

# Maternal Age and Birth Order of Young IDDM Patients

## A study from southern India

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**OBJECTIVE**— To assess the effects of maternal age and birth order on the risk of IDDM in Asian Indians.

**RESEARCH DESIGN AND METHODS**— Data from a diabetes registry in Madras, India, was used to find IDDM patients diagnosed before 20 yr of age. A questionnaire was used to elicit clinical details of subjects.

**RESULTS**— Children with mothers  $\leq 24$  yr of age had a higher percentage of IDDM. Children with lower birth orders had a higher prevalence of IDDM.

**CONCLUSIONS**— The risk of IDDM in children is increased in children with lower birth orders, born of younger mothers.

Increasing maternal age is associated with higher risk of IDDM in offspring in European populations (1,2). Herein, we report an analysis of the effects of maternal age and birth order on the risk of IDDM in Asian Indians from a large data base in southern India.

### RESEARCH DESIGN AND METHODS

Data on all subjects with IDDM attending the Diabetes Research Centre and M.V. Hospital for Diabetes, Madras, India, are recorded in a computerized registry, the details of which were

described previously (3). All subjects had acute onset of symptoms, were prone to ketosis, and were absolutely dependent on insulin from the time of diagnosis. This particular analysis was done only in IDDM subjects  $\leq 20$  yr of age at diagnosis. A total of 940 IDDM patients was registered through December 1991, and 520 subjects were  $\leq 20$  yr of age when diagnosed with diabetes. A questionnaire was used to elicit all details of the family history of diabetes, the present age of each family member, maternal age at the time of birth of the proband, family size,

and birth order. The accuracy of these data was confirmed by questioning at least one more member of the family whenever possible. Of the 520, complete data were available for 313 diabetic children, and the details are presented herein. In nine families, there were 2 diabetic subjects. Therefore, 313 patients belonged to 304 families.

**RESULTS**— Table 1 shows the occurrence of diabetes in children of mothers of different age-groups (at the time of birth of the diabetic child) and also according to the birth order of the children.

The percentage of diabetes in children born of mothers  $\leq 24$  yr of age was higher compared with the children in other groups ( $P < 0.01$ ). Children of birth orders 1 and 2 had a significantly higher prevalence of IDDM ( $P < 0.001$ ) than those of higher birth order. The mean current age of the children was  $\geq 17$  yr in all groups, thereby showing that all of them had gone through the vulnerable age for development of IDDM.

The maternal age increased with increasing birth order of the probands as expected. The mean age at diagnosis of diabetes increased slightly with the birth order, but the differences were not significant in relation to the mean age of the total group ( $11 \pm 5.2$  yr; ANOVA).

**CONCLUSIONS**— The results show that the risk of IDDM in children was higher in those with lower birth orders who were born of younger mothers. These factors may be interrelated. These findings are in contrast to those reported in the white populations in which the risk of IDDM increased with increasing maternal age (2), and birth order was not significant. The decrease in the occurrence of IDDM with increasing birth order in this study was not a reflection of increasing maternal age, unlike in the report of Wagener et al. (2). In our population, the birth-order effect was more

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IDDM, INSULIN-DEPENDENT DIABETES MELLITUS; ANOVA, ANALYSIS OF VARIANCE.

**Table 1—Percentage of diabetic children in relation to maternal age (at time of birth of diabetic child) and their birth order**

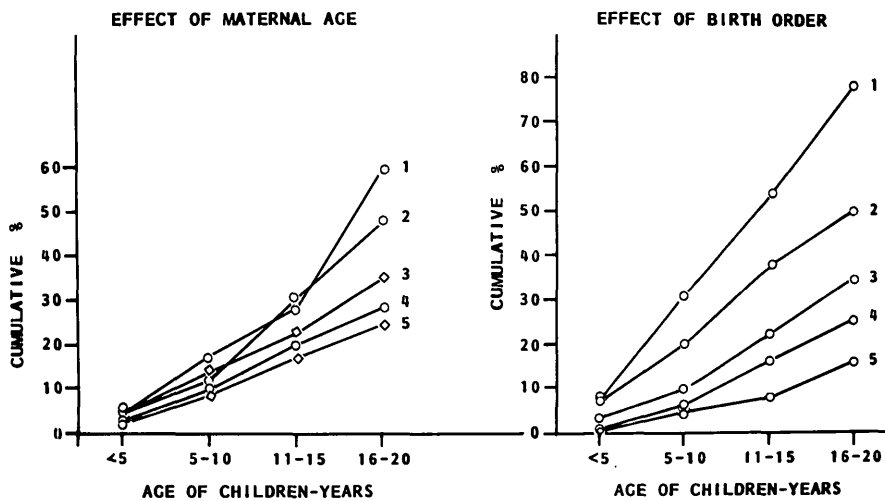
	CHILDREN (N)	DIABETIC CHILDREN (%)	CURRENT AGE (YR)	AGE AT DIAGNOSIS (YR)
<b>MATERNAL AGE (YR)</b>				
<20	190	32.1	19 ± 7	11 ± 5
20–24	329	32.5	19 ± 8	12 ± 5
25–30	345	28.4	18 ± 8	11 ± 5
31–34	149	22.0	20 ± 8	12 ± 5
>34	63	22.0	20 ± 8	11 ± 6
<b>BIRTH ORDER</b>				
1	245	40.4	17 ± 7	11 ± 5
2	252	36.9	17 ± 8	10 ± 5
3	211	27.9	19 ± 7	12 ± 5
4	112	22.3	22 ± 6	13 ± 4
5	99	16.2	23 ± 8	14 ± 4
>5	157	13.3	25 ± 8	15 ± 4

Current age and age at diagnosis are means ± SD. Cumulative percentage of diabetes was calculated and the comparison between groups was done with Mantel-Haenszel test (Fig. 1).

pronounced ( $P < 0.001$ ) than that of the maternal age.

**References**

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**Figure 1—A:** Cumulative frequency of IDDM in children according to maternal age. The X-axis shows the age of the children. Maternal ages are in yr: 1 = <20, 2 = 20–24, 3 = 25–30, 4 = 31–34, and 5 = >34. Difference between 1 and 2 is nonsignificant. Others differ from curve 1 significantly ( $P < 0.01$ ). **B:** Cumulative frequency of IDDM according to birth order of the child. Birth orders 1–4 are denoted by respective numbers and 5 denotes birth order  $\geq 5$ . Curves 1 and 2 are not different statistically, whereas other curves differ significantly from 1 ( $P < 0.001$ ).

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