THE TWIN REGISTER OF BUDAPEST

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Since 1 January 1970, multiple births have been recorded by the Budapest Twin Register. The maternity wards report multiple births by telephone, retain the placenta, mark the umbilical cord of the first born and fill in the Registration Form of Multiple Births indicating the most important personal and obstetrical data. Placentae are examined by a pathologist. In like-sexed twins with dichorial placenta zygosity is determined 6-24 months after birth by applying blood and serum protein group determinations and dermatoglyphics. A total of 85.9 and 84.2% of all multiple births (356 and 316) were reported in 1970 and 1971, respectively. So far, the zygosity of twins was determined in 53.8 and 50.5% of all twins in 1970 and 1971.

The purposes of a twin register are well-known. First of all, it may give an essential help to the health care of twins. Realising the significantly higher mortality of multiple births, we consider this to be an important task. Secondly, the twins are a very useful scientific material that can provide some valuable information on the relative contribution of genetic and environmental components in the etiology of congenital anomalies and of some diseases.

The twin studies have had a long past, but this has not been free from problems. Two of the greatest pitfalls were the natural and artificial selection of twin material and the uncertainty of zygosity. While organising our Budapest Twin Register we tried to avoid these biases. As a matter of fact, Professor Mogens Hauge from Denmark was our inspirer.

Since 1 January 1970, a compulsory and continuous reporting of multiple births to the Twin Register was ordered by the Health Department of the City Council, Budapest. (Out of Hungary's 10 million inhabitants, 2 millions live in the capital.) In Budapest 99% of the deliveries take place in the 29 maternity wards. These institutions report multiple births by telephone, after the physicians mark the umbilical cord of the first born, retain the placenta and fil in the green Registration Form of Multiple Births (Table 1). This form contains only some important personal and obstetrical data. Placentae with Registration Forms enclosed are collected by the workers of the Twin Register within one day or two following delivery. The placentae are examined by a single pathologist, Dr. Goracz. Finally, all the data of twins and triplets are summarised on Twin Recording Cards (Table 2).

Once a month the Central Statistical Office puts the list of Budapest multiple births at our disposal, which serves as a control of the reporting. The rate of reporting is shown on Table 3. In the future we would like to work with 80-90% of reliability.

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Table 1. *Registration Form of Multiple Births*

A-twin: name .....
Live-, stillbirth, ab. spont.* Birth weight .....
B-twin: name .....
Live-, stillbirth, ab. spont.* Birth weight .....
Date of birth: year 197..... month ..... day .....
Blood losses during delivery *: little, usual, much, very much
Address of father (mother) .....
Report on zygosity *: requested, not requested
Name and address (stamp) of institute .....
.....
Date: .....

.....
(Legible) Signature

On the reverse of the form the task is summarised.
In case of asterisks the physicians have only to underline or to mark appropriate words with a circle.

Table 2. *Twin-Recording Card*

DZ; Odds of DZ ..... MZ

A-twin: name .....
Boy, girl; ab. spont., stillbirth, livebirth, infant mort., later on †
Date of birth: 197..... Birth weight .....Cong. malf .....
Address of reporting institute .....
Placenta: Di-sep, Di-fus, MoMo, MoDi
A_1 A_2 B O A_1B A_2B; C c D d E e: MM MN NN
SS Ss ss; Fy^a Fy^{ab} Fy^b; Hp 1-1 Hp 1-2 Hp 2-2; Gm^a Gm^b
TRC ..... Atd .....
Father/Mother (blood and serum-protein groups).....
.....
TRC ..... Atd .....
Address.....
Call up: 6 months 12 months 24 months
Note .....

B-twin: name .....
same

Table 3. *Multiple Births in Budapest, 1970-1971, and Rate of Reporting*

Year	Twins	Triplets	Multiple births	Reported cases	
				N	%
1970	354	2	356	306	85.9
1971	314	2	316	266	84.2

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Table 4. *Zygosity of Twins in Budapest, 1970-1971*

	1970				1971			
No. of twins		354				314		
Sex	FF	MM	FM		FF	MM	FM	
N	116	117	121		104	106	104	
%	32.7	33.1	34.2		33.1	33.8	33.1	
Placenta examination	96	92	87		87	80	69	
Type	Mo	Di	Di		Mo	Di	Di	
N	66	122	87		56	111	69	
%	24.0	44.4	31.6		23.7	47.1	29.2	
Zygosity	MZ	?	DZ	Loss	MZ	?	DZ	Loss
N	66	122	121	45	56	111	104	46
Total % (without loss)	21.3	39.5	39.2	—	20.7	40.9	38.4	—
(with loss)	18.6	34.5	34.2	12.7	17.7	35.0	32.8	14.5

The distribution of registered twin pairs is shown in Table 4. The situation is simple in case of unlike-sexed twins (about one-third of all) because they are DZ. In case of like-sexed twins, with the placenta examination we can separate the monochorial MZ twins (about 20% of all.) Thus, we were able to determine the zygosity in about 50% of our material at birth. But thereafter, in case of dichorial like-sexed twins, we are facing some difficulties, namely: babies born in Budapest from parents residing in the country, the higher mortality of twins, the technical problem arising from taking too large a quantity

Table 5. *Fate and Zygosity of Like-Sexed Dichorial Twins in Budapest, 1970-1971*

	1970		1971	
	N	%	N	%
No. of like-sexed dichorial twins	122	100.0	111	100.0
Parents residing in Budapest	74	60.7	77	69.4
Both babies alive at 6 months	57	46.7	53	47.7
Diagnosis of dizygosity (till 31.7.1972)	? DZ		? DZ	
	54 3		46 7	

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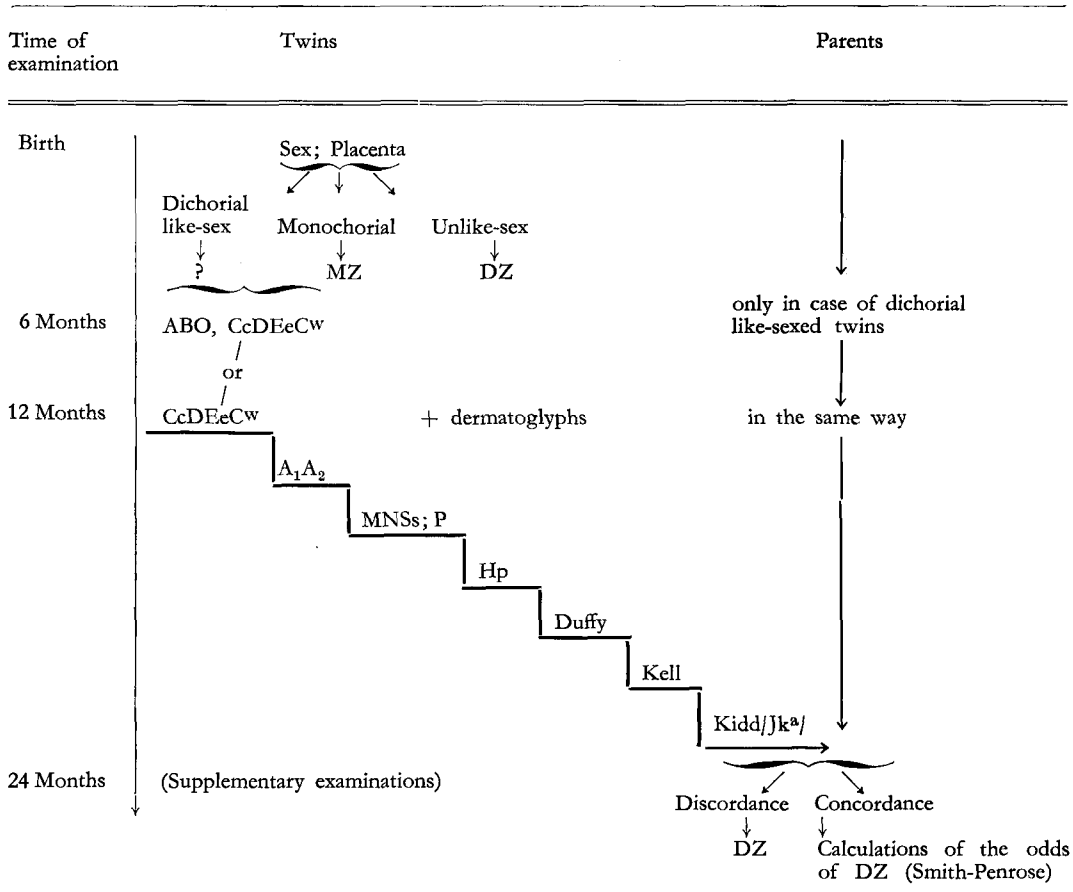
Table 6. *Diagnosis of Zygosity in Cases of Dichorial Like-Sexed Twins*



of blood from healthy infants for the test, and, last but not least, the high prices of serotypes of blood and serum-protein groups (Table 5). On account of these technical problems, our material has suffered relatively great losses and a considerable backlog in the diagnosis of zygosity. Some blood and serum-protein groups are determined in a defined order (Table 6) at the age of 6 months or, more frequently, at 12 months (at that time they are supplemented by dermatoglyphics) in both twins and parents. All discordances prove dizygosity. In case of total identity in twins we calculate — on the basis of parental genotypes, or, if they are unknowm, according to the method of Maynard-Smith and Penrose — the relative chances in favour of DZ pairs.

We hope after the initial difficulties, the Twin Register of Budapest will come up to our expectations supplying useful material for research and international cooperation.

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