report in twins. The aetiology of this condition is considered, and given the preservation of Bell's phenomenon and the absence of hypotropia in the primary position, the possibility that this may represent a supranuclear defect is discussed.
- Benirschke K** see **Moore TR**
- Bennett FC** see **Hoffman EL**
- Berenbaum H, Oltmanns TF, Gottesman II:** Hedonic capacity in schizophrenics and their twins. *Psychol Med* 1990 May;20(2):367-74
- Audio-taped interviews recorded in the Gottesman-Shields schizophrenic twin series (17 pairs of identical twins, 14 pairs of fraternal same-sex twins, and 12 unpaired twins) were rated for level of hedonic capacity. Schizophrenics who were not hospitalized at the time of their interview were rated significantly lower (more impaired) on hedonic capacity than their normal co-twins. A significant negative correlation was also found between hedonic capacity and severity of illness. Hedonic capacity was found to be genetically influenced, although it appeared to be less heritable than the global diagnosis of schizophrenia. These results are consistent with Meehl's suggestion that reduced hedonic capacity is a heritable personality trait which potentiates the development of schizophrenia among those who are genetically predisposed to the disorder. The results suggest that anhedonia is not a phenotypic vulnerability marker for schizophrenia.
- Bergeman CS, Plomin R, Pedersen NL, McClearn GE, Nesselroade JR:** Genetic and environmental influences on social support: the Swedish Adoption/Twin Study of Aging. *J Gerontol* 1990 May;45(3):P101-6
- A new direction in behavioral genetic research is the exploration of genetic influences on ostensibly environmental measures. The goal of the present study was to identify genetic as well as environmental influences that contribute to an individual's motivation and ability to create and maintain social support systems during the second half of the life course. One of the most powerful behavioral genetic designs is the combined twin/adoption design which is used in the Swedish Adoption/Twin Study of Aging (SATSA). A subsample of 424 pairs of twins age 50 and above was used: 64 pairs of identical twins reared apart, 95 pairs of identical twins reared together, 132 pairs of fraternal twins reared apart, and 133 pairs of fraternal twins reared together. The measure of social support assessed both the quantity of relationships as well as the perceived adequacy of the social support network. Model-fitting analyses verified the importance of genetic factors for perceived adequacy of the social support network, whereas little genetic influence was found for the quantity of social relationships.
- Berger MJ** see **Claman P**
- Bernieri F** see **McCartney K**
- Bigelow LB** see **Casanova MF**
- Blake KD, Jellinek DC:** Visiting and immunisation policies on a regional neonatal unit [letter] *Lancet* 1990 Aug 4;336(8710):308-9
- Blickstein I, Borenstein R:** Recurrent spontaneous twinning. *Acta Genet Med Gemellol (Roma)* 1989; 38(3-4):279-83
- The perinatal outcome of seven recurrent twin deliveries after 28 weeks gestation, was compared to the first twin delivery and to randomly selected controls matched for parity, maternal age and gestational age. The outcome of the recurrent twin gestation was associated with significantly increased gestational age (P less than 0.04) and mean twin birth weight (P less than 0.05) compared to the first twin pregnancy. When compared to controls matched for maternal age and gestational age they were of significantly higher parity (P less than 0.005) but had otherwise similar obstetric characteristics as when compared to controls matched for parity. These data suggest a better outcome for the recurrent compared to the first twin gestation. The frequencies of repeat twinning (0.0165% of all deliveries) and the calculated probability of having by chance a recurrent twin delivery were significantly different (P less than 10(-6)) suggesting that both deliveries may be stochastically dependent events.
- Bloom BT** see **Park YI**
- Bodurtha JN, Mosteller M, Hewitt JK, Nance WE, Eaves LJ, Moskowitz WB, Katz S, Schieken RM:** Genetic analysis of anthropometric measures in 11-year-old twins: the Medical College of Virginia Twin Study. *Pediatr Res* 1990 Jul;28(1):1-4
- We have conducted a cross-sectional analysis of the genetic and environmental contributions to the variance of anthropometric measurements in children during early adolescence. Univariate path analysis was used to estimate the relative contributions of genes, individual environment, and family environment to measures of childhood obesity in 259 11-year-old Caucasian twin pairs. Triceps, subcapular, and suprailiac skinfold thicknesses, as well as waist circumferences, ht, and wt were measured in a standardized protocol. In this sample, a parsimonious model that included only additive genetic effects and environmental factors unique to the individual provided an adequate explanation for the variation in ht, wt, quetelet index, and subcapular and triceps skinfolds. In this largely preadolescent population, different magnitudes of genetic effects were seen in males and females for waist circumference, iliac diameter, and suprailiac skinfold.
- Boice JD** see **Rodvall Y**
- Bonilla E, Younger DS, Chang HW, Tantravahi U, Miranda AF, Medori R, DiMauro S, Warburton D, Rowland LP:** Partial dystrophin deficiency in monozygous twin carriers of the Duchenne gene discordant for clinical myopathy. *Neurology* 1990 Aug;40(8):1267-70
- We studied monozygous twin women, age 63. One, asymptomatic, had a serum creatine kinase (CK) level of 191 units (normal, 1 to 50); her son died of typical Duchenne muscular dystrophy (DMD) at age 18. Her twin sister had symptomatic limb weakness from about age 40. Her serum CK was 495 units. EMG and muscle biopsy were compatible with myopathy. In the asymptomatic twin, the peripheral blood lymphocyte karyotype was 46,XX. In the affected twin, 18% of cells were 45,X, and the others 46,XX, without X/autosome translocation. DNA analysis did not reveal a deletion at the DMD locus. Immunologic studies of dystrophin showed a partial deficiency of the protein that was more severe in the symptomatic twin. The clinical discordance and the different severity of dystrophin deficiency may have resulted from the effects of lyonization.
- Bønnelykke B:** Social class and human twinning.

AUTHOR SECTION

J Biosoc Sci 1990 Jul;22(3):381-6

In a comparative study to examine the effect of social factors on human twinning, data on sociodemographic and other factors were collected from parents of all twins born alive in Denmark in 1984 or 1985 and from a random sample of parents of singleton infants born in the same years. A postal questionnaire was used. The twins were classified as monozygotic (MZ) or dizygotic (DZ) twins by the similarity method. A trend was found in DZ-twinning, with significantly fewer DZ-twins born in the lower social classes, but not in MZ-twinning. All results were controlled for maternal age and parity.

Bønnelykke B, Hauge M, Holm N, Kristoffersen K, Gurtler H: Evaluation of zygosity diagnosis in twin pairs below age seven by means of a mailed questionnaire. *Acta Genet Med Gemellol (Roma)* 1989;38(3-4):305-13

The mothers of a consecutive series of 125 same sexed pairs of twins aged 6 months to 6 1/2 years completed a mailed questionnaire concerning the physical similarity of the twin partners. Zygosity diagnoses were first determined blindly on the basis of the answers given by the mothers, who did not know the result of the blood group test when fulfilling the questionnaire. Next, the results were compared with the zygosity determination based on examination of erythrocyte-, serum- and enzyme-groups. It turned out that a few simple questions distinguished well enough between MZ and DZ pairs, with a frequency of misclassification of 4%, leaving 5% as unclassifiable. It is concluded that twin zygosity can be estimated by a simple questionnaire with sufficient accuracy even in very young twin pairs. This has relevant implications for more extensive twin studies where the use of a wide spectrum of serological characters would imply too high expenses.

Bønnelykke B, Olsen J, Nielsen J: Coital frequency and twinning. *J Biosoc Sci* 1990 Apr;22(2):191-6

In a comparative study to enquire whether parents of twins, especially of dizygotic twins, have a higher frequency of sexual intercourse than parents of singleton infants, data on sociodemographic status, coital frequency and other variables were collected using a postal questionnaire. Parents of all twins born alive in Denmark in 1984 or 1985 were included as cases and a random sample of parents of singleton infants born in the same period were controls. No evidence of any difference in coital frequency was found between parents of twins (neither dizygotic twins nor monozygotic) and parents of singleton infants.

Bontempelli M see **Valsecchi R**

Borenstein R see **Blickstein I**

Borhani NO see **Havlik RJ**

Bouchard C, Pérusse L, Leblanc C: Using MZ twins in experimental research to test for the presence of a genotype-environment interaction effect. *Acta Genet Med Gemellol (Roma)* 1990;39(1):85-9

Despite some evidence that genotype-environment interaction (G x E) effects may be involved in the variation observed in behavioral and biological traits, few attempts have been made to detect and quantify this component of genetic variation in humans. We propose that one way to achieve this goal is to challenge several genotypes in a similar manner, submitting both members of several MZ twin pairs to an ethically acceptable experimental treatment capable of inducing an adaptive response. In this situation, the G x E effect can be assessed with a two-way analysis of variance for repeated measures

on one factor, the treatment effect. In this design, twins are considered nested within the pair, whereas the treatment effect is considered a fixed variable. The intrapair resemblance in the response to the treatment is quantified with an intraclass correlation coefficient computed with between-sibships and within-sibships means of squares. To illustrate this approach, changes induced by long-term endurance training were studied in 10 MZ twin pairs.

Significant intrapair resemblance in the response of maximal oxygen uptake was observed, with about 7 to 8 times more variance between pairs than within pairs. This design with MZ twins may be helpful in the study of human variation for multifactorial phenotypes.

Bouchard C, Tremblay A, Després JP, Nadeau A, Lupien PJ, Thériault G, Dussault J, Moorjani S, Pinault S, Fournier G: The response to long-term overfeeding in identical twins [see comments] *N Engl J Med* 1990 May 24;322(21):1477-82

We undertook this study to determine whether there are differences in the responses of different persons to long-term overfeeding and to assess the possibility that genotypes are involved in such differences. After a two-week base-line period, 12 pairs of young adult male monozygotic twins were overfed by 4.2 MJ (1000 kcal) per day, 6 days a week, for a total of 84 days during a 100-day period. The total excess amount each man consumed was 353 MJ (84,000 kcal). During overfeeding, individual changes in body composition and topography of fat deposition varied considerably. The mean weight gain was 8.1 kg, but the range was 4.3 to 13.3 kg. The similarity within each pair in the response to overfeeding was significant (P less than 0.05) with respect to body weight, percentage of fat, fat mass, and estimated subcutaneous fat, with about three times more variance among pairs than within pairs (r approximately 0.5). After adjustment for the gains in fat mass, the within-pair similarity was particularly evident with respect to the changes in regional fat distribution and amount of abdominal visceral fat (P less than 0.01), with about six times as much variance among pairs as within pairs (r approximately 0.7). We conclude that the most likely explanation for the intrapair similarity in the adaptation to long-term overfeeding and for the variations in weight gain and fat distribution among the pairs of twins is that genetic factors are involved. These may govern the tendency to store energy as either fat or lean tissue and the various determinants of the resting expenditure of energy.

Bouchard TJ Jr see **Grove WM**

Bouchard TJ Jr see **Lykken DT**

Broadbent BA: The incidence of twins in care. *Child Care Health Dev* 1990 Mar-Apr;16(2):139-43

The birth of twins, triplets or more is usually a reason for great celebration. Evidence suggests, however, that in some circumstances a multiple birth creates serious difficulties for parents and may cause enormous stress within a family. One crude indicator of family breakdown is the reception of children into Local Authority care: during 1988, the author attempted to establish the incidence of twins in care (or on social workers' caseloads where preventive work was being done) by gathering figures from Directors of Social Services in Local Authorities in England, Wales and Northern Ireland. Whilst analysis of the figures at first suggests that there is no over-representation of 'multiples' in Local Authority care, it is suggested that the results of the first survey should be treated with caution. The majority of Local Authorities have not so far

AUTHOR SECTION

identified twins, etc., on their records (nor, indeed, has the Department of Social Services) and so identification had to be done on a 'common surname and date of birth' basis, where that was possible. Many single twins would thus be missed. Only 36% of Local Authorities were able to provide complete figures for sets of twins in care. Reliable data for the incidence of twins on social workers' caseloads (children not in care) proved impossible to collect. Information about multiples should be much easier to obtain in the future. Many Local Authorities are now installing or operating computer systems. Over half of those Directors who could not provide figures at the moment indicated that they would be able to do so on a future occasion.

Brown DW: A possible model for the genetics of certain diseases. *Acta Biotheor* (Leiden) 1990 Mar; 38(1):73

Brown HL, Miller JM Jr, Neumann DE, Sarpong DF, Gabert HA: Umbilical cord blood gas assessment of twins. *Obstet Gynecol* 1990 May;75(5):826-9

Umbilical cord arterial and venous blood gas values were compared in 63 twin pairs, of which 57 pairs had birth weights of 1500 g or more each. Small differences between the first and second twins existed for PO₂, PCO₂, and pH. However, bicarbonate values did not differ significantly. These cord gas differences represent minor respiratory aberrations, as reflected by a tendency toward carbon dioxide retention by the second twin. Route of delivery, time interval between deliveries, and nonvertex presentations were not associated with significant deviations from these observed acid-base patterns.

Brown SW see **Campbell GD**

Brown I see **Corruccini RS**

Bunker CB, Erskine K, Rustin MH, Gilkes JJ: Severe polymorphic eruption of pregnancy occurring in twin pregnancies. *Clin Exp Dermatol* 1990 May; 15(3):228-31

We describe three women pregnant with twins who developed severely symptomatic polymorphic eruption of pregnancy. In all of these women oral prednisolone treatment was indicated and administered to two of them with resulting remission. Both these women breast fed their twins and relapsed in the puerperium requiring further systemic steroid therapy. The third woman was cured by early elective delivery. It has not been previously suggested that the severity of polymorphic eruption is related to multiple pregnancy and this possibility is discussed. The safety of oral prednisolone in pregnancy and during lactation is also reviewed.

C

Campbell GD, Brown SW, Anderson M, Anderson PG: Separation of conjoined twins. *Aust N Z J Surg* 1990 Jan;60(1):59-61

The incidence of conjoined twins is rare, occurring in one in 50-80,000 live births. The rarity of the occurrence presents quite a management challenge. The first case in New Zealand of successfully separated thoraco-omphalagus twins, presenting top-to-tail, is described.

Campbell WA see **Rodis JF**

Carlan SJ, Angel JL, Sawai SK, Vaughn V: Late diagnosis of nonconjoined monoamniotic twins using computed tomographic imaging: a case report. *Obstet Gynecol* 1990 Sep;76(3 Pt 2):504-6

Monoamniotic twin gestations, although rare, are

associated with a high perinatal mortality rate. Early antenatal diagnosis is important to ensure optimal perinatal care. However, the diagnosis can be difficult to confirm, especially in late gestation when a dividing membrane may be difficult to visualize. Intra-amniotic injection of Renografin followed by a single-slice computed tomographic scan at the level of the umbilicus is described. This imaging method assisted in the confirmation of monoamniotic twinning.

Carmelli D, Swan GE, Robinette D, Fabsitz RR: Heritability of substance use in the NAS-NRC Twin Registry. *Acta Genet Med Gemellol* (Roma) 1990; 39(1):91-8

This study examines the heritability of cigarette smoking, alcohol, and coffee consumption in 4,960 adult, male twin pairs (2,390 MZ and 2,570 DZ pairs) participants in an epidemiologic survey of the NAS-NRC Twin Registry conducted in the USA during 1972-73. Heritability estimates for smoking, alcohol and coffee use were calculated both before and after adjustment for shared variance between these behaviors and other demographic characteristics including socioeconomic status and an occupational adjustment score. The objective of the analysis was to determine the impact of adjustment for covariates on heritability estimates of smoking, alcohol and coffee use. Before adjustment, genetic effects in smoking, alcohol and coffee use accounted for 53%, 36%, and 45% of the variance, respectively. After adjustment, the corresponding estimates were 35%, 29%, and 36%. The fact that these estimates remained significant after adjustment for covariates leads to increased confidence about the role of genetic factors in substance use behaviors.

Carr SR, Aronson MP, Coustan DR: Survival rates of monoamniotic twins do not decrease after 30 weeks' gestation. *Am J Obstet Gynecol* 1990 Sep; 163(3):719-22

A search of pathology records from the years 1967 to 1988 at Women and Infants' Hospital of Rhode Island (138,232 live births) revealed 24 sets of histologically confirmed monoamniotic twins. All records were available for review. Among the 17 sets of monoamniotic twins that reached 30 weeks' gestation with at least one twin still alive, there were no further fetal deaths. The risks of early delivery in these pregnancies appear to outweigh the risk of fetal death as a result of monoamniotic status alone. These data do not show an advantage to early delivery.

Carroccio A see **Iacono G**

Casanova MF, Zito M, Goldberg TE, Suddath RL, Torrey EF, Bigelow LB, Sanders RD, Weinberger DR: Corpus callosum curvature in schizophrenic twins [letter] *Biol Psychiatry* 1990 Jul 1;28(1):83-4

Casanova MF, Sanders RD, Goldberg TE, Bigelow LB, Christison G, Torrey EF, Weinberger DR: Morphometry of the corpus callosum in monozygotic twins discordant for schizophrenia: a magnetic resonance imaging study. *J Neurol Neurosurg Psychiatry* 1990 May; 53(5):416-21

The corpus callosum (CC) has been the focus of several morphometric studies of patients with schizophrenia, but the results of these studies have been contradictory. In an attempt to improve the reliability of morphometric measurements of the corpus callosum, a computerised image analysis system was used to measure the shape, area, thickness and length of the CC on magnetic resonance imaging (MRI) in 12 pairs of monozygotic

AUTHOR SECTION

- twins discordant for schizophrenia (SC). No differences in CC area (anterior, middle, posterior thirds and total), length or vertical thickness of the CC body (at three levels) were demonstrated by t test comparisons of the affected SC and unaffected twins. Statistical analysis of a Fourier expansion series suggested differences in shape between normal and SC cotwins in the second harmonic of the anterior and middle segments and effects of gender on posterior CC shape. These results fail to replicate previous findings of altered length, thickness and area in the schizophrenic CC, but implicate disease-related shape differences in the anterior and middle segment of the corpus callosum and gender-related differences in splenium shape. The disease-related shape distortion suggest ventriculomegaly rather than an intrinsic abnormality of the corpus callosum.
- Casanova R** see **Haddad J**
- Casson IF** see **Hipkin LJ**
- Cattanach SA, Wedel M, White S, Young M:** Single intrauterine fetal death in a suspected monozygotic twin pregnancy. *Aust N Z J Obstet Gynaecol* 1990 May;30(2):137-40 (12 ref.)
- The antepartum death of a fetus in a twin pregnancy is associated with significant risk of mortality and morbidity in the surviving infant. A recent case of single intrauterine death in a suspected monozygotic twin pregnancy at a regional hospital prompted a study of similar cases in the hospital's recent experience and a review of the current literature. We report the successful conservative management of fetal death in a monozygotic twin pregnancy.
- Cavataio F** see **Iacono G**
- Chang HW** see **Bonilla E**
- Chen CJ, Yu MW, Wang CJ, Tong SL, Tien M, Lee TY, Lue HC, Huang FY, Lan CC, Yang KH, et al:** Genetic variance and heritability of serum cholesterol and triglycerides among Chinese twin neonates. *Acta Genet Med Gemellol (Roma)* 1990; 39(1):123-31
- In order to examine the genetic variance and heritability of serum total cholesterol, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C) and triglycerides, a total of 349 pairs of same-sexed twin neonates born in four major general teaching hospitals in Taipei City were studied. Based on the placental pattern and 12 red blood cell antigens, 271 monozygotic (MZ) and 78 dizygotic (DZ) twin pairs were identified. There was a significant genetic variance for total cholesterol, HDL-C, LDL-C, and triglycerides both unadjusted and adjusted for sex, gestational age and placentation. The unadjusted heritability of total cholesterol, HDL-C, LDL-C, and triglycerides was 0.59, 0.30, 0.25 and 0.75, respectively; while the corresponding adjusted heritability was 0.74, 0.38, 0.31, and 0.49, respectively. Intrapair variance of serum lipids was not significantly different between monozygotic and dichorionic MZ twins.
- Chen CJ** see **Yu MW**
- Chescheir NC** see **Thorp JM Jr**
- Cheung A, Wan M, Collins RJ:** Differentiation of monozygotic and dichorionic twin placentas by antenatal ultrasonic evaluation. *Aust N Z J Obstet Gynaecol* 1990 May;30(2):134-6
- The prenatal identification of various types of placentation is important for the antenatal management of twin pregnancies. Such classification can be achieved with the use of ultrasound examination. In 32 cases of twin pregnancy the intervening septum was classified as either a thick (dichorionic) or thin (monozygotic) type. Macroscopic and microscopic examination of the placenta after delivery confirmed the ultrasound diagnosis in 24 of the 30 cases, an accuracy of 80%.
- Chi JG:** Acardiac twins--an analysis of 10 cases. *J Korean Med Sci* 1989 Dec;4(4):203-16
- The pathological characteristics of the acardiac fetus were studied based on 10 autopsy cases. These cases were collected during a 13-year period at Seoul National University Hospital. All 10 fetuses were monozygotic twins, and six of them were male. Externally normal co-twins survived in five cases and died perinatally in three cases. The gestational period of these acardiacs ranged from 20 to 33 weeks. All of them showed a growth arrest of a fairly wide spectrum. Four cases belonged to acardius anceps, five were acardius acephalus, and one was acardius amorphus. Nine out of 10 cases were holoacardius, whereas one was hemicardius with a vestigial heart tube present. Characteristic artery-to-artery anastomoses were demonstrated in all cases where examination was possible. The umbilical cords of the acardiacs often consisted of only two vessels, i.e., one umbilical artery and one umbilical vein, and these vessels were directly attached to the arteries and veins of the normal co-twins on the placental surface. The vascular system of the acardiac fetuses was simplified, providing only inflow and outflow pathways through common iliac vessels and vitelline vessels. When the head part was preserved (acardius anceps), the facial features were indistinguishable, particularly in the midfacial region, which resulted in a characteristic holoprosencephalic malformation of the brain in two out of four cases. Normal eyeball structure was not noted in any of these cases. The oral cavity and tongue were rarely recognized. Once the head part was absent (acardius acephalus) there was a wide variation of thoracic organ development. Hypoplastic lungs were seen in three cases, and they were connected to the trachea. A tracheoesophageal fistula was seen twice. The gastrointestinal tract was the most common feature of these acardiac monsters. However, it often lacked some portions, such as a stomach, midgut or part of a large intestine. The kidneys, testes and other parts of the urinary system were other common constituents of the acardiacs.
- Chien CH, Lee JS, Tsai WY, Wang TR:** Wiedemann-Beckwith syndrome with congenital central hypothyroidism in one of monozygotic twins. *Taiwan I Hsueh Hui Tsa Chih* 1990 Feb;89(2):132-6
- A pair of monozygotic twins discordant for the Wiedemann-Beckwith syndrome (WBS) associated with congenital central hypothyroidism is described. During pregnancy, the mother was noted to have marked polyhydramnios and severe abdominal distension. At birth, a large diamniotic, monozygotic placenta was noted. According to a study of the minor blood groups and HLA typing, the possibility of monozygosity is 0.985. The mode of inheritance of the syndrome is debatable, and according to observations of discordance in monozygotic twins, single gene control seems unlikely. The thyroid function was noted to be subnormal when the proband was 3 days old. Oral thyroxine has been supplied since infancy. Repair of the umbilical hernia, the bilateral inguinal hernia, and a bilateral orchidopexy were done. A partial glossectomy was later performed to prevent progressive orofacial maldevelopment. The postnatal gigantism persisted as he grew.
- Chinnappa J** see **Raghuveer G**
- Chowdhury MK, Khan NU, Wai L, Bairagi R:** Sex

AUTHOR SECTION

differences and sustained excess in mortality among discordant twins in Matlab, Bangladesh: 1977-1985. *Int J Epidemiol* 1990 Jun;19(2):387-90

This paper reports findings from a study that compared survival of 204 pairs of liveborn twins discordant for sex and a random sample of 2371 singleton live births from the same population in Matlab, Bangladesh during the period 1977-1985. The discordant twins showed no evidence of sex differential in neonatal survival. They had neonatal mortality of 287 and infant mortality of 468, both per 1000 live births. These rates were respectively five and four times the rate for singletons in the study. Survival from 12 months through age nine years was similar overall for both discordant twins and singletons for each sex. However, higher female than male mortality was present among discordant twins after the first few months of life. This differential was most prominent during the second year of life and appeared wider than that observed for the singletons.

Christian JC see **Havlik RJ**

Christison G see **Casanova FM**

Claman P, Berger MJ: Phenotypic differences in upper genital tract abnormalities and reproductive history in dizygotic twins exposed to diethylstilbestrol in utero. A case report. *J Reprod Med* 1990 Apr; 35(4):431-3

Major phenotypic variations in reproductive function and upper genital tract abnormalities were found between 30-year-old dizygotic twins exposed in utero to diethylstilbestrol (DES). The women were exposed to maternal DES doses of 12.5-50.0 mg daily starting from the 12th gestational week as documented in the original antepartum obstetric office records. Twin A had primary involuntary infertility of over four years' duration associated with a severe DES uterine deformity on hysterosalpingography (HSG). A complete evaluation demonstrated all other infertility investigations to be normal. Twin B had two term pregnancies but a significant history of reproductive loss, including three miscarriages and one ectopic pregnancy. HSG demonstrated mild DES-induced changes. Cervical adenosis was observed only in the more severely affected twin.

Clifford C see **Hay DA**

Collins RJ see **Cheung A**

Corruccini RS, Townsend GC, Richards LC, Brown T: Genetic and environmental determinants of dental occlusal variation in twins of different nationalities. *Hum Biol* 1990 Jun;62(3):353-67

We have compared 10 occlusal traits in 358 monozygous and dizygous twin pairs in 4 different samples and estimated genetic variances for these features. Variable and frequently nonsignificant genetic variance was noted across samples for incisal overbite and overjet, sagittal molar relationship, posterior crossbite, and rotations and displacements of anterior teeth. Heritability estimates (when appropriately calculated) were low in magnitude (0-40%) and erratic, emphasizing the importance of environmental influences on occlusal variation and the variability of apparent genetic determinants with respect to the environment or population in which they are measured.

Corter C see **Minde K**

Coustan DR see **Carr SR**

Crowther CA, Hamilton RA: Triplet pregnancy: a 10-year review of 105 cases at Harare Maternity Hospital, Zimbabwe. *Acta Genet Med Gemellol (Roma)* 1989; 38(3-4):271-8

During the 10-year period, 1975-1984, 105 triplet pregnancies were delivered at Harare Maternity Hospital, Zimbabwe, among 286,338 pregnancies in the Greater Harare Unit, giving an incidence of triplets of 1:2,727. The mean gestational age at delivery was 32.5 wk with 81 women (77.1%) delivering before 37 wk. Primigravidae delivered at a significantly earlier mean gestational age (P less than 0.05) and had a higher perinatal mortality (P less than 0.001) compared with grand multigravidae. Of the 315 babies, 277 (87.9%) weighed less than 2500 g. The overall perinatal mortality rate was 327%, with a perinatal mortality rate of 146% for infants weighing greater than or equal to 1000 g. Women hospitalised for bed rest during the antenatal period had fewer perinatal deaths compared with those diagnosed during the antenatal period, but not hospitalised for bed rest (P less than 0.02). No difference was found in the mean gestational age at delivery or the mean birth weights between these two groups. Among infants greater than or equal to 28 wk gestation there were fewer perinatal deaths in triplets delivered by cesarean section compared with triplets delivered vaginally (P less than 0.0004). This suggests that cesarean section may offer the optimal mode of delivery in triplet pregnancy.

Cuckle H, Wald N, Stevenson JD, May HM, Ferguson-Smith MA, Ward AM, Barbour HM, Laurence KM, Norgaard-Pedersen B: Maternal serum alpha-fetoprotein screening for open neural tube defects in twin pregnancies. *Prenat Diagn* 1990 Feb;10(2):71-7

Data on maternal serum alpha-fetoprotein (AFP) levels at 13-24 weeks' gestation in 46 twin pregnancies with open neural tube defects (22 with anencephaly, 24 with open spina bifida) and 169 unaffected twins were used to estimate the detection and false-positive rates associated with different cut-off levels. Using the conventional cut-off level of 2.5 multiples of the median (MoM) for unaffected singleton pregnancies of the same gestation and laboratory, the detection rate in twins was 99 per cent for anencephaly and 89 per cent for open spina bifida, with a false-positive rate of 30 per cent. Using a 5.0 MoM cut-off level to maintain a similar false-positive rate to that found among singleton pregnancies at 16-18 weeks' gestation (about 3 per cent), the detection rate was 83 per cent for anencephaly and 39 per cent for open spina bifida. Estimates are provided of the odds of having an affected twin pregnancy given a positive AFP result as well as the odds for individual women with a raised AFP level.

Cyphers LH, Phillips K, Fulker DW, Mrazek DA: Twin temperament during the transition from infancy to early childhood.

J Am Acad Child Adolesc Psychiatry 1990 May; 29(3):392-7

A multiple-regression model for the analysis of twin data in which one twin's score is predicted from that of its co-twin, the coefficient of relationship, and the interaction term provides direct estimates of heritability (h^2) and the proportion of variance due to shared environmental influences (c^2). Several multiple-regression models were fitted to parental ratings of infant and toddler temperament for 306 pairs of twins. High estimates of h^2 were found for eight of the nine temperament scales, and three scales showed significant effects of c^2 . No differential heritability was found between males and females across the infant and toddler years.

Czeizel A see **Métneki J**

AUTHOR SECTION

D

- D'Armiento MR** see **Martinelli P**
- Davis JC** see **Hipkin LJ**
- Dawod S** see **Ghanem Q**
- Degani S:** Fetal Doppler velocimetry in twins [letter] *Am J Obstet Gynecol* 1990 Sep;163(3):1100-1
- Delezoide AL** see **Larroche JC**
- Delmore P** see **Park YI**
- Derrick P** see **Hay DA**
- Després JP** see **Bouchard C**
- Detterman DK, Thompson LA, Plomin R:** Differences in heritability across groups differing in ability. *Behav Genet* 1990 May;20(3):369-84
Differences in heritability and environmentality were assessed for 54 DZ and 86 MZ same-sex twin pairs between 6 and 12 years of age from the Western Reserve Twin Project. A principal-component score composed of the subtests of the WISC-R, PPVT, WRAT, and MAT represented each twin's cognitive ability. Using a modification of a regression technique developed by DeFries and Fulker (1985), it was possible to assess differential heritability and environmentality across ability level. A number of variants of this procedure were used and all yielded the same result: lower ability subjects show higher heritabilities and lower shared environmentality. This result is attributable to larger differences between DZ twins at low ability levels and to differences between MZ twins, which are either the same across ability level or are smaller at low ability levels. A possible explanation for this effect is a genotype-environment correlation in which higher-ability persons seek out better environments. The results from this study should be regarded as tentative but the methods used can be applied to other twins studies. Investigators should be aware of the importance of representing the low end of the distribution in their samples.
- Dev V, Pothineni RB, Rohatgi M, Shrivastava S:** Echo-Doppler assessment of cardiac status in conjoined (thoraco-omphalopagus) twins. *Pediatr Cardiol* 1990 Apr;11(2):91-2
Cardiac status was assessed noninvasively in a case of thoraco-omphalopagus conjoined twins by two-dimensional and Doppler echocardiography which showed completely separate hearts and major arteries and veins. The twins were successfully separated surgically, without preoperative invasive cardiac investigation. Echocardiography can provide an accurate assessment of cardiac status in conjoined twins and may obviate the need for cardiac catheterization.
- di Landro A** see **Valsecchi R**
- DiLiberti J** see **Murphy MB**
- DiMauro S** see **Bonilla E**
- Donaldson JS, Luck SR, Vogelzang R:** Preoperative CT and MR imaging of ischiopagus twins. *J Comput Assist Tomogr* 1990 Jul-Aug;14(4):643-6
Each case of conjoint twins is unique. Preoperative imaging is helpful to determine the feasibility of separation. Shared and separate organs can be delineated; and operative technique and problems anticipated. We performed ultrasonography, CT, magnetic resonance imaging, and arteriography preoperatively on ischiopagus conjoint twins. The single most helpful study was CT performed during a bolus intravenous contrast medium injection into one twin. Arteriography was also very helpful. The other studies were complementary but added little additional structural details. Sedation of conjoint twins is complicated yet crucial for optimal imaging

studies. A combination of oral and intramuscular sedation was used and worked well for all of the studies.

Droullé P see **Larroche JC**

Du YR see **Yang HM**

Duffy DL, Martin NG, Mathews JD: Appendectomy in Australian twins [letter] *Am J Hum Genet* 1990 Sep;47(3):590-2

Dussault J see **Bouchard C**

Duvoisin R see **Johnson WG**

Dysken MW see **Kim SW**

E

Eaves LJ, Martin NG, Heath AC: Religious affiliation in twins and their parents: testing a model of cultural inheritance. *Behav Genet* 1990 Jan;20(1):1-22

The transmission of religious affiliation is analyzed in a sample of 3810 Australian twin pairs and their parents. Twins were classified by sex, zygosity, and whether they were living together or apart. Analysis of twin, spousal, and parent-offspring resemblance shows that several different forms of cultural inheritance operate jointly in the transmission of religious affiliation. Model-fitting methods show that (1) the environmental influence of mothers is significantly greater than fathers; (2) there is a substantial amount of assortative mating for religious affiliation; (3) there is a substantial environmental component shared by twins which does not depend on parental religious affiliation; (4) religious affiliation attributed to parents by their children is biased by the religious affiliation of the children; (5) nongenetic effects on the expression of religious affiliation are much greater in twins living together; and (6) a moderate genetic effect on religious affiliation is expressed in females but only when twins live apart. Implications of the method and findings are discussed for other aspects of family resemblance, including the analysis of social and occupational mobility.

Eaves LJ see **Bodurtha JN**

Eaves LJ see **Kendler KS**

Eckert ED see **Grove WM**

Edwards SJ, Yuen HK: An intervention program for a fraternal twin with Down syndrome.

Am J Occup Ther 1990 May;44(5):454-8

Eisen S see **Henderson WG**

Eisen SA see **Goldberg J**

Englund SA, Klein DN: The genetics of neurotic-reactive depression: a reanalysis of Shapiro's (1970) twin study using diagnostic criteria. *J Affective Disord* 1990 Apr;18(4):247-52

The present study explored the role of genetic factors in the development of neurotic depression. Case studies of 16 monozygotic (MZ) and 14 same-sex dizygotic (DZ) twins from Robert Shapiro's 1970 study of non-endogenous depression were re-diagnosed by two raters blind to the zygosity and identity of each twin. Diagnoses were made using Research Diagnostic Criteria (RDC) and George Winokur's 1985 criteria for neurotic-reactive depression. When neurotic depression was operationally defined using Winokur's criteria plus RDC major or definite minor depression, the concordance rate for MZ twins was significantly greater than that for DZ twins. Our results contrast with Shapiro's negative findings, probably due to our use of formal diagnostic criteria and Shapiro's requirement that cotwins be hospitalized to be considered concordant. The present results suggest that genetic factors play a role in the etiology of

AUTHOR SECTION

at least some forms of neurotic depression.

Erskine K see Bunker CB
Evans EG see Simmonds EJ

F

Fabsitz RR see Carmelli D
Fabsitz RR see Havlik RJ
Fabsitz RR see Newman B
Ferguson-Smith MA see Cuckle H
Fielder AR see Bell JA
Filly RA see Barth RA
Fisk N see Fusi L
Floderus B see Thomas DC
Foti P see Zanardo V
Fournier G see Bouchard C
Fraser HS see Grim CE
Fredman G see Stevenson J
Frescura C see Ho SY
Friedman GD see Newman B
Fujita M see Tanaka K
Fujiwara T, Nakamura H, Watanabe M, Yagi K, Seino M, Nakamura H: Clinicoelectrographic concordance between monozygotic twins with severe myoclonic epilepsy in infancy. *Epilepsia* 1990 May-Jun; 31(3):281-6
Clinical features of a pair of monozygotic male twins, both with severe myoclonic epilepsy in infancy (SME), are described. They were almost completely concordant with respect to seizure onset, clinical seizure symptomatology, interictal, and ictal EEG expressions and seizure prognosis. The existence of such twins suggests the possibility that a genetic factor is determinant in the etiology of this particular epileptic syndrome.

Fulker DW see Cyphers LH

Fusi L, Fisk N, Talbert D, Gau G, Rodeck C: When does death occur in an acardiac twin? Ultrasound diagnostic difficulties. *J Perinat Med* 1990; 18(3):223-7

Fetal acardia is a rare abnormality of multiple pregnancies, which is lethal for the affected fetus and can cause death in 50% of normal co-twins. Antenatal recognition with early ultrasound is essential to institute a prospective management to improve the outcome. Our communication outline the difficulties which may be encountered in ultrasound diagnosis. In particular the problem of distinguishing a fetal heart from large pulsating mediastinal vessels, which can be present in these fetuses, and the difficulty of diagnosing death in an acardiac fetus. Our report confirms that the co-twin remains at increased risk of sudden death, even without ultrasound evidence of cardiac failure or biochemical compromise. The finding in this fetus of intravascular fibrin deposits suggests the possibility of acute disseminated intravascular coagulation, not previously reported in association with an acardiac twin.

G

Gabert HA see Brown HL

Gale S see Moore TR

Gau G see Fusi L

Ghanem Q, Dawod S: Monozygotic twins concordant for Rubinstein-Taybi syndrome. *Clin Genet* 1990 Jun;37(6):429-34

Monozygotic twin sisters from Qatar, concordant for the Rubinstein-Taybi syndrome, are described. Skeletal anomalies not previously seen in this syndrome are described. The mode of inheritance

is reviewed.

Gilkes JJ see Bunker CB

Glass L see Kanjilal D

Goetz CG, Tanner CM: Gilles de la Tourette's syndrome in twins: clinical and neurochemical data. *Mov Disord* 1990;5(2):173-5

A pair of identical twins (probability of monozygosity by genetic marking = 99.99%) with Gilles de la Tourette's syndrome (GTS) were studied clinically and neurochemically. The two boys were distinguished within the family by dramatic differences in their behavior and tics. Twin 1 had severe motor tics, loud vocalizations, coprolalia, and school behavior problems, whereas twin 2 was only mildly affected. Neither boy had ever been treated with medication for his tic disorder. Lumbar puncture was performed on each after a night of bed rest. In spite of the marked clinical differences between the two boys, the major indices of dopamine and serotonin turnover in the cerebrospinal fluid were equivalent. Homovanillic acid levels were 65 and 60 ng/ml, respectively, and 5-hydroxyindoleacetic acid levels were 36 and 39 ng/ml. Observation of these twins suggests that the phenotypic expression of GTS relates to more factors than inheritance. Neurochemical metabolites of dopamine and serotonin did not reflect the comparative clinical severity of GTS in these boys.

Goldberg J, Eisen SA, True WR, Henderson WG: A twin study of the effects of the Vietnam conflict on alcohol drinking patterns. *Am J Public Health* 1990 May;80(5):570-4

This study examines the association between military service in Southeast Asia and alcohol drinking patterns in 2,169 male-male monozygotic twin pairs who both served on active military duty during the Vietnam era (1965-75). Data on alcohol drinking were collected in 1987 by mail and telephone interview. The alcohol drinking measures include three indicators of abstinence (lifetime abstainer, lifetime non-regular drinker, and current abstainer) and two indicators of consumption (average daily ethanol consumption and high consumption). In unadjusted and co-twin adjusted analyses, neither service in Southeast Asia nor combat exposure was significantly associated with any measure of abstinence. In the co-twin adjusted analysis, there was no association of Southeast Asia service and combat exposure with average daily ethanol consumption. After adjustment for co-twin effects, 4.0 percent of non-Southeast Asia veterans were high consumers compared to 6.7 percent of Southeast Asia veterans who served in high combat. We conclude that prior military service in a war zone has a relatively modest long-term effect on the alcohol drinking patterns of male veterans.

Goldberg J see Henderson WG

Goldberg JD see Barth RA

Goldberg S see Minde K

Goldberg TE see Casanova MF

Good RA see Young KK

Goodlin RC: Prolongation of pregnancy and survival of second twin [letter] *Am J Obstet Gynecol* 1990 Jul;163(1 Pt 1):270-1

Gottesman II see Berenbaum H

Gough HG see Loehlin JC

Greenberg F see Murphy MB

Grim CE, Wilson TW, Nicholson GD, Hassell TA, Fraser HS, Grim CM, Wilson DM: Blood pressure in blacks. Twin studies in Barbados. *Hypertension* 1990 Jun;15(6 Pt 2):803-9

We have recently reported that there are significant genetic influences on the population variation in

AUTHOR SECTION

blood pressure in black twins in Los Angeles. The present cross-sectional study was undertaken to replicate these findings in a black twin population that lives in a different biosocial environment. We chose the Caribbean island nation of Barbados, where 96% of the population is black, the literacy rate is 99%, and the access to health care is guaranteed. The goals were 1) to test the feasibility of twin studies in blood pressure research in a developing country and 2) to estimate the relative contribution of genes and environment to blood pressure variability in blacks in the Caribbean. The names of 200 twin sets were obtained with the assistance of community resources including a twin club, by media advertisement, and by asking people at public blood pressure screenings if they knew any twins. By using these methods, we identified 200 sets of twins. Of these, 37.5% (75/200) met our criteria for study. Although 97% of the sets of twins (73/75) said they were willing to participate, only 69% (52/75) were able to be scheduled during the 1 week of the study when the full team of investigators was in Barbados. Of those scheduled, 83% (43/52) were examined. Examination included medical history, physical examination, recumbent blood pressure measurements by two observers, anthropometric measurements, 24-hour urine collections for sodium and potassium tests, and blood tests for zygosity. (ABSTRACT TRUNCATED AT 250 WORDS)

Grim CE see **Harshfield GA**

Grim CM see **Grim CE**

Grove WM, Eckert ED, Heston L, Bouchard TJ Jr, Segal N, Lykken DT: Heritability of substance abuse and antisocial behavior: a study of monozygotic twins reared apart. *Biol Psychiatry* 1990 Jun 15; 27(12):1293-304

Thirty-two sets of monozygotic twins reared apart since shortly after birth (31 pairs and one set of triplets; median age at separation was 0.2 years) were interviewed separately and blindly using the Diagnostic Interview Schedule for presence of DSM-III Axis I psychiatric disorders and antisocial personality. Because the sample was recruited from a nonclinical population, predictably few subjects met criteria for such disorders. However, items counting toward diagnoses were cumulated into four scores: alcohol-related problems, drug-related problems, childhood antisocial behavior, and adult antisocial behavior. The scores showed within-scale cohesion as measured by Cronbach's coefficient alpha. The drug scale and both antisocial scales showed significant heritability (p less than 0.1), but the alcohol scale had an estimated heritability of zero (albeit with a broad confidence interval). There appeared to be substantial commonalities in the genetic factors responsible for these traits.

Gupta S: Psychosocial development in a genetic male surgically reassigned as a female at birth. *Am J Psychother* 1990 Apr;44(2):283-9

This paper explores the psychological development of a child who is genetically a boy (Chromosome 46XY). However, because of multiple defects, a decision was made at birth to assign the child the gender status of a girl. Research has shown that the gender-feedback effect resulting from parent-and-infant interaction even at an early age leads to the development of sexual differences in behavior. Based on this conceptual framework, this paper investigates the complex interaction of the forces that shape sexual nature. It examines the process by which this 11-year-old girl is attempting to establish her gender identity. This paper also

explores the conflicts resulting from the discordance between gender and identity, and the expression of this in developmentally regressive behavior and intellectual underachievement.

Gurtler H see **Bønnelykke B**

H

Haddad J, Messer J, Casanova R, Simeoni U, Willard D: Indomethacin and ischemic brain injury in neonates [letter; comment] *J Pediatr* 1990 May; 116(5):839-40

Haldorsen T see **Magnus P**

Hamilton RA see **Crowther CA**

Haran RH see **Prasad CN**

Harris JR see **Stunkard AJ**

Harris MJ see **McCartney K**

Harshfield GA, Grim CE, Hwang C, Savage DD, Anderson SJ: Genetic and environmental influences on echocardiographically determined left ventricular mass in black twins. *Am J Hypertens* 1990 Jul; 3(7):538-43

Genetic and environmental influences on left ventricular mass were examined in normotensive black twins. Left ventricular mass was measured echocardiographically in 7 sets of monozygotic (MZ) and 15 sets of dizygotic (DZ) twins and adjusted for body surface area (LVMI). Regression analyses showed significant effects of gender ($R^2 = 0.48$; P less than .01), systolic blood pressure ($R^2 = 0.21$; P less than .01) and age ($R^2 = 0.10$; P less than .05) on LVMI but did not show an effect for either diastolic blood pressure or caloric expenditure. Monozygotic twins showed smaller within-pair differences (7 +/- 5) than DZ twins (17 +/- 11) for LVMI following adjustment for gender, systolic blood pressure and age (P less than .03). The intraclass correlation for MZ twins was 0.90 (P less than .01) and 0.33 ($P = NS$) for DZ twins. These results indicate that both genetic and environmental factors are important determinants of left ventricular mass in blacks, independent of gender, blood pressure and age.

Hartikainen-Sorri AL, Rantakallio P, Sipilä P: Changes in prognosis of twin births over 20 years. *Ann Med* 1990 Apr;22(2):131-5

The study is based on two birth cohorts from the years 1966 and 1985-1986. Perinatal mortality of twins has fallen over 20 years from 9.2% to 3.1%. Improvement is particularly remarkable in neonatal mortality (less than 28 days) of preterm (less than 34 gestational weeks) twins, from 47.4% to 8.6%, whereas the incidence of stillbirths has not fallen greatly. The proportion of preterm births has not fallen significantly, 48.4% vs. 38.1%. Many factors, considered favourable to the course and outcome of pregnancy have improved simultaneously: women are taller, less overweight, and more educated; pregnancies are wanted and sick and maternity leave provisions have improved. The follow-up of twin pregnancies and deliveries has been centralized and is more effective. In particular, neonatal care is also better than 20 years ago. The prognosis of twins has improved in parallel with the singletons, but the perinatal mortality is still approximately four times and the incidence of prematurity ten times more than in singletons.

Hassell TA see **Grim CE**

Hauge M see **Bønnelykke B**

Havlik RJ, Fabsitz RR, Kalousdian S, Borhani NO, Christian JC: Dietary protein and blood pressure in monozygotic twins. *Prev Med* 1990 Jan;19(1):31-9

AUTHOR SECTION

Cross-sectional studies relating blood pressure to dietary intake have shown equivocal results, in part due to the inability to take into account the strong genetic component of blood pressure. Intervention studies, using the same subject as his own control, often encounter additional problems when subjects are asked to adhere to an alternate diet. The National Heart, Lung, and Blood Institute Twin Study of middle-aged men provided information concerning the possible relationship of food-frequency-estimated nutrient intake to blood pressure while controlling for genetic effects in a free-living group of subjects. Using differences in monozygotic twins, a direct association of dietary protein intake and diastolic blood pressure was identified and persisted after adjustment for known covariates of blood pressure. Adjusting for known covariates and holding total calories constant, a 9-g difference in daily protein intake was directly associated with a 1 mm Hg difference in diastolic blood pressure. For protein intake as a percentage of total calories, a 2.18% difference was directly associated with a 1 mm Hg difference in diastolic blood pressure. The co-twin-control method provides a powerful design to address the interrelationships between nutrients and blood pressure in an observational as well as an experimental setting.

Hawkins DB, Liu-Shindo M, Kahlstrom EJ, MacLaughlin EF: Familial vocal cord dysfunction associated with digital anomalies. *Laryngoscope* 1990 Sep;100(9):1001-4 (10 ref.)

Familial vocal cord dysfunction is a rare condition that has been reported in only a few instances. This is a report of identical male twins, both of whom had congenital bilateral abductor vocal cord paresis associated with finger deformities. The vocal cord paresis progressed to paralysis that required tracheotomy, then returned to a slowly resolving paresis during which the vocal cords had uncoordinated motion generally known as synkinesis. Another male sibling and the mother had a history of stridor during infancy and finger deformities. Several other relatives had digital abnormalities, and an infant first cousin with finger abnormalities required a tracheotomy for vocal cord paralysis.

Hay DA, Clifford C, Derrick P, Hopper J, Renard B, Theobald TM: Twin children in volunteer registries: biases in parental participation and reporting. *Acta Genet Med Gemellol (Roma)* 1990;39(1):71-84

The biases in voluntary participation by adult twins are well known but less attention has been paid to twin children where parents decide on participation and provide much of the information. Several aspects of reporting including the assessment of zygosity are compared in four large Australian data bases: 1) a nationwide compulsory (and hence representative) survey of literacy and numeracy; 2) a nationwide "Twins in School" survey of parents and teachers of twins run through Education Departments and AMBA, the parents organisation in conjunction with LaTrobe; 3) the LaTrobe Twin Study which is a longitudinal program involving frequent interactions between families and researchers, and 4) the Australian NHMRC Twin Registry which has surveyed a large sample of their families with twin children by mail. One potential bias comes when recruitment is on a continuing basis as in the LaTrobe Twin Study and the Australian Twin Registry when differences between "early" and "late" enrolling families arise. One difference between the four samples arose from parents being

much more likely to contrast their twins and to report problems in one but not the other, whereas teachers' and psychologists' assessments of these same children generally reported much smaller intrapair differences. Future studies should have some common questions to provide comparative data on such biases. Key questions are proposed for this area, mainly on the perceived need for different forms of remediation, together with other recommendations about the minimal essential baseline data set for a registry.

Hayakawa K see **Ooki S**

Heath AC see **Eaves LJ**

Heij HA see **Moorman-Voestermans CG**

Hemalatha see **Raghuveer G**

Henderson AS see **Andrews G**

Henderson S see **Andrews G**

Henderson S see **Morris-Yates A**

Henderson WG, Eisen S, Goldberg J, True WR, Barnes JE, Vitek ME: The Vietnam Era Twin Registry: a resource for medical research.

Public Health Rep 1990 Jul-Aug;105(4):368-73

The Vietnam Era Twin Registry consists of 4,774 male-male twin pairs born between 1939 and 1957 with both brothers having served in the United States military during the Vietnam War. The registry was originally developed to provide the best control group for Vietnam-exposed servicemen to study the long-term health consequences of service in Vietnam. Recognizing the potential value of the registry for other areas of medical research, the Department of Veterans Affairs in 1988 opened the registry for use by both VA and non-VA investigators. The existence of centralized VA data bases for deaths and VA hospitalizations will strengthen future followup of the twins. This article describes the characteristics of the registry population and the process for accessing the registry.

Henderson WG see **Goldberg J**

Heston L see **Grove WM**

Hewitt JK see **Bodurtha JN**

Hipkin LJ, Casson IF, Davis JC: Identical twins discordant for Kallmann's syndrome.

J Med Genet 1990 Mar;27(3):198-9

A 20 year old male patient presented with lack of sexual development. On examination he was eunuchoidal and hypogonadal, and olfactory function testing showed he was anosmic.

Biochemical investigations proved he was hypogonadotrophic. Kallmann's syndrome was therefore diagnosed. His appearance was very different from his alleged identical twin who had undergone a normal puberty and had normal plasma testosterone and gonadotrophin levels. However, the twin was hyposmic. Genetic fingerprinting confirmed the twins were identical. Why Kallman's syndrome was incompletely expressed in one of them is unexplained. The parents and a normally menstruating sister had normal olfactory function.

Ho SY, Frescura C, Thiene G: Isomerism of the left atrial appendage and left lung in conjoined twins. *Int J Cardiol* 1990 May;27(2):277-9

A pair of thoracophagus twins with conjoined hearts and livers are described with emphasis on the cardiac anatomy. The heart of one twin had isomerism of the left atrial appendages in association with azygos continuation of the inferior caval vein. Aortic atresia and atrioventricular septal defect was present in the heart of the other twin.

Hodge SE see **Johnson WG**

Hoffman EL, Bennett FC: Birth weight less than 800 grams: changing outcomes and influences of gender and gestation number. *Pediatrics* 1990 Jul;

AUTHOR SECTION

86(1):27-34

Mortality and neurodevelopmental morbidity were compared in two cohorts of neonates with birth weights of less than 800 g. The neonates, born in the years 1977 through 1980 (original cohort) and 1983 through 1985 (current cohort), were patients in the same university intensive care nursery. Mortality was 80% in the original cohort and 64% in the current cohort ($P = .01$). In the current cohort, survival was significantly better for neonates with birth weights of more than 749 g (58% vs 27%; $P = .001$). Survival was also significantly associated with gender and with gestation number (female survival was 48% and male survival was 23%, $P = .003$; singleton survival was 41% and twin survival was 21%, $P = .03$). Prevalence of major central nervous system handicaps did not significantly differ between the two study groups, but severity of handicap was worse for the current study group. Morbidity in the current cohort was most severe for twins (67% with a major central nervous system handicap) and was least severe for singleton girls (4% with a major central nervous system handicap, $P = .002$). Delivery mode appeared to affect outcome. Although there were more nursery admissions and more survivors among neonates with birth weights of less than 800 g during the period 1983 through 1985 compared with the period 1977 through 1980, overall neurodevelopmental morbidity worsened.

Holloway SM, Sofaer JA: Coefficients of relationship by isonymy among the parents of Scottish twins: a test of familial aggregation. *Hum Biol* 1990 Jun; 62(3):429-35

The ability of the coefficient of relationship by isonymy R_i to detect familial aggregation of conditions suspected of being under a degree of genetic control was tested on groups of fathers and mothers of like-sex twins, fathers and mothers of unlike-sex twins, and fathers and mothers of singleton controls born from 1977 to 1981 in Scotland. No statistically significant difference of within-group or between-group R_i was found, either for all surnames or for rare surnames only. However, the overall pattern of results for rare surnames showed a measure of agreement with what is already known of the genetics of twinning. The relatively high within-group R_i for mothers of unlike-sex twins is consistent with a maternal genetic influence on dizygous twinning, whereas the relatively high between-group R_i for fathers with mothers of unlike-sex twins suggests that paternal as well as maternal genes may be involved. Values of R_i for the parents of like-sex twins raise the possibility of a paternal but not a maternal genetic contribution to monozygous twinning.

Holm N see **Bønnelykke B**

Holt P see **Andrews G**

Hopper J see **Hay DA**

Hopper JL: The NHMRC twin registry [letter] *Med J Aust* 1990 Jul 2;153(1):64

Horn JM see **Loehlin JC**

Horne CC see **Wang LN**

Howie P see **Morris-Yates A**

Hoyle RM: Surgical separation of conjoined twins. *Surg Gynecol Obstet* 1990 Jun;170(6):549-62 (146 ref.)

The studies and their sequence should be carefully planned based on the type of fixation, associated anomalies and need for immediate separation. The current excellent outcomes, even in difficult cases of conjoined twinning, suggest that separation should always be considered, with rare exception. Carefully

planned and rehearsed operations approached by a team of surgeons, anesthesiologists and skilled nurses should yield a high success rate in separating conjoined twins who otherwise would lead a life of ridicule and deformity.

Hrubec Z see **Rodvall Y**

Hu BW see **Yang HM**

Huang FY see **Chen CJ**

Huang FY see **Yu MW**

Hughes M see **Murphy MB**

Hwang C see **Harshfield GA**

I

Iacono G, Carroccio A, Montalto G, Cavataio F, Alongi A, Balsamo V, Notarbartolo A: Different clinical presentation of gastroesophageal reflux in twins [letter] *J Pediatr Gastroenterol Nutr* 1990 Jul; 11(1):142

Ieko M, Sakurama S, Sagawa A, Yoshikawa M, Satoh M, Yasukouchi T, Nakagawa S: Effect of a factor VIII concentrate on type IIB von Willebrand's disease-associated thrombocytopenia presenting during pregnancy in identical twin mothers. *Am J Hematol* 1990 Sep;35(1):26-31

Marked thrombocytopenia developed during pregnancy in both identical twins mothers who had systemic lupus erythematosus (SLE) and also type IIB von Willebrand's disease (vWD). The proband's platelet count decreased in the third trimester of pregnancy. Large-dose gamma-globulin and prednisolone treatments were performed because of the suspicion of immune thrombocytopenic reaction associated with SLE. These treatments were not effective. Her platelet count returned to the normal range immediately after delivery. Postpartum examinations revealed the decreased ristocetin cofactor activity and the deficiency of large von Willebrand factor (vWF) multimers in preserved plasma samples from the third trimester. These abnormal findings improved after delivery. Investigation of family members revealed that the proband had inherited type IIB vWD from her mother. The other twin, who was also under treatment for SLE, became pregnant about 1 year after delivery in the proband and followed almost the same course as that observed in the proband. As bleeding tendency was observed a few days before delivery, a factor VIII concentrate (Haemate P) was administered to compete with her variant vWF. This concentrate could prevent the further decrease in her platelet count, thereby correcting the hemorrhagic tendency. It seems evident that factor VII concentrate would be effective in treating thrombocytopenia associated with type IIB vWD.

Ihill-Taylor DC: Diagnosis of Tourette's disorder [letter] *Am J Psychiatry* 1990 Oct;147(10):1386

Ingemarsson I see **Rydström H**

Iroku RO, Anah M: Triplets with conjoined twins.

A Nigerian midwife's case report.

J Nurse-Midwifery 1990 Mar-Apr;35(2):107-9

This article is a case report of a spontaneous vaginal delivery of live triplets, which included conjoined twins joined at the buttocks. The birth was conducted by an experienced midwife in a rural maternity in the Anambra State of Nigeria. The case illustrates the difficulties faced by rural Nigerian midwives when patients need referral to larger hospitals. There is a scarcity of diagnostic equipment, medical back-up, and the transportation that could facilitate an effective referral network. In addition, patients are reluctant to leave their home

AUTHOR SECTION

villages to give birth in a far-away hospital. For these reasons, many difficult births take place in rural maternity centers. The successful outcome of this high-risk delivery demonstrates the skill of the local Nigerian midwife, who is frequently faced with unusual complications of childbirth, ones that she must resolve herself.

Ishida T, Koga M: Cardiovascular anomalies of cephalothoracopagus synotus. A case report and review of the literature of 23 Japanese autopsied cases. *Acta Pathol Jpn* 1990 Feb;40(2):128-36 (33 ref.)

A case of cephalothoracopagus female twins is reported, and the anatomical and pathologic features are described in detail. The central nervous systems were completely double. However, there were three eyeballs, two on the well-formed face and one in the cranial base, forming a saddle-shaped ridge of orbital plates. The latter was supplied by optic nerves of both individuals. On the other hand, there was a single esophagus, stomach and duodenum, but the intestine was shared equally at the jejunum by the two individuals. The larynges, tracheae, lungs, hearts, livers, pancreases, spleens and urogenital organs were also duplicated. Previously unreported abnormalities of the hearts are described, and a comparison with similar autopsy cases reported previously in Japan is given.

J

Jakobi P, Zimmer EZ: Blood sampling and transfusion in utero suggested in the pumping twin [letter; comment] *Am J Obstet Gynecol* 1990 Jun; 162(6):1632-3

Jeffers D see **Minde K**

Jellinek DC see **Blake K**

Johnson WG, Hodge SE, Duvoisin R: Twin studies and the genetics of Parkinson's disease—a reappraisal. *Mov Disord* 1990;5(3):187-94

Parkinson's disease (PD) has long been regarded as having a hereditary component. However, three recent twin studies have been interpreted as excluding any significant genetic component in the etiology of PD. In this article, we reexamine these twin studies and argue that such a conclusion is premature. We review statistical tests of twin concordance rates, including calculation of G , the coefficient of genetic determination. When variation in a trait is due entirely to genetic factors $G = 1$, and when variation in a trait is due entirely to nongenetic factors $G = 0$. We conclude that: (a) low monozygotic concordance rates can be compatible with substantial genetic contribution to etiology; (b) the PD twin study data give substantial optimal values of G (up to 0.78) but the very broad 95% confidence limits for G make it impossible for the twin study data to prove or disprove a substantial genetic component to the etiology of PD; and (c) changing clinical concepts of PD have undermined the assumptions underlying the methodology of the PD twin studies. We review three genetic models that are biologically plausible for PD and are compatible with the low twin concordance rates. Finally, we suggest that further family studies, including linkage studies, are needed to resolve this question.

Jones JS, Newman RB, Miller MC: Sonographic growth measurements in triplet pregnancies [letter] *Obstet Gynecol* 1990 Sep;76(3 Pt 1):477-8

Juntunen J see **Kinnunen E**

Juntunen J see **Kontinen YT**

K

Kahlstrom EJ see **Hawkins DB**

Kaloudian S see **Havlik RJ**

Kambe N see **Tanaka K**

Kanjilal D, Verma RS, Glass L, Babu A, Ramazanoglu F, Popescu S: Congenital adrenal hyperplasia in monozygotic twins with variable clinical manifestations. *Jinrui Idengaku Zasshi* 1989 Sep; 34(3):231-4

The first cases of congenital adrenal hyperplasia III with variable clinical manifestations in female monozygotic twins are presented. Twin "A" revealed severe hypertrophy of the clitoris, labial fusion and a visible introitus. However, twin "B" manifested moderate clitoral hypertrophy, a visible introitus and no labial fusion. Neither infant had palpable gonads.

Kantanen ML see **Kinnunen E**

Kapicioğlu T see **Urgancıoğlu I**

Kaprio J, Koskenvuo M, Rose RJ: Change in cohabitation and intrapair similarity of monozygotic (MZ) cotwins for alcohol use, extraversion, and neuroticism. *Behav Genet* 1990 Mar;20(2):265-76

We have reported cross-sectional evidence that behavioral similarities of adult monozygotic (MZ) cotwins are associated with their age at initial separation and the frequency of their subsequent social interaction (Kaprio et al., 1987; Rose et al., 1988; Rose and Kaprio, 1988). Twins who separated early and twins in infrequent interaction were less alike. Data for those reports came from a 1981 survey of the Finnish Twin Cohort. The Finnish cohort had been surveyed in 1975 with a similar questionnaire, and we now report a longitudinal analysis of the 1975-1981 surveys. All cohabiting MZ cotwins, ages 18-25 at the 1975 baseline, were followed up in 1981, and pairwise similarities at baseline and follow-up were compared for three groups: MZ pairs that remained cohabiting, separated pairs in which the cotwins retained regular contact with one another, and separated cotwins whose social interactions at follow-up were infrequent. For alcohol consumption and EPI Neuroticism scores, relative similarities of the MZ cotwins at follow-up paralleled the relative frequencies of their social contact; baseline differences in resemblance for Extraversion scores preceded follow-up differences in social interaction. These findings clarify the directional nature of associations found in our cross-sectional data and provide new, more compelling evidence of effects of shared experience on sibling resemblance for some dimensions of adult behavior.

These findings clarify the directional nature of associations found in our cross-sectional data and provide new, more compelling evidence of effects of shared experience on sibling resemblance for some dimensions of adult behavior.

Kaprio J see **Teikari J**

Katz S see **Bodurtha JN**

Kempinen P see **Kinnunen E**

Kempinen P see **Kontinen YT**

Kendler KS, Eaves LJ: The estimation of probandwise concordance in twins: the effect of unequal ascertainment. *Acta Genet Med Gemellol (Roma)* 1989;38(3-4):253-70

This report examines the impact of two major kinds of unequal ascertainment on the estimation of true probandwise concordance (Cpbt) in twin studies: 1) concordance-dependent - where the ascertainment rate differs in affected members of concordant vs discordant pairs, and 2) non-independent - where ascertainment rates differ in affected members of concordant pairs where the cotwin has vs has not been ascertained. Concordance-dependent ascertainment is easily modeled algebraically;

AUTHOR SECTION

- non-independent ascertainment is more complex and we here propose a model based on survival analysis. Overall, concordance-dependent ascertainment produces greater bias in estimates of probandwise concordance than does non-independent ascertainment. The bias introduced by concordance-dependent ascertainment is greatest when Cpb_t is low and/or when the ascertainment rate for twins in concordant pairs is low. The bias introduced by non-independent ascertainment is greatest when Cpb_t is high and/or when the ascertainment probability for an affected twin in a concordant pair where the cotwin has already been ascertained approaches unity. The impact of concordance-dependent and non-independent ascertainment on estimates of heritability and common environment is examined. Correction terms to estimate Cpb_t in the presence of concordance-dependent and/or non-independent ascertainment are presented.
- Ketonen L** see **Kinnunen E**
Khan NU see **Chowdhury MK**
Kim SW, Dysken MW, Kline MD: Monozygotic twins with obsessive-compulsive disorder. *Br J Psychiatry* 1990 Mar;156:435-8
King MC see **Newman B**
Kinnunen E, Juntunen J, Konttinen Y, Kempainen P, Ketonen L, Kleemola M, Valle M, Koskimies S, Koskenvuo M: MS and SLE in twins of successive generations. *Acta Neurol Scand* 1990 Mar; 81(3):246-9
 During a nationwide twin study on multiple sclerosis (MS) in Finland a dizygotic pair discordant for MS was found. The affected co-twin had dizygotic twin daughters. The affected co-twin of the second generation had systemic lupus erythematosus (SLE). Both pairs were thoroughly examined. No evidence of CNS involvement in the healthy co-twins was found. In pairwise comparisons, virus-specific IgG antibodies to measles and mumps were significantly increased in the MS patient whereas the same was true for rubella in the SLE patient. Both MS and SLE patient expressed HLA alleles most often found to be associated with these disorders. Reversed CD4/CD8 ratios were observed in both MS and SLE patient. No difference in interleukin-2 receptor expression were found but gamma-interferon secretion in the MS patient showed marked increase whereas that of the SLE patient was of the same magnitude as in the healthy members. A different triggering stimulus rather than the dissimilarity in the immunogenetic predisposition may be decisive as to whether or not they develop MS or SLE.
Kinnunen E, Valle M, Piirainen L, Kleemola M, Kantanen ML, Juntunen J, Klockars M, Koskenvuo M: Viral antibodies in multiple sclerosis. A nationwide co-twin study. *Arch Neurol* 1990 Jul; 47(7):743-6
 Serum viral antibody titers against 21 viruses were studied in 19 of 23 same-sex twin pairs with multiple sclerosis derived from the Finnish Twin Cohort. Thorough neurologic examinations showed two monozygotic pairs to be concordant, whereas all dizygotic pairs were discordant. Special attention was given to measles, mumps, and rubella viruses, against which the antibody levels were determined with the complement fixation, hemagglutination inhibition, hemolysis-*in-gel*, and enzyme immunoassay methods. Epstein-Barr virus antibody levels were determined by enzyme assay. In pairwise comparisons, the measles, mumps, and Epstein-Barr virus-IgG antibody levels were more often elevated in the patients with multiple sclerosis, compared with the healthy co-twins. The same antibody levels were more often above the median in the diseased twin, compared with the healthy twin, but the difference was not significant. No human T-cell lymphotropic virus type I antibodies were found in any of the individuals examined. The total IgG, IgA, and IgM levels did not differ between the diseased and healthy subjects. The HLA types, severity of the disease, and cell-mediated immunity parameters did not influence antibody levels.
Kinnunen E see **Konttinen YT**
Kleemola M see **Kinnunen E**
Klein DN see **Englund SA**
Klein RL see **Wagner DS**
Kline MD see **Kim SW**
Klockars M see **Kinnunen E**
Koga M see **Ishida T**
Konttinen Y see **Kinnunen E**
Konttinen YT, Kinnunen E, Kempainen P, Juntunen J, Koskenvuo M: Lymphocyte activation in discordant multiple sclerosis twin pairs. *J Neuroimmunol* 1990 Apr;27(1):1-8
 Phytohemagglutinin-induced lymphocyte activation sequence was studied in monozygotic and dizygotic discordant multiple sclerosis (MS) twin pairs in a quiescent disease phase. The study group included all available 11 pairs listed in a nation-wide twin register. Lymphocyte activation markers, DNA synthesis and gamma-interferon secretion were studied using avidin-biotin-peroxidase complex (ABC) stainings, [3H]thymidine incorporation, and a solid-phase double-antibody immunoradiometric assay (IRMA), respectively. The level and kinetics of interleukin-2 receptor expression, DNA synthesis, gamma-interferon secretion, and major histocompatibility complex (MHC) locus II antigen expression were similar (Wilcoxon's test for paired samples) in both the diseased and healthy monozygotic and dizygotic twins. Our results suggest that the cell-mediated immune system may not be primarily at fault, but rather that both MS itself and its exacerbations are caused by an unknown triggering stimulus facing a properly functioning immune system.
Koo WW: Tissue accumulation of Al in twins [letter; comment] *JPEN J Parenter Enteral Nutr* 1990 Jan-Feb;14(1):106-7
Koskenvuo M see **Kaprio J**
Koskenvuo M see **Kinnunen E**
Koskenvuo M see **Konttinen YT**
Koskenvuo M see **Teikari J**
Koskimies S see **Kinnunen E**
Kristoffersen K see **Bønnelykke B**
Kubo S see **Motomura M**
Kumar MS see **Prasad CN**
- L**
- Lainelli T** see **Valsecchi R**
Lan CC see **Chen CJ**
Lan CC see **Yu MW**
Langholz B see **Thomas DC**
Larroche JC, Droullé P, Delezoide AL, Narcy F, Nessmann C: Brain damage in monozygous twins. *Biol Neonate* 1990;57(5):261-78
 A series of 15 monozygotic twins with a great variety of cerebral lesions is reported. Seven cases illustrate the classical situation: the recipient twin was affected and his co-twin, the donor was macerated. In 5 cases, the lesions were described in the donor twin as well and once, as early as 22 weeks. The lesions were usually hypoxic-ischemic,

AUTHOR SECTION

in 2 they were hemorrhagic. In 1 case there was a malformation. Fetal US were performed in 11 cases and the diagnosis of either IUGR, death of a fetus and/or brain lesions in the survivor could be made in 10 cases and once as early as 21 weeks. In fetuses born alive, transfontanellar US or CT scan have confirmed the diagnosis made on fetal US. The pathogenesis of the lesions is not fully understood. Lesions in the recipient twin may result from emboli or thrombotic material originating from the macerated co-twin. We suggest that blood pressure instability or episodes of severe hypotension might as well lead to brain and/or visceral lesions in the recipient twin. In the donor, the lesions result from hypotension and/or anemia. With improvement and generalization of imaging techniques, the vitality of the fetuses as well as biometric parameters and anatomical structures will be better controlled. However, in case of a fetal death, occurrence of lesions in the survivor is unpredictable and no uniform policy has been proposed yet. Studies with Doppler and continuous monitoring of funicular circulation should improve our knowledge on fetofetal transfusion and permit to detect hemodynamic fluctuation or impairment.

Laurence KM see **Cuckle H**

Le Couteur A: Autism: current understanding and management. *Br J Hosp Med* 1990 Jun;43(6):448-52 (75 ref.)

Autism is now generally considered to be an organic neurodevelopmental disorder. This review considers the current understanding of genetic factors and associated medical conditions, together with a discussion of some aspects of management and treatment of affected children and adolescents.

Leblanc C see **Bouchard C**

Lee JS see **Chien CH**

Lee TY see **Chen CJ**

Lee TY see **Yu MW**

Li SB see **Yang HM**

Li XL see **Yang HM**

Lichtenstein P see **Plomin R**

Lin T see **Yang HM**

Littlewood JM see **Simmonds EJ**

Liu-Shindo M see **Hawkins DB**

Loehlin JC, Horn JM, Willerman L: Heredity, environment, and personality change: evidence from the Texas Adoption Project. *J Pers* 1990 Mar; 58(1):221-43

Personality changes over time can be analyzed by the same twin and adoption methods used to analyze the genetic and environmental influences on a trait at a given time. Composite parent rating measures of Extra-version, Socialization, and Stability made on two occasions approximately 10 years apart on 229 adopted and 83 nonadopted children from the Texas Adoption Project were used to illustrate this point in two ways. The first was based on correlations among family members, from which it appeared that by far the chief source of individual change was neither the genes nor shared family environment, but individual experience (and/or measurement error). The second was via a path-analytic approach to changes in the means of adopted and natural children, from which it appeared that, nonetheless, the children were tending to change on the average in the direction of their genetic parents' personalities.

Loehlin JC, Gough HG: Genetic and environmental variation on the California Psychological Inventory vector scales. *J Pers Assess* 1990 Summer; 54(3-4):463-8

Three recently introduced vector scales for the

California Psychological Inventory (CPI) were scored for the National Merit Twin Sample and subjected to a heredity-environment analysis. Confidence intervals for genetic and environmental parameters were obtained by a bootstrap method. Two of the scales, Internality (Vector 1) and Self-Realization (Vector 3), showed the substantial heritability and near-zero family environment effects typically found for personality scales, whereas Norm-Favoring (Vector 2) showed an appreciable effect of family environment and a nonsignificant heritability.

Lubs H see **Bauer M**

Lubs ML see **Bauer M**

Luck SR see **Donaldson JS**

Lue HC see **Chen CJ**

Lue HC see **Yu MW**

Lupien PJ see **Bouchard C**

Lykken DT, Bouchard TJ Jr, McGue M, Tellegen A: The Minnesota Twin Family Registry: some initial findings. *Acta Genet Med Gemellol (Roma)* 1990; 39(1):35-70

A birth-record based Registry is nearing completion of some 8,000 pairs of twins born in Minnesota from 1936 to 1955, plus some 1,200 pairs of male twins born 1971-81. The middle-aged twins were recruited with graded incentives so that ease of recruitment could be measured; it was found that pairs concordant for ease of recruitment were no more similar than discordant pairs in education, socioeconomic status (SES), or a variety of personality and interest factors, ie, that selection bias may not be a problem in research with adult twins when contacts are only by mail. A 50% decrease in neonatal mortality from 1936-55 to 1971-81 was associated with an increase from 3.5 to 4.0 per thousand in the frequency of viable MZ twin births. The broad heritability of SES, educational attainment, fecundity, and risk for divorce ranges from 0.30 to 0.50, although all 4 variables are plainly multifactorial and the latter 2 both involve variance contributed by a second person. Investigators interested in making use of this research resource are invited to submit proposals.

Lykken DT see **Grove WM**

M

Ma WG see **Yang HM**

McCartney K, Harris MJ, Bernieri F: Growing up and growing apart: a developmental meta-analysis of twin studies. *Psychol Bull* 1990 Mar;107(2):226-37

Developmental change in twin similarity was examined with age contrasts in a meta-analysis of twin studies from 1967 through 1985. Intraclass rs were coded from 103 papers that included data for monozygotic or dizygotic twins, or for both, on personality or intelligence variables. Analyses indicated that there was a general tendency for some intraclass rs to decrease with age. In other words, as twins grow up, they grow apart. There were also developmental differences associated with components of variance for heritability, the shared environment, and the nonshared environment. Mechanisms through which the nonshared environment may operate are discussed.

McClearn GE see **Bergeman CS**

McClearn GE see **Plomin R**

McClearn GE see **Stunkard AJ**

MacDonald A, Stunkard A: Body-mass indexes of British separated twins [letter; comment] *N Engl J Med* 1990 May 24;322(21):1530

AUTHOR SECTION

- McGue M** see **Lykken DT**
- Machin GA, Still K:** Hydramnios in twin pregnancy [letter; comment] *Am J Obstet Gynecol* 1990 Jun; 162(6):1625-6
- Mack W** see **Thomas DC**
- MacLaughlin EF** see **Hawkins DB**
- Magnus P, Arntzen A, Samuelsen SO, Haldorsen T, Bakketeg LS:** No correlation in post-neonatal deaths for twins. A study of the early mortality of twins based on the Norwegian Medical Birth Registry. *Early Hum Dev* 1990 May;22(2):89-97
- The records of 10,204 pairs of twins born in Norway 1967-84 in the Norwegian Birth Registry were examined. The probabilities of stillbirth, neonatal death and post-neonatal death, conditional on the fate of the cotwin, were calculated. The neonatal death rate was four times increased when the cotwin was stillborn. When the cotwin died neonatally, the probability of postneonatal death was increased ninefold. The concordance rate for stillbirth and for neonatal death was above 0.4. In striking contrast, there was no correlation in postneonatal death for members of a twin pair. This finding suggests that genetic or common environmental factors play a minor role in the aetiology of post-neonatal death.
- Manor RS:** Nonarteritic ischemic optic neuropathy in identical female twins: improvement of visual outcome in one by optic nerve decompression [letter] *Arch Ophthalmol* 1990 Aug;108(8):1067-8
- Martin NG** see **Duffy DL**
- Martin NG** see **Eaves LJ**
- Martin NG** see **Treloar SA**
- Martinielli P, Paladini D, Nicotra A, Russo R, D'Armiento MR:** Holoacardius: antenatal diagnosis and pathogenetic evaluation: a case report. *Eur J Obstet Gynecol Reprod Biol* 1990 Jul-Aug; 36(1-2):153-9
- A case of Holoacardius is reported by the authors. The literature is reviewed, and a pathogenetic sequence responsible for the syndrome is proposed on the basis of the pathologic data.
- Mathews JD** see **Duffy DL**
- May HM** see **Cuckle H**
- Medori R** see **Bonilla E**
- Meltzer HY** see **Arora RC**
- Merikangas KR:** The genetic epidemiology of alcoholism. *Psychol Med* 1990 Feb;20(1):11-22 (80 ref.)
- Despite the variability in sampling and methodology, the majority of the family, twin and adoption studies suggest that alcoholism is familial, a significant proportion of which can be attributed to genetic factors. However, the specific components of alcoholism that may be inherited have yet to be identified. To date, there are no biological trait markers for which there is evidence for specificity for alcoholism. The three major levels of enquiry regarding possible mechanisms for the transmission of alcoholism and the involvement of genes and gene products in its development are factors related to exposure, metabolism, or pharmacological effects of ethanol. Exposure to ethanol is an obvious precondition for the development of tolerance and/or dependence. Therefore, identification of factors which enhance (or decrease) exposure are important goals of studies of the pathogenesis of alcoholism. It is likely that demographic, cultural and environmental factors (i.e. sex, age, religious affiliation, social group influences, income, availability of alcohol, etc.) play a crucial role in mediating exposure to alcohol. The key to alcoholism is likely to reside in the effects of alcohol on the brain. In contrast to nicotine, the opioids, and catecholamines, no specific receptor for ethanol has been found. Thus, one major focus of current research on possible central nervous system (CNS) mechanisms for the effect of alcohol includes assessment of the role of alcohol in the stimulation of brain reward or reinforcement systems. Alternately, alcohol may produce dependence by normalizing abnormal baseline states such as irritability, hyperexcitability, dysphoria, impulsiveness, or stress/tension level. The results of animal studies have yielded information on the central effects of alcohol including sensitivity of neuronal membranes, proteins, and ion channels to alcohol, and factors related to the binding and release of neurotransmitters and neuromodulators including dopamine, norepinephrine, gamma aminobutyric acid, pro-opiomelanocortin, glutamate receptors and the endorphin system (Institute of Medicine, 1987). In addition to possible genetic explanations for the strong degree of familial aggregation of alcoholism, alternative explanations need to be further evaluated. These include: modelling of parental behaviour; possible changes in the susceptibility of the foetus to alcohol as a result of in utero maternal ingestion of alcohol; results of negligent rearing manifested in dietary deficiency, exposure to toxic substances, or brain trauma, which so often characterize the homes of alcoholic parents; or damage to paternal germ cells from alcohol.
- Messer J** see **Haddad J**
- Métneki J, Czeizel A:** Conjoined twins in Hungary, 1970-1986. *Acta Genet Med Gemellol (Roma)* 1989; 38(3-4):285-99
- The total prevalence of conjoined twins (birth + prenatally diagnosed) was 1:68,000 in the study of 1970-1986. Symmetrical cases (the so-called siamese twins) have an obvious predominance (92.3%). Associated major malformations occurred in 80% of conjoined twins and more than 1/5 were discordant. The surviving time of liveborn conjoined twin sets was not more than two days except in two surgically successfully separated pairs. The family study did not indicate a higher recurrence risk. The case group was compared to two control groups and it appeared that the periconceptual use of oral contraception and ovulation induction were mentioned more frequently in pregnancies resulting in conjoined twins.
- Milanesi O** see **Zanardo V**
- Miller JM Jr** see **Brown HL**
- Miller MC** see **Jones JS**
- Millsted P:** Malformations in monozygotic twins—two case histories. *Radiogr Today* 1990 May; 56(636):18-21
- Minde K, Corter C, Goldberg S, Jeffers D:** Maternal preference between premature twins up to age four. *J Am Acad Child Adolesc Psychiatry* 1990 May; 29(3):367-74
- This paper describes methods of measuring a preference a mother develops for one twin over the other and describes the effect such preference has on the intellectual functioning and behavior of 24 twin pairs over 4 years. Results indicate that the majority of mothers develops a preference for one premature twin within 2 weeks after birth and maintains this preference for at least 4 years. The preferred twin has fewer behavior problems and a higher IQ at age 4. However, temperament is not correlated with preferential status.
- Miranda AF** see **Bonilla E**
- Moilanen I, Rantakallio P:** The growth, development and education of Finnish twins: a longitudinal follow-up study in a birth cohort from pregnancy

AUTHOR SECTION

to nineteen years of age. *Growth Dev Aging* 1989 Winter;53(4):145-50

The growth, development and vocation of 289 twins in a one year birth cohort beginning during pregnancy and followed up to the age of 19 years was compared with that of 11,623 singletons and two sets of controls matched either by maternal factors only or by these and perinatal morbidity, all from the same cohort. The twins were more often pre-term and small for their gestational age, and had more often suffered from perinatal asphyxia, neonatal hyperbilirubinaemia and hypoglycemia. They had learned to walk without support later than the singletons and the controls matched only by maternal factors, but this difference did not exist between the twins and the controls also matched by perinatal morbidity. The same kind of result was found when studying the number of words spoken at the age of one year and physical growth at the ages of 1 and 14 years. The twins did not differ significantly from the singletons during their compulsory nine years of primary and secondary schooling. According to the national registers of vocational choices, the twins had applied for admission to further education courses less often than the singletons or their controls matched only by maternal factors, but not when compared with the controls also matched by perinatal morbidity. Logistic regression analysis revealed numerous perinatal or environmental factors having an adverse effect on educational achievements, but the twin situation itself was not shown to have adverse effects. About half of the same-sex twin pairs and one seventh of the opposite-sex pairs had chosen the same vocation, compared with just over 10% similarity between the twins and their controls.

Montalto G see **Iacono G**

Moore P see **Barth RA**

Moorer TR, Gale S, Benirschke K: Perinatal outcome of forty-nine pregnancies complicated by acardiac twinning. *Am J Obstet Gynecol* 1990 Sep; 163(3):907-12

Acardiac twinning affects 1 in 100 monozygotic twin pregnancies and 1 in 35,000 pregnancies overall. The presence of an acardiac twin requires the normal (or "pump") twin to provide circulation for itself, as well as the acardiac sibling. In many cases the acardiac twin is almost equal to the normal twin. The principal perinatal problems associated with acardiac twinning are pump-twin congestive heart failure, maternal hydramnios, and preterm delivery. We reviewed the perinatal courses of 49 acardiac twin pregnancies to identify factors prognostic of favorable outcome. The overall perinatal mortality was 55%, primarily associated with prematurity. Mean (+/- SD) gestational age at delivery was 29 +/- 7.3 weeks, with a mean (+/- SD) normal twin weight of 1378 +/- 1047 gm. The acardiac weight averaged 651 +/- 571 gm. However, the occurrence of hydramnios, the occurrence of preterm labor, and perinatal outcome were strongly related to the ratio of the acardiac and pump-twin's weight. The mean overall ratio of the twin weights was 52% +/- 42%. However, the mean weight ratio for patients delivered before 34 weeks was 60% versus 29% (p less than 0.04). Preterm delivery was strongly associated with the development of hydramnios and congestive heart failure in the pump twin (p less than 0.01). If the twin-weight ratio was above 70% (25% of cases), the incidence of preterm delivery was 90%; hydramnios, 40%; and pump-twin congestive heart failure, 30% compared with 75%, 30%, and 10%, respectively, when the ratio was less (p less than

0.05). Regression of the weight of the acardiac twin against its longest dimension (L) resulted in this equation for prediction of acardiac weight: Weight (grams) = 1.2 L²-1.7L; r = 0.79, p less than 0.01. These data suggest that estimation of the relative weights in acardiac twins provides prognostic information regarding outcome. Poor outcome occurs with congestive heart failure and hydramnios in the normal twin. Use of the above data may assist in counseling patients and determining optimal management.

Moorjani S see **Bouchard C**

Moorman-Voestermans CG, Heij HA, Vos A: Jejunal atresia in twins. *J Pediatr Surg* 1990 Jun;25(6):638-9
In the past 2 1/2 years a sudden increase in the frequency of jejunal atresia in discordant, nonidentical twins was observed. Reported are the details of 11 cases and some reflections on possible pathogenetic mechanisms involved.

Morris-Yates A, Andrews G, Howie P, Henderson S:

Twins: a test of the equal environments assumption. *Acta Psychiatr Scand* 1990 Apr;81(4):322-6
We asked a sample of 343 adult same-sex twin pairs a number of questions about the similarity of their social environment during childhood and early adolescence. A factor analysis of their responses indicated that their common environment was derived from two sources, one being similar treatment "imposed" upon them by their parents, the other being "elicited" by the twins' similar interests and behavior. Monozygotic (MZ) twins reported experiencing more similar "imposed" and "elicited" environments than dizygotic (DZ) twins. The extent of imposed similar treatment received during childhood and early adolescence was unrelated to either MZ or DZ twins' current behavioral similarity, as indicated by absolute intrapair differences in their Neuroticism, Anxiety, and Depression scores. Similar treatment imposed upon MZ twins on the basis of their zygosity alone is therefore not a threat to the validity of the twin method.

Morris-Yates A see **Andrews G**

Moskowitz WB see **Bodurtha JN**

Mosteller M see **Bodurtha JN**

Motomura M, Nakamura T, Nagasato K, Shibayama K, Kubo S, Nakasono I, Tsujihata M, Sonoda S, Yashiki S: HTLV-I associated myelopathy in an identical twin [letter] *Lancet* 1990 Jul 7;336(8706):55

Mrazek DA see **Cyphers LH**

Mukoyoko J see **Samra JS**

Murphy MB, Greenberg F, Wilson G, Hughes M, DiLiberti J: Williams syndrome in twins. *Am J Med Genet Suppl* 1990;6:97-9

Two sets of identical twins with Williams syndrome have been reported previously. We report on 2 additional sets of presumed identical twins with Williams syndrome. All 4 patients had the typical Williams syndrome facial appearance, growth deficiency, and developmental delay. None of the patients had supravalvular aortic stenoses; however, all were diagnosed as having probable distal pulmonary artery stenosis. In the set of twins in which serum calcium was measured, one twin had an elevated serum ionized calcium level. These 2 sets of twins further document the occurrence of Williams syndrome in identical twins. To our knowledge, there are no reported cases of concordance in dizygotic twins. This adds further support to the likelihood that Williams syndrome is a genetic disorder.

AUTHOR SECTION

N

- Nadeau A see Bouchard C
 Nagasato K see Motomura M
 Nagoshi CT see Abdel-Rahim AR
 Nakagawa S see Ieko M
 Nakamura H see Fujiwara T
 Nakamura T see Motomura M
 Nakasono I see Motomura M
 Nance WE see Bodurtha JN
 Nancy F see Larroche JC
 Nelson RP see Young KK
 Nesselrode JR see Bergeman CS
 Nesselrode JR see Plomin R
 Nessmann C see Larroche JC
 Neumann DE see Brown HL
 Newman B, Selby JV, Quesenberry CP Jr, King MC, Friedman GD, Fabsitz RR: Nongenetic influences of obesity on other cardiovascular disease risk factors: an analysis of identical twins. *Am J Public Health* 1990 Jun;80(6):675-8
 The importance of genetic influences on obesity has been emphasized recently. We conducted matched co-twin analyses of 250 pairs of White, male, monozygotic twins from the National Heart, Lung, and Blood Institute (NHLBI) Twin Study. Entirely in the absence of genetic influences, obesity was significantly associated with systolic and diastolic blood pressures; one-hour, post-load glucose; total, LDL-, and HDL-cholesterol; and triglycerides among these 42-55 year old men. Similar results were obtained in longitudinal analyses of weight change during adulthood (from mean age of 20 to mean age of 48 years) and risk factor status at middle-age. These results indicate that behaviors and environmental exposures that occur later in life are responsible, at least in part, for the associations between adult obesity and cardiovascular disease risk, supporting the appropriateness of weight reduction efforts during adulthood.
 Newman RB see Jones JS
 Nicholson GD see Grim CE
 Nicotra A see Martinelli P
 Nielsen J see Bønnelykke B
 Nochimson DJ see Rodis JF
 Norgaard-Pedersen B see Cuckle H
 Notarbartolo A see Iacono G
 Novak RW see Wagner DS

O

- Obhrai MS see Samra JS
 Oddo SM, Ziessman HA: Cholescintigraphy for assessing the separation potential of thoracoomphalopagus twins. *Clin Nucl Med* 1990 Apr;15(4):243-5
 This case report describes the use of cholescintigraphy in the preoperative evaluation of ventrally conjoined twin girls. Sonography and magnetic resonance imaging disclosed an anatomically conjoined heart and a single apparently fused liver. Cholescintigraphy demonstrated that the hepatic system functioned as two independent livers, gallbladders, and biliary drainage systems that were susceptible to separation.
 O'Donnell J see Teikari J
 Ohrländer S see Rydhström H
 Olsen J see Bønnelykke B
 Oltmanns TF see Berenbaum H
 Ooki S, Yamada K, Asaka A, Hayakawa K: Zygosity diagnosis of twins by questionnaire. *Acta Genet Med Gemellol (Roma)* 1990;

39(1):109-15

Subjects were 189 twin pairs, 165 MZ and 24 same-sexed DZ, who entered the junior high school affiliated to Tokyo University (sample T), and 93 twin pairs, 71 MZ and 22 same-sexed DZ, who were registered at Kinki University (sample K). The zygosity was previously identified by many genetic markers, and this study aimed at zygosity diagnosis by questionnaire. The latter included three questions: "How are you alike?", "How often are you mistaken?", and "By whom are you mistaken?". According to the degree, 1-3 points, 1-3 points, and 1-4 points were given for each question, and the sum of the points of each pair of twins was calculated. Zygosity was determined by the sum of points, distributed from 6 to 20. Namely, if the sum was 6-13, the twin pair was considered MZ, and if the sum was 14-20, DZ. More than 90% of twins were diagnosed correctly by use of this cutting point. This result was in accordance with that obtained by use of discriminated function analysis. It is concluded that zygosity diagnosis by questionnaire is convenient and useful, in particular for epidemiological research.

P

- Paladini D see Martinelli P
 Park YI, Delmore P, Bloom BT: Early and late surfactant treatment in preterm triplets. *Kans Med* 1989 Dec;90(12):335-6
 Preterm triplets were treated with calf lung surfactant extract (CLSE). Two were treated at birth without development of respiratory distress syndrome (RDS); one was treated after development of RDS, with rapid improvement. These cases demonstrated the efficacy of exogenous surfactant and the potential benefit of prophylaxis (early treatment) over late treatment. Although various exogenous surfactants have been used successfully to treat or prevent RDS in preterm infants, the optimal time of surfactant treatment has not been established. Surfactant therapy at birth results in a reduction in the incidence and severity of RDS, but it could lead to unnecessary treatment in a significant portion of patients. On the other hand, delaying treatment is likely to lessen the benefits of exogenous surfactant by various factors, including barotrauma and oxygen toxicity. The triplets in this report were treated with Infasurf CLSE. Two were treated at birth without development of RDS, but one was treated after development of RDS, with rapid improvement of respiratory status.
 Patterson RM, Wood RC: What is twin birthweight discordance? *Am J Perinatol* 1990 Jul;7(3):217-9
 The purpose of this study was to define the level of twin birthweight discordance across gestational age at which perinatal morbidity, neonatal death, or congenital anomalies were more likely to occur. One hundred ninety-four sets of twins (1982-1985) were retrospectively studied. Discordance was defined as (birthweight of larger-birthweight of smaller/birthweight of larger) x 100. The mean discordance was 10.3 +/- 8.5% (26 to 32 weeks = 7.6 +/- 5.9%; 33 to 36 weeks = 9.5 +/- 9.5%; 37 to 42 weeks = 11.4 +/- 8.5%) (p = 0.07). The occurrence of morbidity, neonatal death, and anomalies was increased with prematurity or the occurrence of small for gestational age in both twins. However, neither morbidity, neonatal death, nor anomalies were significantly related to level of discordance. These data demonstrate that

AUTHOR SECTION

prematurity and birthweight below the tenth percentile may present a greater threat to twins than does birthweight discordance. These findings should be given due consideration in planning antepartum management.

Pedersen NL see **Bergeman CS**

Pedersen NL see **Plomin R**

Pedersen NL see **Rodvall Y**

Pedersen NL see **Stunkard AJ**

Pershagen G see **Rodvall Y**

Pérusse L see **Bouchard C**

Phillips K see **Cyphers LH**

Piirainen L see **Kinnunen E**

Pinault S see **Bouchard C**

Plomin R, Lichtenstein P, Pedersen NL, McClearn GE,

Nesselroade JR: Genetic influence on life events during the last half of the life span.

Psychol Aging 1990 Mar;5(1):25-30

Genetic influence on perceptions of major events later in life was assessed with a combination of twin and adoption designs as part of the Swedish Adoption/Twin Study of Aging (SATSA). The SATSA design includes 4 groups totaling 399 pairs of same-sex twins: identical and fraternal twins reared apart and matched twins reared together. The average age of the twins was 59 years. The results demonstrate significant genetic influence on reports of the occurrence of life events, especially for controllable events in which the individual can play an active role. Maximum likelihood model-fitting estimates of genetic influence indicate that 40% of the variance of the total life events score is due to genetic differences among individuals. How genetic factors can affect life experiences and directions for future research are discussed.

Plomin R see **Bergeman CS**

Plomin R see **Detterman DK**

Plomin R see **Rende RD**

Popescu S see **Kanjilal D**

Pothineni RB see **Dev V**

Potter RH: Twin half-sibs: a research design for genetic epidemiology of common dental disorders. *J Dent Res* 1990 Aug;69(8):1527-30

Dental caries and the chronic type of periodontal disease are classic examples of common familial diseases that are complex and multifactorial in etiology. Due to previous methodological limitations, there is no information at present on the genetic and shared environmental risks within families that account for familial aggregation of these diseases. Such information, however, is needed in the long run to help specify modifiable family environments that affect the frequency and/or severity of the disease, and thereby to aid in the planning of prevention strategies to be targeted at the family level. Recently, an innovative genetic model has been described to test the genetic and environmental basis of chronic familial diseases in identical (monozygotic) twins, their spouses, and their offspring, who are genetically half-sibs. In this paper, the method is detailed and shown to be appropriate not only for partitioning shared genetic and environmental risks within families, but also for delineating maternal effects and assortative mating as two non-genetic mechanisms that may ultimately be found to affect the incidence of disease.

Prabhakar V see **Prasad CN**

Prasad CN, Haran RH, Prasad GR, Kumar MS,

Prabhakar V: Omphalopagus—successful separation of conjoined twins in the newborn period.

Indian Pediatr 1989 Sep;26(9):953-7

Prasad GR see **Prasad CN**

Purohit CK see **Talsania NJ**

Q

Quesenberry CP Jr see **Newman B**

R

Rafla NM: Surveillance of triplets with umbilical artery velocimetry waveforms.

Acta Genet Med Gemellol (Roma) 1989; 38(3-4):301-4

Doppler arterial velocimetry waveforms was used as a method of antenatal surveillance for triplets. Six sets of triplet pregnancies were studied. Each fetus was identified by real-time-ultrasound scanning and the peak systolic/end diastolic (S/D) ratio was calculated. In one set of triplets two fetuses showed absent end diastolic flow. Both subsequently suffered from necrotising enterocolitis and had major bowel resection. The five other sets of triplets maintained a normal S/D ratio. Three had a normal outcome and two delivered prematurely.

Raghuvveer G, Chinnappa J, Vijayanarayan, Hemalatha: Omphalopagus twins. *Indian Pediatr* 1990 Feb; 27(2):199-202

Ramazanoglu F see **Kanjilal D**

Rantakallio P see **Hartikainen-Sorri AL**

Rantakallio P see **Moilanen I**

Rasmussen P: Precocious puberty in a monozygous twin: report of case. *ASDC J Dent Child* 1990 Mar-Apr;57(2):142-6

This report describes some effects of premature production of sex hormones observed in a boy with precocious puberty. The data presented are compared with corresponding skeletal and oral factors in an unaffected monozygous twin brother.

Renard B see **Hay DA**

Rende RD, Plomin R, Vandenberg SG: Who discovered the twin method? *Behav Genet* 1990 Mar; 20(2):277-85

The twin method is usually credited to Francis Galton's 1875 article on twins. However, Galton did not propose the comparison between identical and fraternal twin resemblance which is the essence of the twin method. Although the twin method was "in the air" in the mid-1920s, the first descriptions of the method appeared in an article by Curtis Merriman and in a book by Hermann Siemens, both in 1924, 50 years after Galton's paper.

Richards LC see **Corruccini RS**

Robinette D see **Carmelli D**

Robinson HB see **Wagner DS**

Rodeck C see **Fusi L**

Rodis JF, Vintzileos AM, Campbell WA, Nochimson

DJ: Intrauterine fetal growth in discordant twin gestations. *J Ultrasound Med* 1990 Aug;9(8):443-8

Twenty-five discordant twin pairs were assessed ultrasonically in a longitudinal fashion and were compared with a group of 60 concordant twin pairs. The growth parameters of the larger fetus of the discordant pair did not differ significantly from the concordant twins, while the smaller of the discordant pair exhibited a slower rate of intrauterine growth as early as 23 to 24 weeks. We conclude that (1) twins who ultimately become discordant exhibit demonstrable differences as early as 23 to 24 weeks; (2) the smaller twin in a discordant pair has a much slower rate of growth between 33 to 37 weeks; and (3) using estimated fetal weight to predict concordancy and discordancy by Shepard's and Hadlock's tables are equally efficacious, although Hadlock's table can be used more often because biparietal diameter cannot be obtained as often as

AUTHOR SECTION

femur length.

Rodvall Y, Pershagen G, Hrubec Z, Ahlbom A, Pedersen NL, Boice JD: Prenatal X-ray exposure and childhood cancer in Swedish twins.

Int J Cancer 1990 Sep 15;46(3):362-5

The association between X-ray exposure in utero and childhood cancer was studied in a case-control study, nested in a national cohort of Swedish twin births. Records of the Swedish Twin Register for those born 1936-1967 ($n = 83,316$) were linked to the Swedish Cancer Register (1958-1983) and the Swedish Cause-of-Death Register (1952-1983). Ninety-five cases of childhood cancer before the age of 16 were identified. Two controls from the Twin Register were matched to each case by sex and year of birth. Maternal X-rays during pregnancy were documented for 41% of the cases and 36% of the controls. The crude relative risk of any childhood cancer associated with any prenatal X-ray was 1.2 (95% CI: 0.7-2.1). For the cases 64% of the X-rayed women had had abdominal X-rays, the numbers for the controls were 57%. Fifty-nine per cent of the X-rayed women had had abdominal X-rays, which were associated with a relative risk for all cancers of 1.4 (CI: 0.8-2.5), leukemias 1.7 (CI: 0.7-4.1) and tumors of the central nervous system 1.5 (CI: 0.5-4.2). There was no apparent confounding by mother's age, drug use, obstetric complications, previous miscarriages, social class or length of pregnancy. The observed relative risks of cancer following prenatal X-ray exposure are consistent with previous studies, suggesting that the developing fetus may be more sensitive to the carcinogenic effects of ionizing radiation than are children irradiated post-natally.

Rohatgi M see **Dev V**

Rose RJ see **Kaprio J**

Rowland LP see **Bonilla E**

Russo R see **Martinelli P**

Rustin MH see **Bunker CB**

Rydström H: Prognosis for twins discordant in birth weight of 1.0 kg or more: the impact of cesarean section. *J Perinat Med* 1990;18(1):31-7

The purpose of this population-based study on twins whose birth weight was discordant by 1.0 kg or more, was to evaluate the impact of abdominal delivery on the "corrected perinatal mortality" (fetal death prior to delivery being excluded), and also on childhood morbidity. Between 1973 and 1983, 277 such discordant twin pairs were identified in Sweden, using the Medical Birth Registry, Stockholm. The original medical records were retrieved for 267 pairs. The presence of childhood morbidity of 437 twins born between 1973 and 1980 was determined by means of questionnaires sent to rehabilitation centers for handicapped children, offices for the Provision of Care to the Mentally Retarded throughout Sweden, as well as to local Boards of Education. No association was found between corrected perinatal mortality figures and a more than 4-fold increase in cesarean section rate, from 11.4% during 1973-75 to 45.9% during 1980-83. The 10 perinatal deaths (1.9%) could be correlated with birth weight (9 small and 1 large twin; $p = 0.01$), but not to the mode of delivery of the smaller twins (6 born vaginally and 3 abdominally; p greater than 0.05). At follow-up, at the age of 8 years or more, 5 smaller and 4 larger twins had cerebral palsy and/or mental retardation; no correlation was found with mode of delivery.

The results of this study show that perinatal death (twins with lethal malformation included) or residual major handicap occurred in one of ten pregnancies

of twins with discordant birth weights. Abdominal delivery seemed to have little impact on either short or long-term outcome.

Rydström H: Prognosis for twins with birth weight less than 1500 gm: the impact of cesarean section in relation to fetal presentation.

Am J Obstet Gynecol 1990 Aug;163(2):528-33

The purpose of this study of twins weighing less than 1500 gm was to evaluate the impact of cesarean section on intrapartum and neonatal mortality, as well as on cerebral palsy and mental retardation. National data held at the Medical Birth Registry was used for identification of cases. The original medical records were retrieved for 862 such twins born between 1973 and 1983. Twins with cerebral palsy and/or mental retardation born between 1973 and 1980 were identified by questionnaires to all rehabilitation centers for disabled children, offices for the Provision of Care for the Mentally Retarded, and to all local Boards of Education throughout Sweden. The analyses, including calculation of relative risk and 95% confidence interval, were performed after stratification for birth weight (250 gm classes) and period of delivery (1973 to 1976, 1977 to 1980, 1981 to 1983). The cesarean section rate increased from 7.7% (1973 to 1976), and 40.5% (1977 to 1980) to 68.9% (1981 to 1983).

Concomitantly, intrapartum and neonatal mortality decreased markedly (51.7% to 29.1%) particularly for twin II but to a much lesser extent for twin I. The relative risk for intrapartum and neonatal mortality (vaginal/abdominal birth) did not increase significantly for twin I in vertex presentation (relative risk 2.0, 95% confidence limits 0.9 to 4.3), for twin I in breech presentation (relative risk 1.8, 95% confidence limits 0.7 to 4.3), for twin II in vertex presentation (relative risk 0.6, 95% confidence limits 0.2 to 1.6), or for twin II in breech presentation (relative risk 1.5, 95% confidence limits 0.7 to 3.0).

The rate of cerebral palsy and/or mental retardation was 8.8% during 1973 to 1976 and 8.0 during 1977 to 1980 ($\chi^2 = 0.1$, p greater than 0.05). For twins born in breech presentation the handicap rate in the first period (cesarean section rate 6.0%) was the same as in the second period (cesarean section rate 59.6%). The analysis failed to reveal any significant impact of abdominal birth on the fetal outcome for low-birth-weight twins, even when fetal presentation was taken into consideration.

Rydström H, Ingemarsson I, Ohrlander S: Lack of correlation between a high cesarean section rate and improved prognosis for low-birthweight twins (less than 2500 g). *Br J Obstet Gynaecol* 1990 Mar; 97(3):229-33

The impact of birth by caesarean section on perinatal mortality was estimated for 9368 low-birthweight twins (less than 2500 g) born in Sweden between 1973 and 1985, by using national data from the Medical Birth Registry, National Board of Health and Welfare, Stockholm. During this period the caesarean section rate increased from 7-10% to 45-50% while concomitantly a sharp decrease in the perinatal mortality rate occurred. A causal relation between the increased rate of abdominal delivery and the improved prognosis for low birthweight twins might be expected. However, analysis of the results failed to show any correlation between these two variables. Factors other than route of delivery seem to have a greater impact on fetal outcome.

AUTHOR SECTION

S

- Sagawa A** see **Ieko M**
Sakurama S see **Ieko M**
Samra JS, Spillane H, Mukoyoko J, Tang L, Obhrai MS: Caesarean section for the birth of the second twin. *Br J Obstet Gynaecol* 1990 Mar;97(3):234-6
 Twin pregnancies delivered after 28 weeks gestation between 1980 and 1988 were reviewed. Of 510 twin pregnancies, 184 (36%) were delivered by caesarean section. There were 22 (4.3%) combined vaginal/abdominal deliveries which comprised 12% of the 184 twin pregnancies delivered by caesarean section. Persistent transverse lie or a high breech presentation was the commonest indication for caesarean section for the second twin.
- Samuelson SO** see **Magnus P**
Sanders RD see **Casanova MF**
Sarpong DF see **Brown HL**
Satoh M see **Ieko M**
Savage DD see **Harshfield GA**
Sawai SK see **Carlan SJ**
Sayman HB see **Urgancioglu I**
Schieken RM see **Bodurtha JN**
Segal N see **Grove WM**
Seino M see **Fujiwara T**
Selby JV see **Newman B**
Shen EY: Dandy-Walker syndrome: follow up of an unoperated case and her identical twin. *Acta Paediatr Sin* 1989 Nov-Dec;30(6):422-7
 A child who had the Dandy-Walker syndrome along with her healthy twin sibling were followed regularly for a period of 2 years. Both of the twins had normal development regarding the fine motor movements and social adaptation. The main neurological defect on the affected twin was a severe hearing loss clinically and reduced responses on auditory brainstem evoked potential examination. We present this rare instance in which Dandy-Walker syndrome involved discordantly in only one of a set of identical twins.
- Shiao LC** see **Wang LN**
Shibayama K see **Motomura M**
Shrivastava S see **Dey V**
Silverman NH see **Barth RA**
Simeoni U see **Haddad J**
Simmonds EJ, Littlewood JM, Evans EG: Allergic bronchopulmonary aspergillosis [letter; comment] *Lancet* 1990 May 19;335(8699):1229
Sims EA: Destiny rides again as twins overeat [editorial; comment] *N Engl J Med* 1990 May 24; 322(21):1522-4
Sipilä P see **Hartikainen-Sorri AL**
Sofaer JA see **Holloway SM**
Sonoda S see **Motomura M**
Spaas PG, Bagshaw MA: Prostate cancer occurring in identical twins: a case report. *Prostate* 1990; 16(3):219-23
 Prostatic cancer, which is an age-associated and androgen-dependent cancer, is the most common malignancy in males in the United States. Although the etiologic factors in prostate cancer are not clear, increased male sexual activity on a hormonal basis, a viral-venerical connection, and air pollution have been hypothesized. Genetic factors are suggested by racial variation and by familial incidence of prostate cancer; however, with family studies alone, it is not possible to decide if it is genetically determined or if it is due to a greater than average similarity in environment. For cancer in general, the study of concordance rates among populations of twins has failed to establish a precise role for inheritance, but more detailed study of individual types of tumors in twins may reveal a genetic connection. The following report describes the second recorded monozygotic twin set concordant for prostate cancer.
- Spillane H** see **Samra JS**
Stellin G see **Zanardo V**
Stevenson J, Fredman G: The social environmental correlates of reading ability. *J Child Psychol Psychiatry* 1990 Jul;31(5):681-98
 The influences of social and family characteristics on individual differences in reading and spelling ability and IQ were investigated for 550 twin children aged 13 yrs. Measures of family social circumstances, parental background, the emotional atmosphere at home and the family's reading behaviour were used as predictor variables in multiple regression analyses with reading, spelling and IQ as dependent variables. There were consistent relationships between many of these measures and the dependent variables. The findings are compared to a previous biometrical genetic analysis of the same data set. It is concluded that the results are within the limits predicted by the genetic analysis. Most of the effect of these environmental influences on children are general, i.e. related to IQ, and not specifically related to reading. After controlling for the effects of IQ on reading, only family size and some aspects of parent-child relationships were significant predictors of reading ability.
- Stevenson JD** see **Cuckle H**
Stewart G see **Andrews G**
Still K see **Machin GA**
Stunkard A see **MacDonald A**
Stunkard AJ, Harris JR, Pedersen NL, McClearn GE: The body-mass index of twins who have been reared apart [see comments] *N Engl J Med* 1990 May 24; 322(21):1483-7
 To assess the relative importance of genetic and environmental effects on the body-mass index (weight in kilograms divided by the square of the height in meters), we studied samples of identical and fraternal twins, reared apart or reared together. The samples consisted of 93 pairs of identical twins reared apart, 154 pairs of identical twins reared together, 218 pairs of fraternal twins reared apart, and 208 pairs of fraternal twins reared together. The intrapair correlation coefficients of the values for body-mass index of identical twins reared apart were 0.70 for men and 0.66 for women. These are the most direct estimates of the relative importance of genetic influences (heritability) on the body-mass index, and they were only slightly lower than those for twins reared together in this and earlier studies. Similar estimates were derived from maximum-likelihood model-fitting analyses--0.74 for men and 0.69 for women. Nonadditive genetic variance made a significant contribution to the estimates of heritability, particularly among men. Of the potential environmental influences, only those unique to the individual and not those shared by family members were important, contributing about 30 percent of the variance. Sharing the same childhood environment did not contribute to the similarity of the body-mass index of twins later in life. We conclude that genetic influences on body-mass index are substantial, whereas the childhood environment has little or no influence. These findings corroborate and extend the results of earlier studies of twins and adoptees.
- Stunkard AJ** see **VanTallie TB**
Suddath RL see **Casanova MF**
Swan GE see **Carmelli D**

AUTHOR SECTION

T

Takashima S see **Tanaka K**

Talbert D see **Fusi I**

Talsania NJ, Purohit CK: A study of twin births in rural communities of Gujarat. *Indian Pediatr* 1990 Mar;27(3):276-9

The incidence and the factors that influence twinning were studied in six villages of Dholka Taluka, a rural field training centre. The twinning rate was 10.10 per 1000 maternities. The monozygotic and dizygotic twinning rates were 4.53 and 5.56, respectively by applying Weinberg's differential formula. In three fourths of the twin births, both twins were of same sex while in one fourth, they were of opposite sex. The twinning rates increased significantly with increase in parental age and pregnancy order of mother.

Tanaka K, Kambe N, Fujita M, Ando Y, Takashima S, Yuasa I: Incontinentia pigmenti in identical twins with separate skin and neurological disorders. *Acta Derm Venereol (Stockh)* 1990;70(3):267-8

Incontinentia pigmenti in female identical twins is reported. The first baby showed the typical pigmentation of incontinentia pigmenti, while the second baby had hydrocephalus (colpocephaly) without pigmentation. They were identical, with a rate of 99.9% in 18 blood-type studies. Virus was not detected and cytogenetic studies proved normal. Both showed peripheral eosinophilia. The individual expressions of Incontinentia pigmenti in these identical twins were separated into cutaneous lesions and lesion of the central nervous system (intra-uterine hydrocephalus). Cutaneous lesions developed after birth. Twins with Incontinentia pigmenti are extremely rare and in this family showed different expressions of this disease in space and time.

Tang L see **Samra JS**

Tanner CM see **Goetz CG**

Tantravahi U see **Bonilla E**

Tariverdian G: Follow-up of monozygotic twins concordant for the Rett syndrome. *Brain Dev* 1990; 12(1):125-7

The clinical features and follow-up of monozygotic twins with the Rett syndrome (RS) are described. The twins are almost concordant in all clinical signs. This identity indicates a genetic cause of RS. A clinical follow-up confirmed the diagnosis.

Teikari J, Koskenvuo M, Kaprio J, O'Donnell J: Study of gene-environment effects on development of hyperopia: a study of 191 adult twin pairs from the Finnish Twin Cohort Study.

Acta Genet Med Gemellol (Roma) 1990;39(1):133-6

The Finnish Twin Cohort material was used to estimate genetic and environmental effects in the etiology of hyperopia (farsightedness). All twin pairs in the cohort born before year 1927 (age 60 years and over at the time of the study), with both members alive, were sent a questionnaire. The questionnaire included questions of past and present eye diseases, visits to ophthalmologists, use of glasses and other vision-related questions. The hyperopia was assessed by asking the patients to send their last prescription for glasses to the authors. Twins with any eye disease affecting refraction (cataract, corneal damage), operation or trauma to their eyes were discarded from the present study. In 191 pairs (80 monozygotic and 111 dizygotic pairs) one or both members of the pair had a hyperopic refractive error. The correlations of refraction between right and left eyes of both MZ and DZ pairs were high (Spearman

Rank Correlations of 0.86-0.89). The intrapair correlations among MZ pairs were higher (0.44 for right and 0.45 for left eyes) than intrapair correlations among DZ pairs (0.24 for right and 0.15 for left eyes). The variances were not significantly different among MZ and DZ pairs. The classical analysis of heritability gave an estimate of 0.75 for hyperopia. The result suggests that genetic factors are important in hyperopia and especially in hyperopia of higher degree.

Tellegen A see **Lykken DT**

Theobald TM see **Hay DA**

Thériault G see **Bouchard C**

Thiene G see **Ho SY**

Thomas DC, Langholz B, Mack W, Floderus B: Bivariate survival models for analysis of genetic and environmental effects in twins. *Genet Epidemiol* 1990;7(2):121-35

Classic methods in genetics for the analysis of binary attributes, based on an assumption of a "threshold" on a normally distributed latent variable called "liability," estimate the strength of genetic and environmental effects from differences in correlations between relatives of differing genetic relatedness. Two problems that are not easily addressed by these methods are the need to take the age of onset into account (particularly in chronic diseases in which incidence rates vary considerably with age and the lengths of time at risk can vary between individuals) and the desirability of incorporating measured covariates (genetic or environmental). The standard methods of cohort analysis used in epidemiology allow for both of these features, but until recently have been restricted to independent individuals. Recent developments in survival analysis have extended the widely used "proportional hazards" model of Cox by the addition of latent variable, epsilon, reflecting the shared susceptibility of related subjects because of their shared genes or shared environment. We show how this approach can be combined with more traditional models of gene-environment interaction to allow the main effects of measured genetic markers and environmental variables to be estimated, as well as the residual variance of genetic and environment and their interactions. The approaches are applied to a cohort of female twin births in Sweden from 1886 to 1958, linked with the Swedish cancer registry from 1961 to 1982.

Thompson LA see **Detterman DK**

Thorp JM Jr, Chescheir NC: Treatment of twins with hydramnios [letter; comment]

Am J Obstet Gynecol 1990 Jun;162(6):1625

Tien M see **Chen CJ**

Tien M see **Yu MW**

Tong SL see **Chen CJ**

Tong SL see **Yu MW**

Torgersen S: Comorbidity of major depression and anxiety disorders in twin pairs. *Am J Psychiatry* 1990 Sep;147(9):1199-202

The relationship among major depression only, major depression with anxiety disorders, and anxiety disorders only was investigated in a twin sample (N = 177 pairs). The results suggest that there is an etiological relationship between mixed major depression-anxiety disorders and major depression only but no relationship between these two conditions and anxiety disorders only. When anxiety disorders with panic attacks were analyzed, the relationship between mixed cases and major depression only and the lack of a relationship between mixed cases, major depression only, and anxiety disorders only became even clearer.

AUTHOR SECTION

Furthermore, mixed cases seemed to be more strongly influenced by genetic factors than was major depression only.

Torrey EF see **Casanova MF**

Townsend GC see **Corruccini RS**

Traisman ES, Traisman HS: Hyperthyroidism in identical adolescent male twins.

J Adolesc Health Care 1990 Mar;11(2):173-5
Monozygous adolescent male twins with hyperthyroidism are presented. One twin had associated thyroiditis. The other twin presented with muscle weakness and paralysis. Treatment was successful with antithyroid medication and levothyroxine.

Traisman HS see **Traisman ES**

Treloar SA, Martin NG: Age at menarche as a fitness trait: nonadditive genetic variance detected in a large twin sample. *Am J Hum Genet* 1990 Jul;47(1):137-48
The etiological role of genotype and environment in recalled age at menarche was examined using an unselected sample of 1,177 MZ and 711 DZ twin pairs aged 18 years and older. The correlation for onset of menarche between MZ twins was .65 +/- .03, and that for DZ pairs was .18 +/- .04, although these differed somewhat between four birth cohorts. Environmental factors were more important in the older cohorts (perhaps because of less reliable recall). Total genotypic variance (additive plus nonadditive) ranged from 61% in the oldest cohort to 68% in the youngest cohort. In the oldest birth cohort (born before 1939), there was evidence of greater influence of environmental factors on age at menarche in the second-born twin, although there was no other evidence in the data that birth trauma affected timing. The greater part of the genetic variance was nonadditive (dominance or epistasis), and this is typical of a fitness trait. It appears that genetic nonadditivity is in the decreasing direction, and this is consistent with selection for early menarche during human evolution. Breakdown of inbreeding depression as a possible explanation for the secular decline in age at menarche is discussed.

Tremblay A see **Bouchard C**

Trevisanuto D see **Zanardo V**

True WR see **Goldberg J**

True WR see **Henderson WG**

Tsai WY see **Chien CH**

Tsujihata M see **Motomura M**

U

Urgancioglu I, Kapicioglu T, Vardareli E, Sayman HB: Observation of hepatobiliary systems in joined twins by Tc-99m EHIDA. *Clin Nucl Med* 1990 Apr;15(4):273-4

V

Valle M see **Kinnunen E**

Valsecchi R, Bontempelli M, di Landro A, Barcella A,

Lainelli T: Familial lichen planus [letter]

Acta Derm Venereol (Stockh) 1990;70(3):272-3

Vandenberg SG see **Abdel-Rahim AR**

Vandenberg SG see **Rende RD**

VanItallie TB, Stunkard AJ: Using nature to understand nurture [editorial]

Am J Public Health 1990 Jun;80(6):657-8

Vardareli E see **Urgancioglu I**

Vaughn V see **Carlan SJ**

Verma RS see **Kanjilal D**

Vijayanarayan see **Raghuveer G**

Viney S see **Bell JA**

Vintzileos AM see **Rodis JF**

Vitek ME see **Henderson WG**

Vogelzang R see **Donaldson JS**

Vos A see **Moorman-Voestermans CG**

W

Wagner DS, Klein RL, Robinson HB, Novak RW: Placental emboli from a fetus papyraceous.

J Pediatr Surg 1990 May;25(5):538-42

A syndrome in monozygotic twins that consists of a macerated twin fetus (fetus papyraceous) and a live-born twin with various anatomical defects has been described. The etiology is thought to be placental transfer of emboli or thromboplastic material through vascular shunts. Thromboplastic material precipitates disseminated intravascular coagulation (DIC) in the fetus, with a resultant hypercoagulable state due to relative fetal antithrombin III deficiency. Two cases of this syndrome will be discussed. The case of a live-born twin with intestinal atresia, who developed in utero with a fetus papyraceous, is reported. Emboli were demonstrated in vascular shunts of the diamniotic-monochorionic placenta. The hypothesis of intestinal atresia as a result of a vascular accident is reviewed. Another case involving a live-born twin with congenital skin defects, who developed in utero with a fetus papyraceous, is also reported. The skin defects were a congenital disruption from fetal DIC with resultant hypercoagulable state. Several other manifestations of the placental emboli syndrome will be discussed and the vascular etiology of the disruptions explained.

Wai L see **Chowdhury MK**

Wald N see **Cuckle H**

Wan M see **Cheung A**

Wang CJ see **Chen CJ**

Wang CJ see **Yu MW**

Wang LN, Wang YF, Horne CC, Shiao LC: Congenital rubella infection: escape of one monozygotic twin from two amnions, one chorion, and single placenta. *Taiwan J Hsueh Hui Tsa Chih* 1990 Jan;89(1):30-3
We report a 2 amnions, 1 chorion, single placenta, monozygotic identical twins, who were born by a mother with a subclinical rubella infection during the gestation; one twin had a congenital rubella infection, the other escaped from it. Both twins were premature and small for their gestational age at birth. They both had an intraventricular hemorrhage ascribed to prematurity. One had a strong positive rubella IgM antibody for more than 3 months and a persistent IgG antibody for more than 1 year. The other had a fading rubella IgG antibody within 3 months, and a negative IgM. The baby with the congenital infection of rubella did not have a defective appearance, but the auditory brain stem evoked potential test showed abnormal findings. In monozygotic identical twins, vessel communication usually exist and the escape of a twin from rubella is a rare condition; there have been only two such events reported in the English literature.

Wang TR see **Chien CH**

Wang YF see **Wang LN**

Warburton D see **Bonilla E**

Ward AM see **Cuckle H**

Watanabe M see **Fujiwara T**

Wedel M see **Cattanach SA**

Weinberger DR see **Casanova MF**

Weller MP: Left handedness in an identical twin discordant to his co-twin for handedness and schizophrenia, with neurological and psychometric

AUTHOR SECTION

evidence of left hemisphere damage.
 Postgrad Med J 1990 Mar;66(773):224-6
 A left handed, monozygotic, male twin developed schizophrenia, whilst his right handed brother was free of psychopathology. There was no family history of mental illness or left handedness. The affected twin had left side motor weakness and an EEG showed scattered irregularities, particularly on the left. Psychometry indicated left sided tempero-parietal dysfunction. The relationship between left temporal lobe damage and schizophrenia is considered.

White S see **Cattanach SA**

Willard D see **Haddad J**

Willerman L see **Loehlin JC**

Wilson DM see **Grim CE**

Wilson G see **Murphy MB**

Wilson PT: A study of twins with special reference to heredity as a factor determining differences in environment. 1934 [classical article] *Hum Biol* 1989 Oct-Dec;61(5-6):629-59; discussion 660-5

(**Wilson PT**), **Wilson PT:** A study of twins with special reference to heredity as a factor determining differences in environment. 1934 [classical article] *Hum Biol* 1989 Oct-Dec;61(5-6):629-59; discussion 660-5

Wilson TW see **Grim CE**

Wood RC see **Patterson RM**

Y

Yagi K see **Fujiwara T**

Yamada K see **Ooki S**

Yang HM, Ma WG, Lin T, Zhao SX, Hu BW, Du YR, Li SB, Li XL: Zygosity in two cases of triplet. *Chin Med J [Engl]* 1990 Apr;103(4):319-23

A total of 11 techniques including 57 items for zygosity diagnosis was employed in two sets of triplet. Namely, placenta-fetal membrane, LDH isoenzymes, etc. The authors made an investigation in detail on the pedigree history of polyembryony and systematic analysis of two sets of male triplets. The conclusion was that the first triplet came from a single ovum, whereas the second triplet developed from double ova. Different methods for the zygosity diagnosis were discussed. It was considered that there was hereditary influence in the occurrence of triplets developing either from a single ovum or from multiple ova.

Yang KH see **Chen CJ**

Yang KH see **Yu MW**

Yashiki S see **Motomura M**

Yasukouchi T see **Ieko M**

Yoshikawa M see **Ieko M**

Young KK, Nelson RP, Good RA: Discordant human immunodeficiency virus infection in dizygotic twins detected by polymerase chain reaction.

Pediatr Infect Dis J 1990 Jun;9(6):454-6

Young M see **Cattanach SA**

Younger DS see **Bonilla E**

Yu MW, Chen CJ, Wang CJ, Tong SL, Tien M, Lee TY, Lue HC, Huang FY, Lan CC, Yang KH, et al: Chronological changes in genetic variance and heritability of systolic and diastolic blood pressure among Chinese twin neonates.

Acta Genet Med Gemellol (Roma) 1990; 39(1):99-108

In order to examine the chronological changes in genetic variance and heritability of arterial systolic and diastolic blood pressure (SBP and DBP) of Chinese infants in Taiwan, a total of 339 same-sexed twin neonates born in four major general teaching

hospitals in Taipei City were studied. Based on placentation and 12 red blood cell antigens, 274 monozygotic (MZ) and 65 dizygotic (DZ) twin pairs were identified and followed up to the age of one year. Both SBP and DBP were measured by Doppler blood pressure monitor. Within-pair mean squares of SBP and DBP were consistently smaller in MZ than DZ twins at ages one month and over. The findings remained unchanged after the adjustment for the effects of age, sex, gestational age, placentation and physical state during blood pressure measurement. Falconer's heritability indices for adjusted SBP and DBP at ages two months and over ranged from 0.29 to 0.55 and from 0.27 to 0.45, respectively. The study indicates an important genetic influence on blood pressure during infancy.

Yu MW see **Chen CJ**

Yuasa I see **Tanaka K**

Yuen HK see **Edwards SJ**

Z

Zambon P see **Zanardo V**

Zanardo V, Foti P, Trevisanuto D, Zambon P, Stellin G, Milanesi O: Does the respiratory distress syndrome in twins and singletons run different risks of persistent ductus arteriosus?
Acta Genet Med Gemellol (Roma) 1989; 38(3-4):315-8

The incidence and evolution of patent ductus arteriosus (PDA) was evaluated in twins and preterm singletons with birth weight less than or equal to 1750 g admitted to our Department in 1987 for respiratory distress syndrome (RDS). Screening by echocardiography and Doppler-flow studies (AT MK 600) was performed on the third day of life. Out of 91 neonates who needed intubation and ventilation during this 12-month period (23.8% of admissions), 40 weighed less than 1750 g and of these 40, 14 were twins (35%). Hemodynamically significant PDA was documented in 13 patients; of these, only 5 were preterm singletons and 8 were twins. Two twins weighing less than 1000 g received no therapy for ductus closure; one ductus closed spontaneously, the other had an early demise. Three twins and 2 preterm singletons received indomethacin; one of the twins needed a second cycle for definitive ductus closure. Three twins and three preterm singletons underwent surgery, while one twin died on the 10th postoperative day. Screening and early therapy of PDA during RDS could be of great clinical importance. Twinning seems to play a role in the incidence and evolution of PDA and this needs to be evaluated in further studies.

Zhao SX see **Yang HM**

Ziessman HA see **Oddo SM**

Zimmer EZ see **Jakobi P**

Zito M see **Casanova MF**