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Short Note

The First Five Years of the Budapest Twin Register, 1970–1974

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The Budapest Twin Register recorded 88.6% of the 1739 multiple births that occurred between 1970 and 1974. Of these, 31.2% were male-female pairs. Based on the examination of the placenta (19.8% monochorial) and of genetic markers, 406 pairs proved to be monozygotic and 645 dizygotic. Sex ratio of twins at birth showed a female preponderance (1000 F:1009 M) in comparison to singletons (1000 F:1071 M). Average birthweight of the twins was 2101 g. The frequency of stillbirths was about four times higher in twins than in singletons, twice as high in monozygotic than in dizygotic twins, and 2.4 times higher among second than first-born twins.

Key words: Twin registers, Twinning rates, Hungary, Zygosity determination, Sex ratio, Stillbirth rate, Seasonality

Beginning with 1 January 1970, all maternity wards in Budapest have to report multiple births to the Budapest Twin Register (BTR) set up at the National Institute of Hygiene. The HEIM PÁL Children's Hospital provides for the medical care of twins. The BTR was organized on the following principles: (1) All multiple births, including stillbirths are recorded. (2) All placentas are examined by one and the same pathologist. (3) Twin zygosity is assessed in all dichorial like-sex twins by determining blood and serum protein groups.

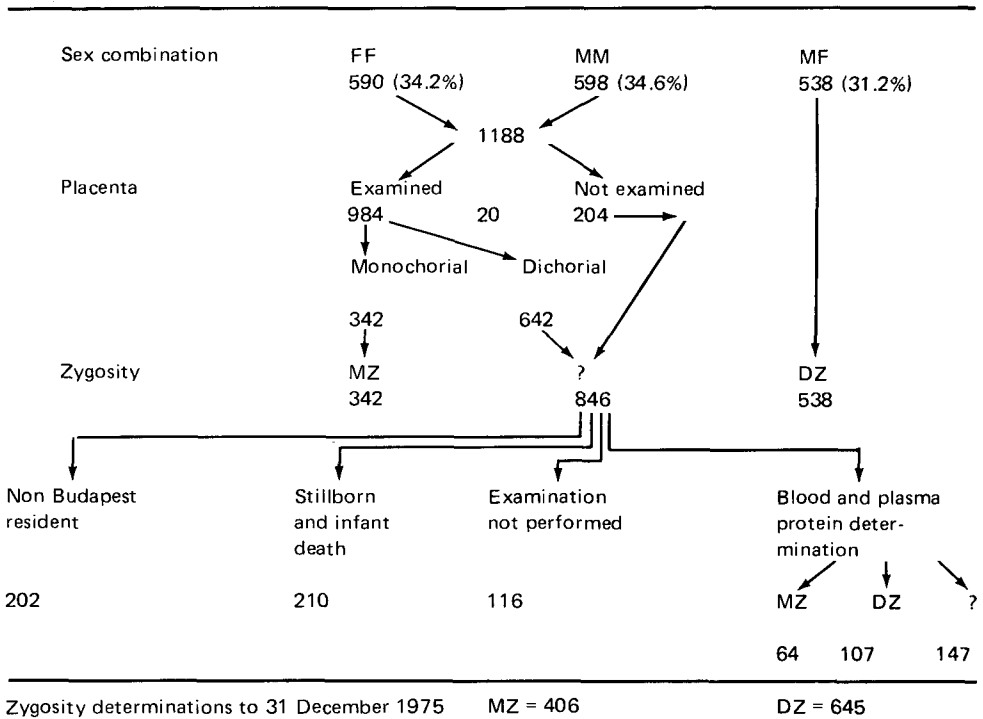
The data of the BTR show that 88.6% of all multiple births were notified (Table 1). The procedure for the determination of zygosity is summarized in Table 2. (The sex of one member each in two pairs and of both members in one pair of stillborn infants was unknown; thus they were disregarded.)

The rate of female-female (FF) and male-male (MM) pairs was identical, and that of male-female (MF) pairs somewhat lower (the deviation, however, is not significant: $\chi^2_2 = 3.69$; $0.10 > P > 0.05$).

TABLE 1. Data of the Budapest Twin Register on Multiple Births, 1970–1974

Year	Number of births			Notifications	
	Twins	Triplets	Total	No.	%
1970	353	2	355	306	86.2
1971	311	2	313	266	85.0
1972	320	2	322	276	85.7
1973	342	2	344	324	94.2
1974	403	2	405	368	90.0
Total	1,729	10	1,739	1,540	88.6

TABLE 2. Procedure of Zygosity Determination – Budapest Twin Register, 1970–1974 (n = 1726 twin pairs)



Placenta examination, because of a lag in notification and technical difficulties, would be performed in only 984 of the 1188 like-sex twin pairs (82.8%). In 342 cases (34.7%) the placentas were monozygotic proving monozygosity.

Based on unlike sex (31.2%) and the monozygotic placentas (19.8%), twin zygosity could be ascertained in 51% of the material at birth. In the course of medical care for twins, the remaining 49% were intended to be examined for blood and serum protein groups at the age of 6, 12 and 24 months, respectively. The same examinations were planned to be made on the parents. Dermatoglyphics of the fingers and palms of the

twins also formed a part of the study.

ABO and Rh blood group determination and dermatoglyphic analysis were performed in 578 twins. MNSs, Duffy, Kell, P, Kidd, and C^W blood groups were determined in 81, 64, 42, 29, 29, and 38 cases, respectively. Haptoglobin types were examined in 155 twin pairs and in 20 cases in one member of the pair. Any difference between cotwins was considered to prove dizygosity. When genetic markers were identical, however, the probability of monozygosity was estimated: when this exceeded the 95% confidence limit, monozygosity was accepted. In a considerable number of the twins, zygoty was not, or not yet, determined for the following reasons: (1) Parents no Budapest residents. (2) Stillbirth of one or both members of a like-sex dichorial pair. (3) Subsequent infant death of one or both twin members. (4) Reluctance of the parents to allow blood withdrawal. (5) Study of genetic markers insufficient to reach the 95% confidence limit.

Of the ten sets of triplets, three were of different sex, one was monochorial, and in the remaining six zygoty was not yet identified.

Sex ratio of twins showed a characteristic shift to female. There were only 1,009 males for 1,000 females, in contrast to the 1000:1071 female-male ratio of singletons in the same period. This may be ascribed to the higher early prenatal selection of males. In the male-female pairs, the male was significantly more often the first-born, perhaps due to higher birthweight.

Liveborn twins had an average birthweight of 1201 g, with 71% below 2500 and 7.9% below 1000 g, thus constituting a considerable part of all low birthweight and preterm infants (12–15%). Average birthweight of boys was higher (2124 g) than that of girls (2078 g). The birthweight difference within the pairs of liveborn MZ and DZ twins showed no notable difference (220–240 g).

In terms of monthly distribution (Figure), twinning appeared to practically correspond to the usual monthly fluctuation of births but its seasonality was more pronounced.

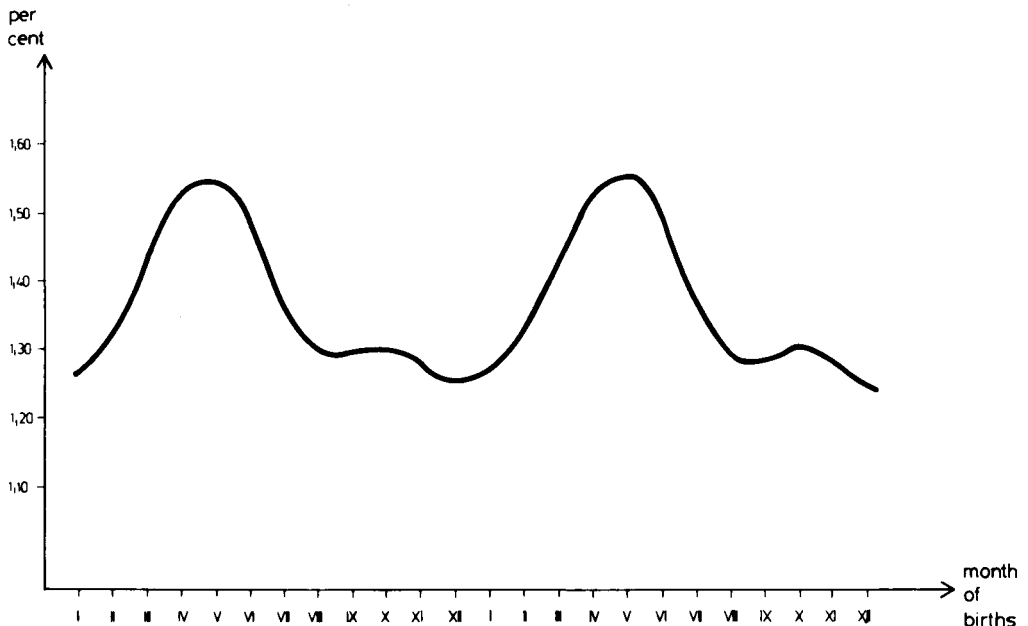


Figure. Monthly distribution of twin births: Budapest, 1970–1974. Figures expressed as percentage of all births for the given months.

Of the 3488 infants born from 1739 multiple births, 104 were stillborn (2.98%). This corresponds to almost four times the stillbirths figure of singletons for the same period in Budapest (0.81%). (There being no stillbirths among triplets the actual frequency of stillbirth in twins was 3.01%). Both cotwins were stillborn in 0.58% of cases, one only in 4.64%.

Increased intrauterine risk of MZ vs DZ twins is shown by the fact that both cotwins were liveborn in 91.9% of the former vs. 96.0% of the latter. Stillbirths occurred in 4.8% of MZ vs 2.1% of DZ twins.

The preponderance of stillbirths among singleton males is well known (0.86% vs 0.76% in females). In contrast, the stillbirth rate among multiple births was lower in males (2.74% vs 3.17% in females).

The stillbirth rate was also much higher among second-born twins (4.22%) than among first-born ones (1.79%). Thus, the stillbirth rate of second-born twins is 2.4 times higher than in first-born twins and 5.2 times higher than in singletons. The average birthweight of stillborn twins (1564 g) was significantly lower ($P < 0.001$) than that of the live born ones.

The primary aim of the BTR is the special protection of twins in the prenatal and perinatal period. As a byproduct it supplies a unique material for scientific research.

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