

A SOCIAL AND NUTRITIONAL SURVEY ON THE POPULATION OF THE CHILDREN AND YOUTH CENTER OF MEHARRY MEDICAL COLLEGE OF NORTH NASHVILLE, TENNESSEE

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America has recently been made aware of the nutritional problems that exist within her own United States. In order better to define this problem and to locate it, this survey of the population of the children of North Nashville, a black ghetto, was done during the summer months of 1969. A random sample of 50 Children and Youth Center's (C&Y) patients were studied with respect to their social situation and their nutritional status.

PROCEDURES

Patients were seen daily in the C & Y clinic by Mr. Bell and questionnaires designed to obtain social and nutritional information were applied to them in a uniform manner. A complete history and physical examination were done to rule out the presence of any other pathologic states which would affect the nutritional survey. Blood samples were taken from all patients and sent to the laboratory. The information obtained was analyzed with respect to averages, range, standard deviation, standard error, trends associated with increasing ages, and a study of the frequency of low serum hemoglobin (Hb), hematocrit (Hct), vitamin A, vitamin C, and protein levels seen during the experimental period.

METHODS AND MATERIALS

A standard questionnaire was designed to give an accurate but brief picture of the patient's social setting. The information obtained from the questionnaire was as follows: number present in home, head of home, mother's education, father's education, marital status of the mother, home rental or ownership, average monthly income, number of siblings present in the home, amount of money spent for food per week, vitamin supplements, mother's occupation, and father's occupation. From these indices, it was felt that a rather brief and concise evaluation of this population's social setting could be obtained.

To evaluate the nutritional status of this population, it was necessary to make sure this sample was (other than nutritional deficiencies) healthy. This was done by obtaining a complete physical examination and history of all the patients seen. Again, a standard form and procedure was designed to measure indices of the patients nutritional status. Sex; age; normal birth weight or low birth weight, or prematurity; actual birth weight; feeding type (breast, formula, or both); somatotype (normal, obese, slender, undernourished); age adjusted heights and weights; skinfold thickness of the triceps area; Hb,

Hct; presence of sickle cell hemoglobinopathy; serum carotene; serum vitamin A; serum vitamin C; total serum protein with and without serum blank; serum albumin, total globulin, alpha 1 globulin, alpha 2 globulin, total alpha globulin, beta globulin, and gamma globulin in grams percent; serum albumin, alpha 1 globulin, alpha 2 globulin, total alpha globulin, beta globulin, and gamma globulin in percent; and albumin/globulin ratio were some of indices that were measured by this analysis.

The dinitrophenylhydrazine method was used for the determination of vitamin C levels; a modified biuret technique was used to determine total serum protein, albumin, and globulin; the procedure employed for serum vitamin A and carotene determinations was the trifluoroacetic acid method as outlined in the ICNND manual; and serum electrophoresis was used for quantitative and qualitative analysis of the serum.

RESULTS

The results obtained from the social questionnaire were as follows: 1. The average number of people in the home was 6.5. 2. The head of the home in 44% of the cases was the mother, in 28.7% was the father, and in 27.3% was the grandmother. 3. The average mother's education was about 10th grade and the average father's education was about 10th grade. 4. The marital situation of the mother in 21% of the cases were single, 37% separated or divorced, 5% were widowed, and the remaining 37% were married. 5. Only 17% of the families owned their homes. 6. The average monthly income was \$222, and the average money spent for food during any given week was \$28.50 (for an average of 6.5 people). 7. The average number of siblings of the patients in question was 3.2. 8. Only 9% of the children seen were receiving daily vitamin supplements. 9. Twenty-one percent of the mothers were housewives, 36% were employed, and 23% were receiving Aid to Dependent Children (ADC) or Social Security. 10. Of the 28.9% of the population in which the father was present in the home, 85% of them were employed.

A summary of the people being studied revealed that: 1) fifty-eight per cent were males and 42% females; 2) the average age was 9.6 years; 3) the per cent of the patients studied that were premature was 8%; 4) the average birth weight of the children was 6.7 pounds; 5) seventy-eight per cent of the patients were formula fed, 8.3% were breast fed, and 13.7% were fed by both methods; 6) analysis of the patients' body somato-

types revealed that 70% were normal, 4% were obese, and 26% had a slender body type; 7) age adjusted weight and height of the patients showed a normal distribution similar to the distribution of studies done on children in Boston, Massachusetts, and 8) four per cent of the patients studied had sickle cell hemoglobinopathy.

Laboratory information was compiled and the laboratory picture of this population was as follows: 1) average triceps skinfold thickness was 7.4 mm. and there appeared to be a trend of increasing thickness with age; 2) the average Hb was 12.9 g% and the average Hct was 38.8%; 3) carotene levels were 99.74 $\mu\text{g}\%$ with lower levels in the 6 to 11 month old age group, but with no significant difference between the other age groups; 4) twenty-seven and seven tenths $\mu\text{g}\%$ was the average vitamin A determination value of this population, and there appeared to be no trends with respect to age; 5) the average measure of serum vitamin C in these patients was 1.55 mg% and there appeared to be no variation with age; 6) average total serum protein level (with consideration of serum blank) was 6.6 g%, and, as before, these values increased with increasing ages; 7) the average albumin was seen to be 4.28 g% and the average globulin was 2.9 g% (both values followed the same trend as the total serum protein with respect to age); and 8) the average albumin/globulin ratio was 1.46 which is considerably lower than the values reported for white and black children of higher social status. In the 6 to 11 month old age group there appeared to be a relatively high albumin/globulin ratio of 1.8, but in all of the other age groups there was no discernible trend with age.

Analysis of the laboratory results with respect to Hb, Hct, serum carotene, serum vitamin A, serum vitamin C, and total serum protein (with consideration of serum blank) revealed the following: 1) there was 8% of the population with a Hb value below 11 g% (with a range of 7.4-11.0 g%, and an average of 8 g%); 2) ten per cent of the patients seen had a Hct value below 34%; 3) with respect to serum vitamin A levels, 16% of the population studied had vitamin A levels below 20 $\mu\text{g}\%$; 4) six per cent of the patients had vitamin C levels below 0.5 mg%; and 5) with regards to total serum protein analysis with consideration of serum blank, 38% of the population had serum protein levels below 6.5 g%.

CONCLUSION

The analysis of the social information obtained from this study of 50 Children and Youth Center patients

illustrated that approximately \$28.50 was spent for food in one week with an average number of 6.5 persons in a household. The average monthly income of these families was \$222 with 82% of this population renting their homes. Ninety-one per cent of the children were not receiving vitamin supplements. The father was present on the scene in 29% of the cases and of these 85% of them were employed. Twenty-two per cent of the mothers or grandmothers that were head of the home received income from Aid to Dependent Children (ADC) or Social Security (it was noticed that a woman with 2 children receives \$105 per month and that a woman with 7 children receives \$120 per month).

The distribution of the growth curves of these low social class, black children of North Nashville do not appear to be any different from those of the middle class, white children of Boston, Massachusetts. The electrophoretic studies also seemed to match those given as normal values, although the albumin/globulin ratio was lower in this group of children (probably due to the effect on gamma globulin by chronic and recurrent infections). With respect to Hb and Hct levels, there was an obviously lower average value for these children than values given as normal.

With respect to the vitamin levels, using the criteria set forth by the Interdepartmental Committee on Nutrition for National Defense; 18% of the patients have very low vitamin A levels, with 6% of these classified as deficient; 6% have low vitamin C serum levels; and over 38% have low protein levels with 22% of these classified as deficient.

In conclusion, 50% of the population studied had low or deficient levels of one parameter, 8% had low or deficient levels of two parameters, and 6% had low or deficient levels of three parameters; which is a total of 64% of the total population which exhibit deficient or low levels of nutrition.

SUMMARY

During the summer months of 1969, 50 Children and Youth Center patients were studied with respect to social and nutritional status. The social information was obtained by questionnaires, and the nutritional information was gained by physical examination, measurement of growth parameters, hematologic parameters, protein analysis, and biochemical analysis of vitamins A and C. The results of this study revealed that more than one-half of the population studied was deficient or of low levels concerning nutrition; a situation promoted by their low social status.

HOWARD RECEIVES SLOAN AND NIH GRANTS

The Alfred P. Sloan Foundation has made a grant of \$450,000 to the Howard University College of Medicine. Of this sum \$350,000 will be used over a three-year period for an experimental accelerated medical education program and \$100,000 to establish a fund-raising office for the medical school.

Under the program, an initial 20 students will enter medical training during their third year as undergraduates. The over-all length of medical-degree preparation will be reduced from eight years to six or less.

It is believed that the Howard program, if successful, could have a substantial impact on medical education at