Lactational Amenorrhoea/ Anovulation, Maternal prolaction levels and infant feeding patterns : A comparative study between well-nourisshed and undernourished women

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Abstract:

Lactational amenorrhoea, which contributes largely to fertility control, is affected by several factors related to the mother, infant and the environment. However, the maternal nutritional status has shown inconsistent effects on lactational amenorrhoea. Thus in the present study, the duration of lactational amenorrhoea/anovulation was compared between undernourished and well-nourished women while taking into account the other factors such as infant feeding pattern and maternal basal prolactin levels which are known to influence postpartum fertility. Thirty matched pairs (matched for parity) of well-nourished (body mass index =26.00kg/m2) and undernourished (body mass index = 19.00 kg/m 2 otherwise healthy postpartum women were studied prospectively until they had 3 regular menstrual periods. Information on infant feeding pattern (by 24-hour recall) and menstrual status were collected weekly and maternal basal prolactin, maternal body mass index and infant weight measured four weekly. Ovarian activity was assessed using weekly urinary oestrone - 3- glucuronide and pregnanediol-3a - glucuuronide concentrations. Survival analysis with log rank test, paired t test, chi-square test, and parametric and non-parametric correlation tests were used for data analysisas appropriate. The duration of lactational amenorrhoea was significantly shorter (median 16 weeks vs 19.5 weeks; $p<0.01$) in the well-nourished group but the time of resumption of ovulatory menstruation did not differ significantly between the two groups. A significantly higher ($p<0.05$) number of first regular menstrual bleeds were anovulatory in well-nourished women. A significantly higher ($p<0.05$) number of undernourished women gave supplementary formula feeds from 8 to 24 weeks postpartum. Maternal basal prolactin concentrations, frequency (total/24h, daytime, night) and duration of total breast feeds/24h, number of subjects giving water and non-caloric liquids, caloric liquids and semisolid and solid feeds, and infant weight adjusted for birth weight were not significantly different between the two groups at similar postpartum intervals. Synchronization of data to the onset of menstruation showed higher prolactin concentrations, a higher frequency of breast feeds and a lower frequency of formula feeds at the onset o regular menstruation in wellpnourished wimen. However, prolactin concentrations and the freq8ency of breast feeds were comparable between the two groups and the difference in the frequency forula feeds was less evident at the onset of regular ovulatory menstruation. Duration of lactational amenorrhoea showed a significant negative correlation with maternal body mass index when the undernourished and well-nourished groups were analysed together. Thus, improved maternal nutritional status appears to override possible inhibitory effects of prolactin and sucking on resumption of regular menstruation postpartum, but fails to counteract inhibitory effects on ovulatoru development and/or corpus luteum function. Further studies are required to unravel the molecular mechanisms responsible for these events. The problem of storing a large number of liquid urine samples in frozen state for lengthy periods for

serial measurements of hormone metabolites led to the next part of the study. Although the use of paper impregnated with urine stored refrigerated has been tried in temperate climates, it feasibility in tropical humid environments is not known. Thus oestrone-3-glucuronide and pregnanediol-3a - glucuronide levels were measured by enzyme immunoassay during normal menstrual cycle using pH paper impregnated with urine and stored refrigerated or at room temperature for varying periods of time, and in liquid urine stored frozen. Impregnated paper and liquid urine showed comparable patterns of oestorone-3-glucuronide and pregnanediol-3a-glucuronide excretion and the values correlated significantly($p < 0.01$ to 0.0001) when paper was stored either refrigerated for 3,6,9 and 12 months or at room temperature for 1 and 6 months. Thus, impregnated paper can be used for facilitate sample collection, transport and storage when oestrone-3 glucuronide and pregnanediol-3a-glucuronide measurements in a large number of serial samples are required to assess ovarian activity.

Key Words : Infant / Nutritional Status / Amenorrhea / Anovulation / Fertility-pysiology / Postpartum Period Lactation / BREAST FEEDING / Maternal Nutrition Physiology