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## THE TWINNING PHENOMENON

Etiologic, Genetic, and Demographic Aspects

# OOCYTE OVERRIPENESS RELATION TO MULTIPLE PREGNANCY

## An Epidemiologic Study \*

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*A total of 116 cases of multiple pregnancy has been observed in a 5-year period. MZ twin pregnancies appear to be significantly increased in the maternal age group 31-35. Also significant is the higher frequency of abnormal cycles in MZ twin pregnancies. Family incidence of twins is more significant in mothers of DZ as compared to MZ twins.*

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This study has been an attempt to find arguments for the hypothesis that an ovulation abnormality should be the origin of the MZ twin pregnancy.

The egg giving development to MZ twins is an abnormal egg, where the first division gives two individuals, and this should be compared to other egg abnormalities, i.e., chromosome aberrations in aborted egg, or cytoplasmic abnormalities as reported in malformed children.

This hypothesis of overripeness is the most interesting for the discussion of the mechanism of MZ twinning. The experimental studies on the adverse effects of overripeness always give as first abnormality a tendency to produce axial duplication and twins (Witchi 1952, Blandau 1954). The same adverse effect of overripeness also gives trisomies and monosomies by nondisjunction, haploidism and polyploidism mosaics, and embryos without chromosomal aberration but with teratogenic abnormalities.

As we were interested in the research of clinical circumstances favorizing the egg overripeness, we had to find clinical signs or measures giving the best approach to this very difficult problem. Age and parity are easy to measure. But it is difficult to have a clinical approach to egg overripeness. The best sign should be the day of ovulation, as we know the frequency of egg anomalies if this day is late (Hertig et al. 1956). If we do not know the day of ovulation, we can measure the length of cycle, abnormal cycles being often related to late ovulations. Or to know if the circumstances of intercourse were not the most favorable as did Jogbloët (1968) studying the etiological circumstances of congenital dysplasias (Goldenhar's syndrome).

A total of 116 cases observed in a 5-year period by the same team of researchers, in the

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same institution, are reported. We have considered as DZ only bichorial children of different sex and as MZ monochorial children of identical sex. The other cases were left in a third group of uncertain zygosity.

## RESULTS

1. *Effect of Maternal Age.* Incidence of DZ twins in relation to maternal age is very close to the normal distribution of pregnancy ages for the general population during the same period with a very slight peak between 31 and 35 years, which is not significant. On the other hand, the curve of maternal age in MZ pregnancies showed two peaks, one in the very young mothers, not significant, and the other in older mothers, aged 31-35 years, which is significant at the 0.05 level. This abnormality of distribution is comparable to the effect of maternal age in the epidemiology of Down's syndrome, but not so well marked.

Maternal age (years)	Up to 20	21-30	Over 30	Total
MZ twins (%)	11	45	34	100
DZ twins (%)	5	67	28	100

$P < 0.05$

2. *Effect of Menstrual Cycle Anomaly.* The study of menstrual cycles has demonstrated that in the case of DZ twins the incidence of normal regular cycles (25%) is similar to the one of the general population. But in the case of MZ twins the incidence of abnormal cycles (lengthened or irregular) is significantly more frequent (53%;  $P < 0.01$ ). A correlation between the incidence of this anomaly and the incidence of spontaneous abortion, karyotype anomaly (i.e., Down's syndrome) is obvious and of interest.

3. *Ovulation-Fertilization Delay.* No case of ovulation-fertilization delay was observed in our investigations.

4. *Family Incidence of Twins.* The study of family history shows a significantly greater family incidence of twins in the mothers of DZ (32%) as compared to MZ twins (12%,  $P < 0.01$ ).

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