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Birth Weight and Its Association with Maternal Nutrition and Socioeconomic Variables in Rural Bangladesh

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Objective: Examine the distribution of birth weight and its relationship with maternal nutrition and major socioeconomic variables.

Methodology: Between October 1995 and November 1996 at Matlab, 675 women, at 5-7 months' gestation period, were enrolled in a controlled diatary supplement intervention. Half of the women (n=341) received daily dietary supplement of 20 g soybean oil. Maternal nutrition status (weight, height, and MUAC) and socioeconomic variables (maternal education, parity, family size, household income, and land ownership) were measured at baseline, and infants' birth weights were taken within seven days of delivery. Gestational age was calculated from the last menstrual period. Analyses were conducted on 564 (83%) mother-infant pairs with complete data.

Results: Preliminary results showed no significant association between dietary supplement and mean birth weight or low birth weight. Mean (SD) birth weight for the entire sample was 2,520 (440) g, and the incidence of low birth weight was 47%. Maternal weight in mid- or late pregnancy, non-primiparity, and larger family size (>4) had significant positive association with birth weight. While short stature and primiparity were found to have significant negative association with low birth weight.

Conclusion: The findings suggest that small amount of calorie supplementation during pregnancy has no effect on birth weight in the study population. These results also suggest that poor maternal nutrition status, but not the socioeconomic status, is the major determinant of birth weight in rural Bangladesh.

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Determinants of Infant Growth in the Slums of Dhaka City: Size and Maturity at Birth and Breast-feeding

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Objective: Investigate the effect of low birth weight (LBW), intrauterine growth retardation (IUGR), prematurity, and breast-feeding on infant growth.

Methodology: The sample consisted of 1,654 infants born in selected slum areas of Dhaka city. They were enrolled at birth and followed up prospectively till their first birthday. Apart from repeated anthropometric measurements, the mothers were also interviewed for information on infant feeding and morbidity at each follow-up visit. Analytical techniques included correlation analysis and random effects regression for modelling infant growth.

Results: Correlation was high and stationary between repeated body weight measurements from 3 months onward. Correlation between weights before 3 months and later weights was lower and declined rapidly with increasing age gap, suggesting greater plasticity of growth in the first 3 months of life. After adjusting for other variables, the mean differences in body weight by birth weight, IUGR, and prematurity categories remained constant throughout infancy. For example, low- and normal-birth-weight infants differed by 556-603 g, while the differences between symmetric and asymmetric IUGR babies were 172-184 g. A positive impact of exclusive breast-feeding in the first 3-5 months on infant growth was detectable at 12 months of age (+95g). The overall growth in this sample was of the pattern that heavier babies grew even heavier. However, exclusive breast-feeding appeared to counteract this pattern by equally benefitting the lighter and heavier infants.

Conclusion: The study has demonstrated the important role of weight at birth and appropriate breast-feeding practices in determining nutritional status in infancy. Effective strategies for improving birth weight, till now a poorly-addressed issue in Bangladesh, are urgently needed. The sustained effect on growth and the beneficial effect on LBW infants are compelling reasons for increased and effective promotion of exclusive breast-feeding in early infancy.

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Mineral Status in Relation to Rickets in Chakaria, Bangladesh

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Objective: Explore the aetiology of rickets in Chakaria and identify opportunities within the local food system to prevent the disease. The rickets prevalent among children of the Chakaria region of Bangladesh is not usually associated with vitamin D deficiency. Therefore, Ca-deficiency would appear to be at least a predisposing factor in its aetiology. That rickets has emerged as a public health problem in Chakaria within the last two decades suggests that changes in food habits and/or environmental exposures may have contributed to the disease either by reducing Ca intakes (e.g. reduced access to Ca-rich foods) or use (e.g. increased exposure to such Ca-antagonistic factors as Al, Pb, Cd, F, Sr, Ba, low P, low-B). The Chakarian food system has indeed changed during this time: winter rice (requiring irrigation during the dry season) has been introduced; shrimp production in flooded paddy fields has increased; deep tubewells have been drilled to provide potable water.

Methodology: Mineral analyses were done on samples of whole blood and foods collected from the Chakaria region in October 1997. Blood was obtained from children aged 36-98 months identified by their families as either rachitic (n=11) or unaffected (n=8), who were each given physical and radiographic examinations (results reported separately). Samples of drinking water from tubewell, cooking water (pond), and cooked and uncooked rice were collected from three households, one of which had rachitic children. Samples of other