

Anthropometric measurements in a well-baby clinic, Riyadh, March 8-28, 1997

Primary health care centers (PHCCs) in Saudi Arabia provide regular checkups for children aged 0 to 5 through the well-baby clinics. The checkups include anthropometric measurements, the study of human body measurements, especially on a comparative basis. The measurements are taken when a child is vaccinated as well as four additional times during regular clinic visits in the first 5 years of life. Beyond this point there is no routine reporting of under- or overnourished children or reporting of anthropometric data. The Field Epidemiology Training Program (FETP) conducted a cross-sectional study to measure nutritional status for children under 5 years of age who attended a well-baby clinic and to discover ways to improve the nutritional surveillance system.

We conducted the study at a selected well-baby clinic (out of 54 PHCCs) in the Rawda district of Riyadh. There were 484 children involved in the study, aged 0 to <5 years, which ran from March 8 - 28, 1997 (29/10 - 19/11/1417H). A questionnaire about feeding history, history of diarrhea, family size and other anthropometric data was completed by clinic nurses through interviews with the persons accompanying target children and through vaccination cards. Weight and length or height were obtained by measuring the children during the visit. A p -value of <0.05 was considered significant.

Of children who visited the Rawda PHCC, 14% had a recorded low birth weight (LBW). The mean weight-for-age index (WAZ) was slightly lower than the World Health Organization reference standard. Underweight children (<-2.0 z) accounted for 3.7% of the population compared to the 2.1% expected from the reference standard (the z-score noted is the standard deviation score of anthropometric indicators). The height-for-age (HAZ) of 6% of children was below (-2.0 z) the 2.1% expected from the reference standard ($p<0.05$).

The mean WHZ of 4.5% of the children exceeded 2.0 z compared to the 2.1% reference standard. Multiple regression analysis of WAZ, HAZ, and WHZ against four explanatory variables revealed that only age and birth weight were associated with changes in WAZ, HAZ, and WHZ. Excluding birth weight from regression analysis, differences in anthropometric scores related to total siblings. A decrease of -0.55 WAZ (95% CI -0.076, -0.034) was most evident between 0 and 18 months of age. WAZ and WHZ decreased with an increasing number of children in the family. The WAZ for families of 1 to 3 children was not different from the reference standard. However, for all families with more than 3 children, WAZ was less than -0.32 and differed from the reference standard ($p < 0.01$ t-test). There was an association between Saudi nationals (82% of children) and decreased WAZ and WHZ. Of mothers, 84% began weaning within the normal age range recommended by pediatricians. We found no association between WAZ, HAZ and WHZ and the initiation of weaning. There was no association between breast-feeding or artificial feeding and deviations from reference anthropometric values or between recent diarrheal illness and decreased anthropometric indices.

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Editorial note: Nutritional surveillance and anthropometric measures are important tools in developing meaningful indicators for assessing the health and nutritional status of children and in establishing growth reference curves to compare the observed anthropometric measurements with expected values (1,2). An association of low anthropometric scores with age, Saudi nationality, birth

weight and total siblings was found. The mean for WAZ in our study was only slightly different from the reference standard. This difference could be accounted for by low birth weight, genetic factors, or undernutrition. The association with Saudi nationality could represent genetic factors or problems related to nutrition practices in Saudi households. Other factors that could indicate less than perfect feeding, such as recent diarrhea, breast-feeding or age at weaning, showed little effect on anthropometric scores. Only total siblings in a family showed a relationship; this could reflect a family's socioeconomic level or education, or the time and attention paid to individual children by the mother. The irreversible association found between WAZ, HAZ, WHZ and age may be because undernutrition occurs with increasing age. We saw no association of anthropometric scores with weaning or breast-feeding, so it is unlikely that lower scores were related to infant feeding practices. It is possible that infants were above normal size resulting from some factor such as a high prevalence of gestational diabetes. The decrease with age would then be caused by infants of diabetic or pre-diabetic mothers losing their excess birth weight. Collection of anthropometric data is routinely done in well-baby clinics but no targeting is done for nutritional surveillance. These data would be useful for targeting purposes, such as the study of individual types of nourishment on a population basis.

References:

1. Physical Status: The use and interpretation of Anthropometry. WHO technical report series, World Health Organization, Geneva: 1995.
2. Yip R, Mei Z. Variation of infant and childhood growth: from the U.S. Nutrition surveillance systems from: Maternal and extra-uterine nutritional factors: their influence on fetal and infant growth, 5th International Workshop; 1995, Salamanca, Spain.