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Recurrent Spontaneous Twinning

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Abstract. 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 ($P < 0.04$) and mean twin birth weight ($P < 0.05$) compared to the first twin pregnancy. When compared to controls matched for maternal age and gestational age they were of significantly higher parity ($P < 0.005$) 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 ($P < 10^{-6}$) suggesting that both deliveries may be stochastically dependent events.

Key words: Twins, Parity, Maternal age

INTRODUCTION

Recurrent spontaneous twin pregnancy is a rare obstetric event that consequently had not received much attention in the literature. For students of the natural history of the twinning process, this unique reproductive occurrence may be of considerable interest as it may clarify the influences of maternal age and parity in the same individual on the outcome of a subsequent twin gestation. Moreover, it may suggest the predisposing factors for spontaneous twin gestations. Obviously, for the sake of reliability, a considerably large data base is necessary to obviate type II statistical errors. Having constructed such a data base at the Kaplan Hospital,

we report, to the best of our knowledge, the first study on outcome of recurrent spontaneous twinning.

PATIENTS AND METHODS

The Kaplan Hospital twin gestation data base comprised 456 twins delivered after 28 wk gestation during the period 1980-1988 (1.08% of 42,267 deliveries). Excluded were 73 twin pregnancies following ovulation induction. Screening the data base for a recurrent twin delivery, we found 7 patients (1.8% of the 383 spontaneous twin pregnancies reaching 28 wk) which comprise the study group. The obstetric and neonatal data were abstracted from the respective files. The repeat twin pregnancy was compared to the preceding twin pregnancy and to three control groups, each matched for either maternal age, parity, or gestational age, respectively. Two control twin pregnancies achieved without assisted ovulation were chosen for each repeat twin pregnancy by computer randomization using the original twin data base.

The following variables were studied after matching: maternal age (excluding the group matched for maternal age), parity (counting twins as one delivery, excluding the group matched for parity), gestational age (estimated by menstrual history, first trimester ultrasonography and first positive hCG serology; excluding the group matched for gestational age), mean twin birth weight ($(\text{twin A} + \text{twin B})/2$), degree of discordance (intertwin birth weight difference expressed as percentage, using the larger twin as 100%), presentation combinations, rate of cesarean section, rate of monochorial like-sex twins, maternal and neonatal morbidity and perinatal mortality.

The data were preprocessed by the EPISTAT statistic package. Categorical data were evaluated by the Fisher's exact test due to the small sample size. Student's t-test and Wilcoxon rank sum test were applied to examine continuous variables. $P < 0.05$ was considered statistically significant.

RESULTS

The Table shows the comparison between the perinatal characteristics of the repeat twin pregnancy and the four respective controls. Patients delivered of a recurrent twin gestation were significantly older and of higher parity compared to their first one, suggesting an obvious, but significantly different age and parity group (ie, the twin pregnancies were generally not consecutive). However, when compared with controls matched for parity, they were not older, but when compared to controls matched for age, they were of significantly higher parity, suggesting that parity, but not maternal age, specifically characterizes repeat twinning. This was also suggested from the comparison to patients delivering at the same gestational age which were of a similar maternal age but of significantly lower parity.

Table - Perinatal characteristics of repeat compared to previous twinning and matched controls

	2nd delivery	1st delivery	Matched controls for		
			Maternal age	Parity	Gestat. age
Maternal age (yr)	31.1 ± 5.1 ^a	26.3 ± 6 ^a		33.6 ± 3.3	28.6 ± 5.5
Parity	4.8 ± 2.4 ^{a, b}	3 ± 2.5 ^b	2.3 ± 1.1 ^a		2.4 ± 1.9 ^c
Gestational age (wk)	37.8 ± 2.4 ^c	34.1 ± 3.9 ^c	37.8 ± 1.8	35.7 ± 2.8	
Mean twin birth weight (g)	2270 ± 537 ^d	1869 ± 652 ^d	2759 ± 459	2374 ± 761	2502 ± 489
Discordance (%)	23.9 ± 20.6	21.6 ± 21.9	15.8 ± 15.5	10 ± 8.2	14.8 ± 17.5
Presentation					
V-V	3 (42.8%)	4 (57.1%)	4 (28.6%)	4 (28.6%)	6 (42.9%)
V-NV	2 (28.6%)	3 (42.9%)	5 (35.7%)	7 (50.0%)	3 (21.4%)
NV-V	2 (28.6%)		3 (21.4%)	1 (7.1%)	2 (14.3%)
NV-NV			2 (14.3%)	2 (14.3%)	3 (21.4%)
C-section	1 (14.3%)		4 (28.6%)	3 (21.4%)	2 (14.3%)
Monochorial			1 (7.1%)	1 (7.1%)	1 (7.1%)
Perinatal death	1 (AP)	1 (PP)			

^a = $P < 0.005$; ^b = $P < 0.002$; ^c = $P < 0.04$; ^d = $P < 0.05$;

V = vertex; NV = non-vertex; AP = antepartum; PP = postpartum.

The gestational age and consequently the mean twin birth weight of the repeat twin delivery were significantly higher compared to the first twin delivery. The similarity of these variables to those of the three matched groups suggest that heavier twins of an older gestational age characterize recurrent twinning. In contrast, intertwin birth weight discordance was not associated with a repeat twin gestation. The cesarean delivery rate was higher in the controls due to higher number of twins in malpresentation, but the differences were not significant. There were no monochorial like-sex pairs among both deliveries of the index mothers. The maternal and neonatal morbidity were similar in all groups. The mortality cases were second twins delivered of the same mother: the first was a 780 g, 66,1% discordant, who died 6 days postpartum, and the second was a 750 g, 70% discordant, who died 5 days before delivery. This mother had two other stillbirths between the twin deliveries.

DISCUSSION

There is general agreement that the chance of twinning is more frequent among mothers of twins compared to mothers of singletons. Nora and Fraser [2] suggested

a 3% probability – about a four-fold increase – of recurrent DZ twins in subsequent deliveries of mothers who have had a pair. Parisi et al [5], in their large study on the incidence of twinning in the families of 950 zygosity-determined, unselected twin pairs, also found the repeat frequency of twinning to be considerably higher than the population frequency of twinning. The same authors indicated maternal inheritance, as well as a paternal role, in the propensity to twinning. Rao [6] controlled a sample of 10,916 third-trimester deliveries for maternal age and parity and observed a significant effect of these parameters on twinning as also shown by Bulmer [1] and Wyshak and White [8]. In a specific study of 18,737 maternities among the Yorubas in Western Nigeria, Nylander [3] found that women who have had twins previously in all age and parity groups, have a twinning rate about twice that of their counterparts who have not. Using a much smaller group, Nylander [4] also found that the levels of follicle stimulating hormone (FSH) at the peak were highest in mothers of two sets of twins and suggested that higher mean FSH levels are associated with twinning tendency. In contrast to these views, Record et al [7] studied the fertility of 1,648 mothers of twins and pointed out the difficulties in measuring their fertility, suggesting a self-induced but not a biological origin of reduced fertility of mothers after a successful twin birth.

Our data suggest a two-fold frequency of spontaneous repeat twinning ($7/383 = 0.018$) compared to spontaneous twinning in general ($383/42,267 = 0.009$). Assuming that each twin pregnancy has the same probability (chance event), the square of the probability of spontaneous twin gestation ($[0.009]^2 = 81 \times 10^{-6}$) was significantly lower ($P < 10^{-6}$, proportion test) compared to the probability of the spontaneous repeat twinning ($7/42,267 = 165 \times 10^{-6}$), suggesting that the first and second twin deliveries may be stochastically dependent. It is possible, however, that the increased incidence of recurrent twinning may also be an age- and parity-related process and not of genetic (increased tendency in mothers of twins) determination [3,5]. Our data did not include missed twin pregnancies of earlier than 28 wk gestation, as these are difficult to assess retrospectively.

The data further show that a successive twin delivery has a better outcome when compared with the first twin delivery, assessed by the mean twin birth weight and mean gestational age. These may be due to increased maternal age and parity as time passed between the two twin pregnancies. In turn, the similarity between the obstetric performance of the repeat twin deliveries and the matched controls suggests that the first twin delivery is at disadvantage. A possible explanation may suggest increased maternal awareness of complications and better antenatal care of patients having recurrent twin pregnancies.

It is concluded that repeat twinning is not associated with adverse perinatal outcome. It remains, however, to evaluate early twin gestations as our data did not include early fetal loss of one or both twins.

REFERENCES

1. Bulmer MG (1959): The effect of paternal age, parity and duration of marriage on the twinning rate. *Ann Hum Genet* 23:454-458.
2. Nora JJ, Fraser FC (1981): *Medical Genetics - Principles and Practice*, 2nd Ed. Philadelphia: Lea and Febiger, p 349.
3. Nylander PPS (1970): The inheritance of DZ twinning. *Acta Genet Med Gemellol* 19:36-39.
4. Nylander PPS (1973): Serum levels of gonadotrophins in relation to multiple pregnancy in Nigeria. *Br J Obstet Gynaecol* 80:651-653.
5. Parisi P, Gatti M, Prinzi G, Caperna G (1983): Familial incidence of twinning. *Nature* 304:626-627.
6. Rao TV (1978): Maternal age, parity, and twin pregnancies. In Nance WE, Allen G, Parisi P (eds): *Twin Research: Biology and Epidemiology*. New York: Alan R, Liss, pp 99-103.
7. Record RG, Armstrong E, Lancashire RJ (1978): A study of the fertility of mothers of twins. *J Epidemiol Community Health* 32: 183-189.
8. Wyshak G, White C (1960): Fertility of twins and parents of twins. *Hum Biol* 41:66-82.

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