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Nutritional status of tribal preschool children based on clinical assessment in Paschimanchal, West Bengal, India

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Abstract--Clinical examination is one of the methods used to determine the nutritional status of a person or diagnosis of various diseases. This method is an important feature of every nutritional survey. It is most practical and simplest method of measuring the nutritional situation or diagnosis of diseases a group of individual. With this method, it is possible to easily understand the nutritional status or physical condition of individuals by deep concentration and observation. It utilizes a lot of specific and non specific physical signs and symptoms that are known to be associated with malnutrition and nutrient deficiency or communicable and non communicable diseases. To conduct this study, data from 258 children aged 1-5 years were collected by a community based cross sectional survey study by pretested questionnaire. Data is collected through door to door survey in multi stage cluster sampling method. Their information is collected is collected subject to the permission of the parent and the age information is determined by the birth certificate or the issued card by primary health center. Clinical signs for difference nutritional deficiencies disease and various communicable or non communicable diseases were observed. Difference sings of disease like general appearance, eye, skin, hair, mouth, oedema, bone etc is higher. Based on the results, it can said that the sing and symptoms of various clinical condition are very common them and their health condition is very bad.

Keywords---nutritional status, tribal preschool children, clinical assessment.

Introduction

The definition of health given by WHO in 1948 is-“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”(1). We use a number of methods to determine a person’s nutritional status or physical condition, such as anthropometric measurement, biochemical assessment, clinical examination and diet survey etc. Clinical examination is an essential feature of every nutritional survey. It is most practical and simplest method of measuring the nutritional situation of a group of individual (2). With this method, it is possible to easily understand the nutritional status or physical condition of individuals by deep concentration and observation. It utilizes a lot of specific and non specific physical signs and symptoms that are known to be associated with malnutrition and nutrient deficiency or communicable and non communicable diseases. General clinical examination, with special attention to organs like hair, angles of the mouth, skin, eyes, tongue, gums, muscles etc. The main advantages of this method are fast and easy, inexpensive and non invasive; the main disadvantages of this method are did not detect early cases and skilled people are needed. Detection of relevant signs helps in establishing the nutritional diagnosis. However the Central Government and the State Governments have been assisting through various projects at different times to overcome the above problems.

Clinical examination has very little information on indigenous peoples. However, the information available from the Raj Gond tribe in the central India state of Madhya Pradesh is the overall prevalence of sparse hair was found to be 18.7 %, depigmentation of hair (12.2%), oedema (9.8%) and easy pluckability of hair (4.9%) respectively. Besides of this study vitamin A deficiency (conjunctival xerosis) was reported at 18.7 %, while night blindness and bitot’s spots were not present. And vitamin B complex deficiency, mainly angular stomatitis and cheilosis, had higher prevalence (32.5% of angular stomatitis and 20.3% of cheilosis) compared to other nutritional deficiency signs and boys were affected more than girls. 17.1 % of children suffered from dental carries but very few from spongy and bleeding gums (3). In Chhattisgarh high rate of all clinical signs and symptoms like lack of lusture, sparse hairs, depigmentation hair, flag signs, easy pluckability, paleness of eye, angular stomatities, oedema, dental carries, bleeding gums are present of Gond and Kavar tribal preschool children (4). Another study of tribal preschool children in Bihar 14.5% having clinical sign of oedema and 5% having oedema and wasted (5). In the study of Jenu Kuruba tribal children (2-15 years) of Mysore district in Karnataka high prevalence of anemia, vitamin A deficiency and iodine deficiency and besides 68.5% had dental caries. Skin infections were highly prevalent with 19.8% had scabies and 33.8% of them had hypodermal lesions (6). Another clinical examination study of the Coimbatore district in Tamil Nadu shows that 69 percent of the tribal children had worm infestation and 28 percent of children have the complaints of tooth decay and 14 percent of children have dry hair and skin (7). Clinical signs for various nutritional deficiencies were also observed *Bhumija Munda* tribe in

Shamakhunta block of Mayurbhanj district in Odisha. Children of this area were examined for clinical signs of some deficiency diseases. Children had symptoms for vitamin A deficiency, pale conjunctiva was observed in 39.5%, bitot's spots and night blindness (in 4.65% each). Pale conjunctiva may also be indicative of iron deficiency among the studied population. Pallor (16.28%) and pigmentation (11.63%) of skin was observed suggestive of skin infections. Deficiency of Vitamin B complex was also observed in selected children in the form of symptoms like pale (16.28%), magenta (2.33%) and red raw (2.33%) tongue. Overall oral hygiene was poor among the children. Decayed, missing and filled teeth (DMF) were observed in 18.6 per cent and dental mottling was observed in 11.63 per cent (8).

Clinical examination data on indigenous children is rarely available in West Bengal. Of the 188 tribal children under the age of 5 years in Chanchal II block of Malda district, 45.74% suffer from anemia, 19.12% from angular stomatitis, 7.98% from glossitis, 2.13% from conjunctivitis xerosis, 0.53% from bitot's spots and 0.53% from spongy bleeding gum (9). Another study on the data available on clinical examination of Bankura district in West Bengal shows that- high rate of lack of luster, sparse hair, discoloration of hair, flag sign, easy pluck ability, moon face, cheilosis, dental caries, spongy gum, xerosis etc (10). Bagchi Tilak (2019) the information he collected from Belda Primary health centre and Makrampur subsidiary health centre, he found that Lodha, Munda, Mahali, Kora and Santal children suffering from high rate of hookworms, tapeworms, dysentery, protozoa, diarrhea, skin disease, loss of luster of hair and skin, discolor and thin hair, vitamin A, D, C, B₁ deficiency disease, bleeding gum and anemia (11).

India is second to Africa around 705 tribal groups and subgroups including 75 particularly vulnerable tribal groups (PVTGs). They comprise approximately 8.6% of the total population in India (12). In West Bengal About 5.8% of the total population is indigenous and the most part of them live in the eastern region of the 'Chhotanagpur' plateau which we have known as 'Jungle Mahal' (13). The Paschimanchal region comprises of a huge piece of Paschim Medinipur, Jhargram, Bankura, Purulia, and a small part of Paschim Burdwan and Birbhum districts. The major tribal communities of this area are Santal, Oraon, Munda, Bhumij, Kora, Lodha, Mahali, Savar and Birhor, etc. Among them, Lodha and Birhor are notified as Particularly Vulnerable Tribal Groups (PVTG). Besides this enormous number of tribal people reside in rural areas; a large portion of them were illiterate and very low-wage unskilled laborers. The tribal populations of this region are perceived as socially and financially insecure (14-16). Their ways of life and food propensities are not the same as those of their neighbors (17). Their living strategies is unique and fully dependent on settled cultivation, forest product collection, hunting, fishing, along with a small sector of Government service and business. When all is said in done, tribal populations are viewed as oppressed in India (18-19).

Methodology

Study area and people

This cross-sectional investigation was led from April 2021 to August 2021 in Ranibandh block of Bankura district, West Bengal. Ranibandh block situated at 22°52'N and 86°47'E and is 83 meters above the sea level. Ranibandh block is situated approximately 60 km south from the Bankura district headquarter and 216 km from Kolkata the provincial capital of West Bengal. As per the census of India 2011, the Ranibandh block had a total population of 119,089 among them 47.07% were Scheduled Tribes and 0-6 years aged children were 13922. This block is "Heartland" of ST populations of Jungle Mahal. Ranibandh CD block had one rural hospital and four primary health centre with total 84 beds and 8 doctors.

The subjects for the present cross sectional study were collected from several villages of eight gram panchyte of Ranibandh community development block of Bankura district in West Bengal. A total of 253 children aged 1-5 years were measured in the present study to assess the nutritional status. The vast majority of the adult population in the studied household is engaged in unskilled manual labor; like cultivation, wood-cutting and leaf collection, etc. So, they belong to lower socio-economic classes. The present study covered for data collection from Santal, Oraon, Bhumij, Kora, Mahali, and Savar community. Data on age, sex, sibling, family members, family type etc was measured and recorded on a pre-test questionnaire by one-to-one interview through house to house visit. Children's age was recorded from their birth certificate. Parents were informed about the objectives of the study and their written consent was obtained. The institutional ethics committee was approved the study protocol before initiation of the study.

Sample and sample size

The tribal children were randomly selected from 16 villages under several gram panchyte of Ranibandh community development block in Bankura district using multi stage cluster sampling. A block level officer helps us to select these tribal villages of every gram panchyte, where they lived. The minimum estimated sample size (234) was calculated as per standard formula ($n = z^2pq/d^2$) (Cochran, 1963). The minimum sample size was calculated $[(1.96^2 \times 32.5 \times 67.5)/(6^2)]$ based on 32.5% prevalence of angular stomatitis (p) in the Raj Gond tribe in the central India state of Madhya Pradesh (3) with desired precision (d) of $\pm 6\%$. Where, $q = 1 - p$ and $z = 1.96$. A total of 258 (132 boys and 126 girls) children aged from 1 to 5 years were measured.

Clinical Examination and evaluation of nutritional status

For clinical examination we make a questionnaire on the basis of various previous research and advice of doctor. In the same way we create a survey manual with a picture, which helps a lot during the survey. The survey questionnaire implants related to general appearance, skin, hair, eyes, teeth, tongue, oedema, digestive tract, nausea etc indicating various nutritional deficiencies disease and communicable and non communicable disease of tribal preschool children in

Paschimanchal, West Bengal. Nutritional status or physical condition is divided into four categories based on the score of collected data these are low risk, needs monitoring, moderate risk and high risk.

Statistical analyses

Results

Clinical sing	Boys n=132 (%)	Girls n=126 (%)	Total n=258 (%)
1) Clinical Sign of General Appearance Present	102 (77.27)	105 (82.67)	207 (80.23)
2) Conjunctiva Xerosis Present	13 (9.84)	08 (6.34)	21 (8.13)
3) Conjunctiva Pigmentation Present	28 (21.21)	16 (12.69)	44 (17.05)
4) Conjunctiva Discharge Present	03 (2.27)	04 (3.17)	07 (2.71)
5) Cornea Xerosis Present	03 (2.27)	01 (0.79)	04 (1.55)
6) Angular Conjunctivitis Present	01 (0.75)	0 (0)	01 (0.38)
7) Night Blindness Present	01 (0.75)	0 (0)	01 (0.38)
8) Angular stomatitis Present	09 (6.81)	04 (3.17)	13 (5.03)
9) Pale, red and raw tongue	11 (8.33)	09 ((7.14)	20 (7.75)
10) Cheilosis present	08 (6.06)	03 (2.38)	11 (4.26)
11) Buccal Mucosa Condition with clinical sing	06 (4.54)	02 (1.58)	08 (3.10)
12) Gums Condition with clinical sing	02 (1.51)	01 (0.79)	03 (1.16)
13) Teeth Flurosis present	15 (11.36)	16 (12.69)	31 (12.01)
14) Teeth Caries present	20 (15.15)	13 (10.31)	33 (12.79)
15) Hair Condition with clinical sing	48 (36.36)	38 (30.15)	86 (33.33)
16) Skin General Appearance	42 (31.81)	47 (37.30)	91 (35.27)
17) Skin Elasticity diminished	34 (25.75)	34 (26.98)	68 (26.35)
18) Regional Trunk present	13 (9.84)	13 (10.31)	26 (10.07)
19) Face with disease symptoms	10 (7.75)	14 (11.11)	24 (9.30)
20) Adipose Tissue, Quantity losses	74 (56.06)	64 (50.79)	138 (53.48)
21) Oedema Present	15 (11.36)	10 ((7.93)	25 (9.68)
22) Bone Condition with clinical sing	23 (17.42)	20 (15.87)	40 (15.50)
23) Alimentary System, Appetite	21 (15.90)	18 (14.28)	39 (15.11)

24)	Stool with diarrhoea	06 (4.54)	04 (3.17)	10 (3.87)
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Clinical signs for difference nutritional deficiencies disease and various communicable or non communicable diseases were observed. Preschool children were examined for clinical signs of some deficiency diseases and some communicable or non communicable diseases. It is easy to see from the outside that the child has various clinical sing or physical condition is not good, the proportion of such children was 80.23% and that which boys children was 77.27% and girls children was 82.67%. Different types of eye diseases like conjunctiva xerosis, conjunctiva pigmentation, conjunctiva discharge, cornea xerosis, night blindness etc have been noticed. According to the survey data, 8.13% suffer from conjunctiva xerosis and 17.05% suffer from conjunctiva pigmentation which is much higher than other eye diseases like conjunctiva discharge (2.71%), cornea xerosis (1.55%), angular conjunctivitis and night blindness (0.38%). However, more eye disease is seen in boys than in girls.

Overall oral hygiene was poor among the preschool children of Paschimanchal in West Bengal. Different types of oral diseases such as angular stomatitis (5.03%), pale, red and raw tongue (7.75%), cheilosis (4.26%), flurosis of teeth (12.01%), caries of teeth (12.79%), gum and buccal mucosa diseases etc can be widely reported in both boys and girls of tribal preschool children of Paschimanchal in West Bengal. The overall prevalence of hair condition of clinical sing was found 33.33%, where boys preschool children was higher (36.36%) and than girls (30.15%) respectively. Another important organ for clinical symptom is skin. All skin related questions were; general appearance of skin, elasticity of skin, regional trunk and adipose tissue on skin; there in 35.27% of cases, the skin had clinical sings and in 26.35%, their skin elasticity decreased. In addition 53.48% of preschool children have low subcutaneous fat under the skin and 10.07% of children have regional trunk. Oedema is an important indicator of malnutrition, the presence of oedema in the body indicates a decrease in blood protein. In our survey report 9.68% children had oedema and 15.50% of children had bone disease. About 15.11% of the children in the region had anorexia and 3.87% had diarrhea.

Discussion

India is second only to Africa in terms of indigenous peoples living in the world. Various studies have shown that the nutritional status or health status of tribal preschool children in India is very poor (4, 5, 7, 8, 20). Their diet is high in carbohydrates such as rice, wheat, puffed rice, potato; on the other hand protein, vitamins and minerals rich food like meat, fish, milk and oil are low amount which affect their health (7, 8, 20). However, the results of their general appearance showed that about 80.35% had different clinical symptoms, which reveals the miserable state of their health. 8.13% of children in this region have symptoms of conjunctiva xerosis, 17.05% of conjunctiva pigmentation and symptoms of other eye diseases are few, which is much more than the various indigenous preschool children of Madhya Pradesh (20) and much less than the children of Mayurbhanj district of Orissa state (8), jenukuruba tribal children in Mysore district (6) and Birhor children of Raigarh district in Chattrishgarh (21). In the other hand various eye diseases of the tribal preschool children in Maldah

district was very low (9) and another study of Bankura district tribal preschool children was very high (10). Usually lack of vitamin A is responsible for various eye diseases.

Angular stomatitis and cheilosis are commonly seen in the absence of vitamin B complex. The results of our study showed that 5.03% children suffer from angular stomatitis, 7.75% pale, red and raw tongue and 4.26% of children suffer from cheilosis. However, there are more such symptoms in boys than in girls. Studies in other states like Madhya Pradesh (3), Chhattishgarh (4, 21) and Orissa (8) and in West Bengal of Maldah (9), Bankura (10), and Jhargram (11) show more deficiency of vitamin B complex in tribal preschool children than in our study. Teeth flurosis and teeth caries occur mainly due to the presence of fluoride in drinking water and excess sugar intake and infection of teeth. The rate of teeth flurosis and teeth caries in our study is 12.01% and 12.79% respectively, which is more less than the Birhor children of Chattrishgarh (21), jenukuruba tribal children in Mysore district (6), Bhumija Munda tribe of Mayurbhanj (8), Raj Gond preschool children of Madhya Pradesh (3) and tribal preschool children of Bankura district (10). Hair and skin are other important organs in which the symptoms of various diseases appear. In our study, 33.33% of the children had various hair symptoms and 35.27% of the skin. Hair condition of jenukuruba tribal children in Mysore district , Karnataka (6) is very bad than our study and similar or lesser symptoms are seen in Bankura district of West Bengal (10) and Raj Gond tribal children in Madhya Pradesh (3). On the other hand, it can be said that the skin condition of Birhor children in Chhattishgarh (21)is similar to our study and the skin condition of jenukuruba tribal children in Mysore district of Karnataka (6) is very bad than our study.

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