

A NUTRITIONAL STUDY OF TRIBAL AND NON-TRIBAL CHILDREN IN THE UDAIPUR REGION

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ABSTRACT

Objective: There is an evidence that nutrition has a significant impact on children's development, adult health, and senescence. It is also known to have an impact on one's physical and mental faculties. Malnutrition is now understood to be the root cause of a significant variety of health issues. To compare the nutritional condition of 300 (tribal and nontribal) children living in the Udaipur region, a dietary survey was conducted.

Methods: In the present study, 300 tribal and non-tribal children between the ages of 1 and 12 were chosen for a dietary survey to evaluate their nutritional status. The survey was conducted using a questionnaire.

Results and Conclusion: The statistics between tribal and non-tribal children showed that calorie, protein, fat, and carbohydrate intake was lower in the tribal children. When we compared the data between tribal and non-tribal children, we found that the non-tribal children's calorie, protein, fat, and carbohydrate intake was not superior. Ascorbic acid and B-carotene intake among non-tribals is also less than that advised by the ICMR and is approximately twice as low as that among their tribal counterparts. The statistics on tribal and non-tribal children made it abundantly evident that nutritional intake is low that consumption of fat among dense nutrients is significantly lower and that intake of antioxidant nutrients such as ascorbic acid and beta-carotene is similarly poor.

Keywords: Tribal, Non-tribal, Nutrition, Nutrient antioxidant, Vitamins.

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INTRODUCTION

Man and diet are intimately and inextricably linked. Energy must be provided by oxygen to arrange multiple anatomical and physiological functions through metabolic reactions, and humans, who are heterotrophs, depend on food for all of these activities. It is not overstated to say that nutrition and oxygen play a significant role in the evolution, development, sustenance, and preservation of man. Although the body possesses a vast supply of antioxidants, only a small portion of the latter is mistakenly or consciously diverted to create reactive oxygen species, which are highly reactive [1-3] and must thus be constantly managed.

The typical animal life span has been reported to improve by 13–30% by optimizing body with these antioxidants, demonstrating the importance of nutritional antioxidants among these antioxidants [4]. Antioxidant intake has been found to be low in the majority of affluent populations and egregiously low in poor populations, which may tip the oxidant/antioxidant balance and create a pro-oxidant environment with a number of negative effects. These effects are anticipated to worsen if malnutrition or over nutrition is present [5-7]. The developmentally staged children are most vulnerable to these alterations. According to several of our prior investigations, undernutrition is rife in this area [7,8].

In the present study, the nutrient proteins, carbohydrates, lipids and nutrient antioxidant ascorbic acid, and beta-carotene were looked that how much are consumed by tribal and non-tribal children in various age groups.

METHODS

The study was carried out in Biochemistry department with the consent of the parents of the children participating in the study. To determine the daily calorie, fat, protein, carbohydrate, and vitamin intake among

300 tribal and non-tribal children, an oral questionnaire survey was done. The groups were formed and divided as Group 1 (4-and years), Group 2 (7.1–10 years, and Group 3 (10.1–13 years). The data were computed as per Gopalan *et al.* ICMR booklet, after recording the daily food consumption on a proforma that had been tested in advance [9,10].

RESULTS AND DISCUSSION

Children are more susceptible to nutrition marketing because they are in a growing stage. In the third world, at this time when demands are high owing to growth, diets are frequently insufficient and unbalanced because of poverty and a lack of suitable foods [11]. Parental ignorance and misconceptions about taboos, prejudices, and culinary customs further exacerbate the issue. In addition, it is a time of ongoing stress, bacterial, viral, and parasitic illnesses.

In this sense, the survey results of the youngsters in this series paint a bleak picture. Only 12% of children were normal, according to a NIN survey conducted between December 2021 and July 2022, while 67% of youngsters had some form of malnutrition. A follow-up survey conducted in 1988–1990 revealed that 80.1% of children were underweight [12]. However, neither of these surveys included any tribal children, whose manner of life differs greatly from that of non-tribal people. The study of Pinki *et al.* 1997 done on tribal children showed that in respective to calories, fat, carbohydrate, ascorbic acid, and b-carotene, they were 100% deficient and 90% in protein. In the study, the results showed 80% calories deficiency [13].

In India, there are more than 80 million tribal people. They remain ingrained in their own civilization and continue to rank as backward on the politico-socio-economic scale because they are intrinsically unwilling to embrace the changes brought about by modernization. Typically, they are barely able to survive. For this reason, native peoples are seen as a bridge between prehistoric and modern man and offer a wealth of useful data for scientific interpretations. Social

Table 1: Nutritional status of tribal male and female children

Parameters	Male children (n=167)	Female children (n=134)	Total (n=300)	p-value
Protein (g)	39.53±5	30.43±7	34.98±6	<0.0001
Fat (g)	10.33±4	8.22±5	9.27±4.5	<0.0001
Carbohydrates (g)	325±35	278±31	301±33	< 0.0001
Ascorbic Acid (mg)	7.4±2	7.2±4	7.3±3	0.57
β-Carotene (µg)	423±65	400±54	411±59.5	0.0011
Calories	1062±102	956±96	1009±99	0.0001

and government organizations are working hard to integrate them into contemporary society, where one of the key concerns is nutrition.

In the present study, tribal children between the ages of 3 and 13 years old had their protein, fat, carbohydrate, ascorbic acid, and beta-carotene intakes analyzed. The calorie intake was computed based on the consumption of nutritiously dense foods. Table 1 lists the nutritional consumption that was noticed in these kids. It is alarming to learn that undernutrition affects children of all age groups on a widespread basis. The study showed results comparable to the study of Pinki *et al.* that the tribal children were further classified according to socioeconomic status except protein, all nutrients intake was deficient.

This survey makes it quite clear that although service class tribals are now in a better economic position, none of them have yet attained the status of upper-middle or upper socioeconomic class but nutrient intake was low.

It is clear that they have a number of crucial nutritional characteristics. The picture was the same in the lower-middle and middle groups, with the exception that protein consumption was adequate in 38% and 12.6% of the children, respectively, in the 4–7 year age group. This was true for other nutrients investigated. All other nutrients were consumed by children in the 7.1–10 year age range, with the exception of protein, at rates of 45% and 10.5%, respectively. Some children aged 7.1–10 years consume all other nutrients besides protein. A tiny proportion of kids in the 7.1–10 and 10.1–13 year old age groups demonstrated appropriate intake of fat, protein, and ascorbic acid. In a male-dominated Indian society, it was encouraging to see that there was no discernible difference in nutritional intake between male and female children.

Indians consume significantly less fat than Westerners do, both in terms of recommended intake and actual consumption [11,14]. For young children, a 25 g intake of fat is advised, while older children should consume 22 gm. In the 3–7 year age group, it was as low as 6 g, while in the 4.6 year age group, it was 7–9 gm. Although a minimum amount of fat must be present in the diet to meet the demand of essential fatty acids, it did not even approach 50% of the necessary intake in older children. Using data from the ICMR, we were able to determine the intake of two nutrients that are antioxidants, such as β-carotene and ascorbic acid.

The ICMR recommends 1600 mg and 2400 mg of β-carotene per day for children in preschool (1–5 years) and school age (7–12 years), respectively. For the same age categories, daily needs for Vitamin A are 600 g and 600 g. Vitamin A deficiency, which is common in the diets of Indian poor people, will increase the need for β-carotene. In addition to being transformed into retinol, β-carotene also functions as an oxygen and superoxide ion scavenger [15,16]. Therefore, inadequate β-carotene consumption will result in both a decreased ability to act as an antioxidant and a decreased ability to generate retinol. In contrast to ICMR recommendations, β-carotene consumption ranged from 423±65 to 461±20 g/day in the age categories of 3–7, 7.1–10, 10.1–13, and 10–12 years old. Specifically, 382±195 g–569 ± 227 g, 517±266 g–858±341 g, and 502±208 g–1089±407 g/day. As a result, tribal youngsters consume very little of this pro-vitamin, and the poor socioeconomic category, which makes up the majority of tribals, consumes the least of it.

Ascorbic acid plays many different roles in the human body, and its effectiveness as an aqueous phase antioxidant is undeniable. ICMR has advised all age groups to consume 40 mg of this vitamin daily. Numerous research suggested increasing its consumption. The current data blatantly show very low intake of this nutrient. Its consumption in the corresponding age groups of kids was a pitiful 12%, 18%, 20%, and 2% of the recommended amount. Although we have not measured the intake of other nutrients, we can reasonably estimate that the diet should be lacking in other nutrients based on these analytical and survey results.

In conclusion, the data on tribal children clearly show that nutrient intake is low, that consumption of fat among dense nutrients is grossly low, that intake of two nutrient antioxidants—ascorbic acid and Beta-carotene—was only in the range of 10–20% of the recommended amount, and that the pattern of diet suggests that it may be deficient in other aspects as well, including nutrient antioxidants like retinol and other naturally occurring antioxidants present in foods. Therefore, it makes sense to assume that tribal children in the study area experience chronic undernutrition and, in addition to other nutritional insufficiency issues, frequently confront a subdued rancorous oxidant cellular milieu that may contribute to the clinical issues.

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CONFLICTS OF INTEREST

No conflicts of interest have been reported.

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ETHICS CLEARANCE

The Institutional Ethics Committee provided the ethical clearance certificate.

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