

# PITUITARY GONADOTROPINS AND MULTIPLE BIRTHS IN NIGERIA

P.P.S. NYLANDER

University College Hospital, Ibadan, Nigeria

---

*Radioimmunoassay of FSH and LH serum levels has been carried out on 15 Nigerian women, 6 of them mothers of singletons and 9 mothers of twins (2 of two sets). Higher FSH levels have been found in mothers of twins, which supports the view that a higher production of pituitary gonadotropins, resulting in a higher incidence of multiple ovulation, may be responsible for the higher incidence of twinning in Negro populations.*

---

The twinning rate among the Yorubas in Western Nigeria is very high, approximately 50 per 1000 maternities. This rate is four times that in Caucasian populations and is the highest on record (Nylander 1970a).

The reason for the high twinning incidence is as yet not very clear, but it has been suggested (Milham 1964) that the production of pituitary gonadotropins may be higher in Negroes than in Caucasians, resulting in a higher incidence of multiple ovulation and multiple pregnancy in Negro populations.

This paper reports the results of a small pilot study in which serum pituitary gonadotropin levels (FSH and LH) in Nigerian women who have delivered twins are compared with corresponding levels in those who have delivered only singletons.

## MATERIALS AND METHODS

The study was commenced in University College Hospital, Ibadan, in February 1971, and 15 Yoruba women volunteered for it. Two of them had delivered two sets of twins, 7 had delivered only one set of twins, and 6 had delivered only singleton babies. Their ages ranged from 26 to 45, they were all in good health and their menstrual periods had been normal for at least 6 months previously.

Blood was taken from each subject from the 7th day of the menstrual cycle for 10 days, so as to include the mid-cycle FSH and LH peaks. The blood was spun within a few hours of collection and the serum stored in deep freeze ( $-20^{\circ}\text{C}$ ). The frozen samples were flown in refrigerated containers to the Obstetric Department, University of San Diego, where radioimmunoassay of FSH and LH was carried out.

The methods used for the assay are the same as those described by Midgley (1966, 1967) and by Yen et al. (1970).

## MEAN FSH LEVELS AND TWINNING

Because of variation in the duration of the menstrual periods in the women in this study, comparison of gonadotropin levels between mothers in different groups has been carried out by regarding the day of the FSH or LH peak as day 0 and relating the other days to this.

Fig. 1 shows the mean levels of serum FSH in mothers who have had twins and those who have had singletons only. In both groups the levels rise up to a peak on day 0 (33.7 and 27.1 mIU/ml respectively), but the levels in mothers who have had twins are higher than those for mothers of singletons on corresponding days.

In Fig. 2, a comparison of mean FSH levels at the peak has been made between the three groups of mothers: those who have had two sets of twins, one set of twins, and singletons only. The levels are higher in the mothers of two sets of twins (peak value = 39.8 mIU/ml) than in mothers of one set of twins (peak value = 32.0 mIU/ml). The levels in the latter group are in turn higher than those in mothers of singletons (peak value = 27.1 mIU/ml).

#### MEAN LH LEVELS AND TWINNING

Fig. 3 shows the mean LH levels in mothers of twins and singletons. (The mid-cycle LH peaks invariably coincided with the mid-cycle FSH peaks.) The LH levels in both groups of women rise up to a peak on day 0 and then fall off rapidly. The mean LH value at the peak for mothers of twins (158 mIU/ml) is higher than that in the mothers of singletons (126.3 mIU/ml), but the LH values on the other days are not consistently higher in the mothers of twins. Furthermore, when comparison is made of LH values in the three groups of women — mothers who have had two sets of twins, one set of twins, and singletons only — the highest mean LH value did not occur in the women who had two sets of twins; in fact the mean peak value for these mothers was lower than that for mothers of singletons.

#### DISCUSSION

The high twinning incidence in Western Nigeria is due to a high DZ twinning rate. In fact, it has been shown by typing of individual twin pairs at birth in a study of 18,737 maternities that 92% of newborn twins are DZ (Nylander 1970*a* and *b*). Also women who had delivered twins had a twinning rate which was twice that of their counterparts who had delivered only singletons. In view of these findings it is reasonable to expect that of the 15 volunteers who took part in this pilot study, the 9 who had had twins would have a greater tendency to twinning than the 6 who had had singleton births. It is also reasonable to assume that the women who had delivered two sets of twins would have the highest tendency to twinning.

Unfortunately, the number of women in this study is too small to show statistically significant differences. However, the higher level of serum FSH in the women who have had twins and the elevation of mean FSH levels with number of twin sets delivered are very suggestive that there is an association between serum FSH levels and the tendency to twinning. There does not appear to be any consistent relationship between mean serum LH levels and twinning.

It is likely that the high FSH levels in the mothers of twins have led to increase stimulation of the ovaries causing double ovulation and twin pregnancy. This view is supported by the fact that treatment with exogenous FSH in some infertile women has been followed by elevation of serum FSH levels and multiple births (Gemzell 1964, Jacobson et al. 1968). The mechanism by which a higher mid-cycle FSH peak can cause multiple ovulation is not yet clear. It is possible that such a peak in one cycle may lead to increase stimulus to

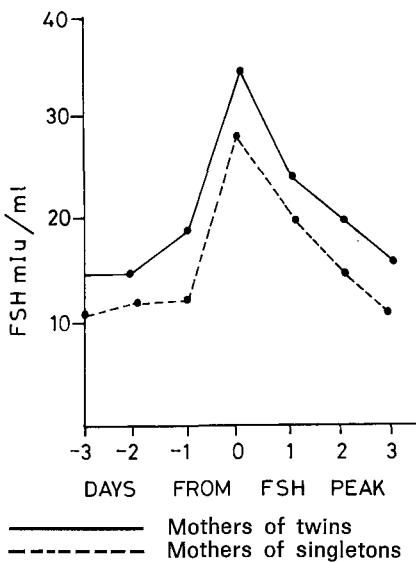


Fig. 1. Mean FSH values in mothers of twins and of singletons

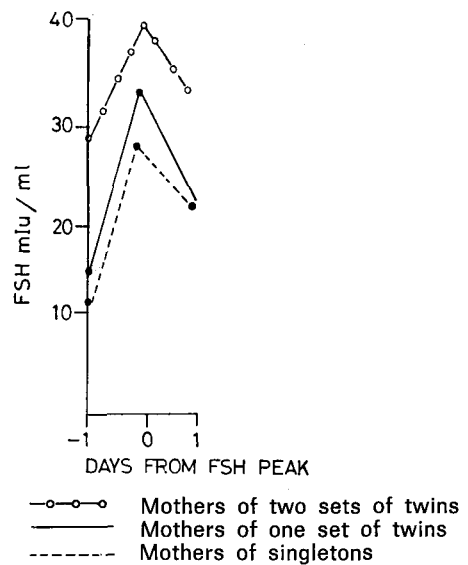


Fig. 2. Mean FSH values in mothers of two sets of twins, of one set of twins, and of singletons

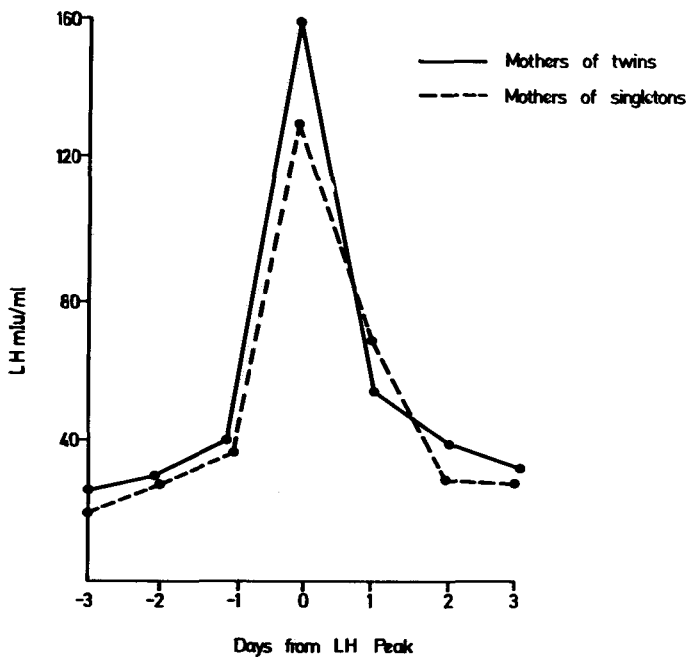


Fig. 3. Mean LH values in mothers of twins and of singletons

folliculogenesis in the succeeding cycle, thereby causing the development of more follicles and subsequently multiple ovulation (Yen 1971). On the other hand, the higher FSH peak observed in the mothers of twins may be part of a higher FSH level throughout the whole of the menstrual cycle and the stimulus to increased folliculogenesis could then be due to the high FSH level in the first half of that cycle.

To elucidate these problems, further studies are indicated on larger groups of women in whom daily FSH and LH serum levels are studied throughout the whole cycle. Comparisons could then be made between the groups: mothers of twins and mothers of singletons, after standardizing for maternal age, parity, and social class.

#### ACKNOWLEDGEMENT

This study was supported by a travelling grant from the Rockefeller Foundation. I wish to thank Dr. Rajan and Dr. S. Yen of the Obstetric Department, University of San Diego, for the use of their laboratory in performing the assays, and Dr. L. Ajabor for his assistance in carrying out the LH assay.

Prof. P.P.S. Nylander, University College Hospital, Ibadan, Nigeria.