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Nutritional Status of Nigerian Village Twins

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Nutritional status of 19 pairs of twins and 17 singleton controls was assessed by measuring dietary intake and selected anthropometric and biochemical parameters. The results indicated no significant variations between first and second twins and singleton controls and between all twins and controls for all parameters studied. Significant variations were found in serum α -globulin and protein and energy intake when male and female twins were compared with male and female controls.

Key words: Twins, Nutritional status, Dietary intake, Nigeria

INTRODUCTION

Nutritionally, twins are regarded as a vulnerable group. At present no information is available on their nutritional status in Nigeria. To provide basic data on food intake, growth patterns, and biomedical parameters we decided to study the nutritional status of twins using selected dietary, anthropometric, and biochemical indicators.

MATERIALS AND METHODS

Nineteen pairs of twins aged 2–9 yr and 17 singletons matched for age, sex, and socioeconomic status were selected from five villages located within 20–35 km from Ibadan and studied cross-sectionally. Longitudinal data on seven pairs of twins available in the clinic at Osegere were also included.

Dietary intake was obtained by 24-hr recall method in separate sittings for 3 consecutive days by administering a structured questionnaire to mothers by a single interviewer, a MSc in Human Nutrition.

In the villages where the study was carried out, most of the food given to the children was bought by the mothers from the vendors who sell it in standard wrappings at standard prices. Over the years we have developed methods for quantifying food intake from average weight of standard wrappings and recording of the prices. The composition of mixed foods was determined by weighing the ingredients of recipes of the vendors. This information was supplemented by information on food cooked at home in local measures and recording its weight.

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Weight, height, midarm circumference, and triceps skinfold thickness of the children were measured by standard methods [2]. Blood for microhematocrit, prealbumin, and protein electrophoresis was obtained by finger prick. Standard methods were used for determination of microhematocrit, prealbumin [3], electrophoretic determination of protein [6], and 24-hr urinary creatinine [5]. Longitudinal data on height and weight were obtained by measuring the children monthly and were compared with the average height and weight of 312 0–5-yr-old children from the same village [4]. The nutrient intake was calculated from food consumption data using the food composition table for Africa [1]. The children were divided into three groups: 1) first and second twins and controls, 2) male and female twins and male and female controls, and 3) combined twins and controls. An analysis of variance (ANOVA) was performed and mean, standard error, F-ratio, and F-probability were calculated.

RESULTS

The results of the analysis of variance of cross-sectional data on height, weight, triceps skinfold thickness, midarm circumference, serum prealbumin, serum albumin percent, α -globulin percent, α_2 -globulin percent, hematocrit, 24-hr creatinine, and intake of selected nutrients by all twins and controls showed that there were no significant variations between twins and controls in any of the parameters studied. Similarly, no significant variations between first and second twins and controls were found. Significant variations, however, were found in α -globulin percent and intake of energy and protein between male and female twins and male and female controls. The variations in serum α -globulin percent and protein intake remained significant after elimination of the effect of weight and age individually, but the variations in energy intake became nonsignificant when the effect of weight was taken into account ($P < 0.188$). Additionally, variations in height became significant ($P < 0.052$) when the effect of age was removed but remained unaffected by weight. Longitudinal study of heights and weights of twins showed that, apart from minor fluctuations, the pattern of weight gain in first and second twins and singleton children was similar, but heights in singletons remained slightly higher than those of twins. Twenty-six percent of twins and 23.5% of controls were found to be mildly malnourished on the basis of weight for height. On the basis of weight for age, 31% of the twins were classified as mildly, 34% as moderately, and 26% as severely malnourished against 29% mildly, 35% moderately, and 12% severely malnourished in controls. Fifty percent of the twins had low levels of prealbumin (less than 20 mg/100 ml) against 35% in controls. The serum α -globulin percent was high (24%) and 24-hr urinary creatinine was extremely low (219–238 mg) in both groups. The twins consumed 50%, 40%, and 64% of the recommended allowances of energy, riboflavin, and calcium, respectively, against 54%, 42%, and 60% by the controls. The protein intake by twins met 91% of the recommended allowance as against 104% by twins. Both vitamin C (127–141% RCA) and iron (117–133% RCA) intake were adequate in both groups.

DISCUSSION

The findings that anthropometric and biochemical parameters and the intake of various nutrients did not significantly differ between first and second twins and between all twins and controls indicate that their subjects were all exposed to similar environmental factors. Also the similar pattern of growth of twins and singletons, as shown by longitudinal data from the village and the growth pattern reported for singletons elsewhere [4], suggests that the twins are not different from other children in the area.

The gross inadequacy of energy, riboflavin, and calcium intake is reflected in the poor growth pattern of both twins and controls. High incidence of biochemical protein deficiency, as indicated by low prealbumin level, in the face of nearly adequate dietary intake is likely to be secondary to dietary energy deficiency. Widespread prevalence of infection and infestation might be responsible for high α -globulin levels in both groups. Low 24-hr urinary creatinine levels are indicative of an unsatisfactory state of muscle mass both in twins and controls. It must, however, be realized that those twins who have survived infancy are a biologically superior group compared to ordinary singleton controls, and data should be interpreted keeping this in mind.

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