

Failure to Obtain Reliable Retrospective Determination of Chorion Type Using Parent Information: Confirmation with French Data

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Following the Derom et al. paper recently published in *Twin Research* (2003, 6, 19–21), we investigated our French sample, studying the retrospective validity of information given by parents to determine the chorion type of their monozygotic twins. The sample included 44 MZ pairs of known chorion type. Chorion type was established by a pathologist specialising in the study of placenta and zygosity diagnosis using molecular genetic techniques. Results show that of the parents who had information, there was a high level of uncertainty of the chorion type. It therefore seems impossible to obtain valid retrospective determination from parents and the only solution is to have accurate information in the birth records.

In a recent paper Derom et al. (2003) showed that retrospective determination of the chorion type with a simple questionnaire filled out by parents was unreliable. Information given by mothers on the number of placentas at birth was compared with information recorded by medical staff at the birth of the twin pairs. The sample was large considering the paucity of this type of data: 231 mothers of 95 monochorionic monozygotic twin pairs (MC MZ) and 136 dichorionic monozygotic twin pairs (DC MZ). All MC twins are MZ, but the risk of a false zygosity determination for DC twins is high as all DZ twins are DC and approximately 35% of MZ twins are DC.

Data in the present study were obtained on our populations of MZ twins with known placentation and compared to information provided by the parents on the type of placenta (father and mother).

Materials and Methods

Taking all the birth records (335) of three Paris hospitals from 1982 to 1985, those with two alive, same-sex twins were reviewed (198). Ninety-six families still living in France were traced. Eight families

refused the psychological assessment of their twins. On the remaining sample, all presumably MZ pairs (according to a similarity questionnaire) were assessed using a wide range of psychological measurements (Carlier et al., 1996; Gutknecht et al., 1999; Spitz et al., 1996a). Presumably DZ pairs were not tested if they were living outside the Parisian area (including the suburbs) to reduce costs. Zygosity was ascertained using three methods, including molecular genetic techniques based on highly informative SSLP (Simple Sequence Repeat Length Polymorphisms; Spitz et al., 1996b). The chorion type was determined by Marie-Christine Vacher-Lavenu, a pathologist specialising in the study of placenta (M.-C. Vacher Lavenu, see Spitz et al., 1996) and who had no prior knowledge of any zygosity diagnosis. Methods included analysis of ultrasound examinations (although no definite diagnosis was based on ultrasound examination), analysis of the macroscopic description of the placenta by the obstetrician (and/or midwife) at the time of delivery, and the pathologist's examination of the placenta kept in her records (macroscopic and microscopic as required). The final MZ sample studied was comprised of 55 MZ pairs: 20 MC-MZ, 24 DC-MZ, and 11 pairs with unknown placentation.

In the first stage of the research program, parents filled out a questionnaire sent by mail. One of the questions targeted information indicating the presence of one or two chorions: "What explanations were you given about your twins being identical or fraternal?" Another question was: "Do you consider your twins to be identical or fraternal?" The answers to these questions showed the number of parents who had mistaken the zygosity of their twins.

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Results

The pathologist’s assessment of the chorion type was set against the parents’ assessment made on the basis of the placenta and their opinion on the zygosity of their twins (see Table 1).

Twenty-three out of 55 families misclassified their MZ twins, believing them to be DZ. In 15 out of these 23 cases (65.2%), the twins were DC (see Table 1). Only two of the misclassified twins were MC (8.7%). For the last 6 cases (26.1%) the chorion type was unknown. Where they DC? Probably most of them (in this small sample of misclassified MZ twins with known chorion type the odds of having a DC MZ were 7.5:1) but which ones? Interestingly, none of the parents of DZ twins in the sample had misclassified them (24 pairs — data not shown).

In 15 out of 20 cases in the MC group, parents had information on the type of placenta and had the correct chorion type in 11 of these cases (73%). Parents reported information on the placenta in only 11 cases out of 15 in the DC group. In 9 of these 11 cases (81.8%) the information was consistent with the chorion type, although the term “sac” was interpreted as meaning “chorionic sac” and not “amniotic sac”.

Discussion

Only 26 families (47.3%) were able to give information on the placentation of their twins and of these, 20 (76.9%) gave accurate information with the right chorion type, provided the term “sac” (“poche” in French) is accepted as synonymous with chorionic sac. And for this sub-group, it was probably true, as in almost all cases with two sacs, the MZ twins were considered DZ by their parents. It is highly probable that the parents’ opinion on the zygosity of their

twins was based on information provided by the medical staff: the obstetricians would have told the parents the twins were DZ on the basis of the placentation, overlooking the fact that some 30% of MZ twins are dichorionic. What would the conclusion have been with a different obstetric team? It is impossible to speculate. In the present study the risk of misclassification of the 11 pairs assessed by the pathologist as “unknown placentation” was considered too high and the pairs were discarded for the statistical analyses (Spitz et al., 1996a). Unfortunately, neither the “mirror handedness” in MZ twins (Carlier, 1996; Carlier et al., 1996; Derom et al., 1996) nor the dermatoglyphic index (Reed et al., 1997) can be used for retrospective assessment of the chorion type. The only solution therefore is to have reliable information in the birth records.

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Table 1

Parental Information/Opinion on Placenta and Zygosity and Pathologist’s Assessment of Chorion Type (55 MZ Pairs)

Chorion type	Parents’ opinion of zygosity of their twins	Information on placenta given by parents			Total			
		1 placenta	1 sac	Twin transfusion syndrome	2 placentas	2 sacs	?	
MC	MZ	3	6	2	1		5	17
	DZ				1	1		2
	?				1			1
DC	MZ	2			1		3	6
	DZ				4	4	7	15
	?						3	3
Unknown	MZ	3						3
	DZ				1	4	1	6
	?				1		1	2

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