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Outcome of Twin Pregnancy



Towards a Normalization of the Outcome of Twin Pregnancy

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During 1973/1978, more than 90% of the pregnant women in Malmö, Sweden, were examined by ultrasound to improve the early diagnosis of twin pregnancy. This screening programme detected 90% of the twin pregnancies delivered during this period, 105 were subjected to a preventive treatment with bed rest in hospital, usually from the 29th to the 37th week (mean: 55 days). This study evaluates the outcome of these pregnancies, compared with those not treated with bed rest and with all twin pairs born a decade earlier (1963/1965). All twins of this group born up to 1 May 1977 were also monitored by regular postpartum check-ups until at least 18 months of age. Perinatal mortality was reduced to 0.5% in the group with bed rest, but remained as high (8%) as ten years earlier in the group without bed rest. The bed rest group, compared with the group without bed rest and the group of twins born 1963/1965, also showed a significantly reduced frequency of deliveries before the 37th week; also, the incidence of twins born light-for-gestational age and with birth weight below 1500 g was reduced. The incidence of twins born with cerebral palsy, mental retardation, and late development was 3% in 1973/1977 and 8.1% in 1963/1965. The reduction of mortality and morbidity of twins paralleled the improved obstetric and neonatal care. The fact that perinatal mortality and preterm delivery were reduced only among twins subjected to special antenatal supervision suggests that large gains are to be made by early detection and antenatal hospitalization. The lower CNS morbidity provides evidence of the quality improvement among the twin survivors.

Key words: Twin pregnancy, Ultrasound, Early diagnosis, Bed rest, Perinatal mortality

INTRODUCTION

Immature birth affects neonatal mortality [9]. The high frequency of preterm terminations of twin pregnancies results in higher mortality figures for twins than for singletons [14], although the mortality rate for each gestational week is equal [1]. Bed rest is said to prevent preterm delivery [3, 6, 7]. Preventive treatment of twin pregnancies with bed rest could be expected to reduce perinatal mortality [5–8]. The contradictory reports on the results of bed rest presumably derive from the fact that hitherto twin detection was insufficient: the twins detected early in gestation and subjected to bed rest were probably the largest and most well-nourished fetuses, but most were detected too late for any measures to achieve results.

A general screening of the entire population for twin pregnancy is a prerequisite for early diagnosis and extensive hospitalization of women with twin pregnancies. Large-scale ultrasound examination has so far proved superior to any other screening method. The present study evaluates the outcome of twin pregnancies detected in the second trimester and treated with bed rest in hospital; emphasis is placed on the duration of pregnancy and the perinatal mortality. The further development of these twins, with special reference to major neurological handicaps, is also studied.

PATIENTS AND METHODS

The study is based on 136 twin pairs born between 1/1/73 and 31/12/78. During this period, 16,000 children were delivered at the University Hospital in Malmö. A total of 90% of the twins were detected early in gestation and 105 women accepted the preventive programme with bed rest. They constitute study group A. As no conventional control group could be formed, comparisons are made with 31 women (study group B) who did not accept the preventive programme or whose twin pregnancy was not detected until late in gestation. As this group cannot be considered completely free from bias, comparisons are also made with the 93 twin pairs born at the same maternity hospital during 1963/1965, ie, study group C.

All women were referred for ultrasonic screening on their first attendance at the antenatal clinic. The examinations were initially performed in the 28th week. It soon proved desirable to perform the screening as early in gestation as practical and this reduced the average gestational age for ultrasonic screening to 17 weeks.

After the diagnosis of multiple pregnancy, the women were prescribed absence from work and rest at home. They were seen at three-week intervals at the antenatal clinic until the beginning of the 29th week; they were then admitted to the maternity hospital. During the subsequent hospitalization treatment for prevention of preterm delivery consisted solely of rest. The mean duration of hospitalization was 55 days. They were discharged from hospital, provided that their pregnancy course had been normal after the end of the 36th week. Very few multiple pregnancies were allowed to exceed the 38th week, at which time induction was performed by amniotomy or IV Oxytocin administration. No twin pregnancies lasting less than 28 gestational weeks are included in this report. Triplets are also excluded.

To study the long-term effect on the health and development of twins exerted by preventive and therapeutic activities, 110 pairs of twins born between 1/1/73 and 1/5/77, were selected; 80% of the mothers in this group had been treated with bed rest. Of 214 twins surviving in this group, 204 (95%) were regularly examined at the Child Welfare Clinics up to at least 18 months postpartum. Similarly, 172 living twins born 1963/1965 (92%) were checked by paediatricians; they serve as a control group. Children with mental and neurological handicaps were repeatedly seen by specialists at a special centre for children with cerebral palsy and related disorders. As the postpartum observation periods are relatively short, the investigation focused on such major developmental handicaps as cerebral palsy, mental retardation (IQ < 50), hearing defects, and general late development. As a special index of the general condition of the twins at birth, the time for treatment postpartum at the nursery unit was evaluated.

Gestational age was estimated from the last menstrual period by Naegele's calculation and from the early clinical assessment of uterine size. Statistical methods were the chi-square test, exact permutation test, and Student's t-test.

RESULTS

During the study period, ultrasound was used to screen an increasingly large segment of the pregnant population. When the programme was in full effect, more than 95% of the women participated. Of the 136 twin pregnancies, 123 were detected in the programme – ie, a discrimination rate of 90%. Two of the examined twin pregnancies (1.7%) were mistakenly interpreted as singletons. No false-positive diagnosis was made. The average gestational age at the time of detection was 35 weeks during 1963/1965. The mean gestational

age for twin detection decreased from 30 weeks in 1973 to 17 weeks in 1978. Of the twin pregnancies in 1963/1965, 55% were discovered only after the birth of the first twin; in 1973/1978, 0.7%.

Table 1 lists the perinatal mortality (stillbirths + deaths within 28 days). The mortality is lower among twins in study group A than in groups B and C ($P < 0.01$). The difference appeared almost entirely in the neonatal period. In total, as many first twins as second twins died. Only three (19%) of the 16 neonatal deaths occurred after the 34 week.

The frequency of preterm delivery (before 37th gestational week) was reduced in the group with bed rest to 19%, compared with 45% in group B and 33% in group C ($P < 0.01$). In the group with bed rest, no deliveries occurred before the 33rd week (Table 2).

There was no difference in the average birth weight between the first and the second twin or between the three groups in the investigation. No twins were born with very low birth weight (< 1500 g) in the group with bed rest (Table 3). The percentage of twins born light-for-gestational age (-2 SD below mean Swedish standard values for singletons [13]) was lower in the group with bed rest (16%) than in groups B and C (25% and 24%, respectively). One-minute Apgar scores below 7 among twins were almost four times more frequent than among singletons. The second twin had a low 1-minute Apgar score 2.4 times more often than the first twin ($P < 0.05$).

TABLE 1. Perinatal Mortality (Stillborns + Deaths Within 28 Days)

Group	Antepartum		Postpartum		Total	
	n	%	n	%	n	%
Bed rest 1973/78	1	0.5	0	0.0	1	0.5
No bed rest 1973/78	2	3.2	3	4.8	5	8.0
All 1963/65	3	1.6	13	7.0	16	8.6

TABLE 2. Gestational Age at Delivery (Weeks)

Group	29-30	31-32	33-34	35-36	>37	Total number
	%	%	%	%	%	
Bed rest 1973/78	0	1	5	13	81	105
No bed rest 1973/78	0	10	16	19	55	31
All 1963/65	3	3	14	13	67	93

TABLE 3. Birth Weights (g)

Group	< 1500		1500-2500		> 2500	
	n	%	n	%	n	%
Bed rest 1973/78	0	0	93	44.3	117	55.7
No bed rest 1973/78	6	9.7	38	61.3	18	29.0
All 1963/65	9	4.8	81	43.5	96	51.6

TABLE 4. Incidence of CNS Disorders and Late Development

Group	Total number		Cerebral palsy		Mental retardation		Hearing defect		Late development	
	n	%	n	%	n	%	n	%	n	%
1973/1977	204		1	0.5	2	1.0	0	0	3	1.5
1963/1965	161		5	3.1	3	1.9	2	1.2	5	3.1

Table 4 lists the incidence of neurological sequelae and late development among the 204 controlled twins: 96% were healthy and normally developed for their age. Comparisons were made with 161 twins born ten years earlier (1963/1965). Neither in 1963/1965 nor in 1973/1977 could consistent differences between the first and the second twin be demonstrated concerning neurological handicaps.

Twins born 1973/1978 were treated at the neonatal ward more often but for much shorter periods than twins born 1963/1965. The average time of treatment of the twins whose mothers were treated with bed rest during pregnancy was nine days. The corresponding figures for twins whose mothers were not treated with bed rest in 1973/1978 was 21 days, and in 1963/1965, 18 days ($P < 0.001$).

DISCUSSION

The reduction in perinatal mortality was the most obvious feature noted in the study group. In the group treated with bed rest perinatal deaths were reduced to the same levels as for singletons today at our unit. For those twins born to mothers who were not treated with bed rest during 1973/1978, perinatal mortality remained as high as ten years before. An explanation for the drastic reduction in mortality in the group with bed rest might be that no twins were born between the 29th and the 33rd week. Neonatal mortality in the control groups occurred mainly for twins born during these weeks.

During 1973/1977 perinatal mortality of twins in Sweden was reduced to 5%. This is not a spontaneous improvement but a result of a generally improved detection rate by the use of ultrasound and measurements of the symphysis fundus height and improved antenatal care, including bed rest. The difference in the twin care in Malmö from the rest of Sweden is mainly quantitative. The lack of early and complete twin diagnosis reduces the effectiveness of the preventive treatment at those units that lack routine screening.

No difference in average birth weight between the bed rest group and the control group has been noted in recent years, thanks to the more active attitude in obstetric practice which terminates twin gestations before the 39th week. The total exclusion of twins with very low birth weight (< 1500 g) in the group with bed rest and the reduction of the number of SGA infants have been interpreted as quality improvements. Half of the twins with sequelae from the 1963/1965 groups were small-for-gestational age. In 1973/1977, only one in six twins with sequelae was small-for-gestational age. The neurological handicaps and sequelae for twins born 1963/1965 were not associated with preterm delivery but with low birth weight. The recent finding that impairment of the intrauterine supply line is primarily associated with neurological sequelae [4, 10] gives added importance to the reduction of CNS handicaps and of growth-retarded fetuses observed during the present programme. It is important to note that twin I suffers from handicaps as often as twin II. This implies that the difference in the obstetrical handling, determined by the fact that, in 1963/1965, three-fifths of twin diagnoses were not obtained until after the birth of twin I, was of minor significance for the genesis of sequelae, although the frequency of low Apgar score was highly elevated for the second twin. These findings suggest that obstetrical methods even in the 1960s were optimum for twin deliveries.

In conclusion, many factors contribute to the reduced perinatal mortality and morbidity in twin pregnancy. The postponement of delivery until after the 34th week seems important for the avoidance of severe immaturity, which is an important factor in perinatal mortality in twins. It also seems important to facilitate the intrauterine growth and to reduce the proportion of infants small-for-gestational age and vulnerable for brain damage, thus diminishing the neurological sequelae.

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