International Journal of Research in Medical Sciences
Somawar BN et al. Int J Res Med Sci. 2015 Oct;3(10):2820-2825
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20150690

Research Article

Assessment of nutritional status amongst bihor tribe childrens residing in Dharamjaigarh block of Raigarh district (C.G.), India

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Received: 18 September 2015
Accepted: 21 September 2015

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ABSTRACT

Background: Despite rapid economic development along with increase in food production in recent decades and several nutritional intervention programmes in operation since the last three decades, childhood under nutrition remains an important public health problem in India. The burden of under nutrition appears particularly high among rural and Indigenous tribal populations. "Birhor" tribal community of Dharamjaigarh block, Raigarh district has long remained a separate entity in terms of the demographic, health and socioeconomic characteristics. By any standard measurement of social improvement the "Birhor" tribal communities can be registered as one of the most vulnerable section of society. The social and economic backwardness has always been responsible for poor health status, high incidence of low birth weight, infant and child mortality among these groups. In India, many recent studies have been conducted on the nutritional status of preschool children and have revealed a high rate of malnutrition. With the above background, the present study was conducted to assess the nutritional status in tribal children's in the study area.
Methods: The present cross sectional study was carried out in Dharamjaigarh block of Raigarh district. The study was conducted from January 2013 to June 2014. 63 children of 0-3.5 year's age group from 148 families of 15 villages of Primitive Birhor Tribe were randomly selected where the population of Birhor tribe is more as shown in map. Pretested structured questionnaire was used to gather data from parent/head of family by door to door visit of every household Nutritional assessment was done by clinical examination and anthropometric measurement using standard equipment and procedures. As per Pretested structured proforma general information of every child was noted. Age was confirmed either by calendar of local events or from registers of aganwadi worker and recorded in complete month. Other relevant information was also noted.
Results: Out of 63 children studied Over all 16(51.6 %) of female children were malnourished when compare to 10 (31.3%) of male children. Out of total malnourished children 19 (30.2%) found moderately malnourished and 7 (11.1%) severely malnourished. Most of the cases of stunting were >1 year of age 29/38 (76.3%).Most of the cases of stunting were females (60.5%). Most of the wasting cases were above 12 months of age 9(90%), $p<0.0001$, statistically significant. Most of the wasting cases were females (60%) than males (40%).
Conclusions: Present study demonstrates that children in this tribe are at very high risk. Steps are needed to improve the same.

Keywords: Malnutrition, Tribal children, Raigarh, Chhattisgarh

INTRODUCTION

Malnutrition is identified as a major health and nutrition problem in India. It occurs particularly in weaklings and children in the first years of life. It is not only an important cause of childhood morbidity and mortality, but leads also to permanent impairment of physical and possibly, of mental growth of those who survive.[1]

Despite rapid economic development along with increase in food production in recent decades and several nutritional intervention programmes in operation since the last three decades, childhood under nutrition remains an important public health problem in India. The burden of under nutrition appears particularly high among rural and Indigenous tribal populations.[2,3]

In view of their habitat and dietary habits, they often distinguish themselves from other population groups. Their food consumption pattern is influenced by vagaries of nature and varies from extreme deprivation in lean season to high levels of intakes of several foods during post-harvest period. Geographical isolation, primitive agricultural practices socio cultural taboos, lack of formal education, poor infrastructure facilities, improper health seeking behaviour, poverty etc. leads to the development of various morbidities and under nutrition.

"Birhor" tribal community of Dharamjaigarh block, Raigarh district has long remained a separate entity in terms of the demographic, health and socioeconomic characteristics. By any standard measurement of social improvement the "Birhor" tribal communities can be registered as one of the most vulnerable section of society. The social and economic backwardness has always been responsible for poor health status, high incidence of low birth weight, infant and child mortality among these groups. In India, many recent studies have been conducted on the nutritional status of preschool children and have revealed a high rate of malnutrition (Mahapatraet al., 2000; Jose & Indira, 2000; Dubeyet al.,2003; NNMB, 2002; Mitraet al., 2004; Tiwariet al., 2005; Reddy et al., 2006).[4-10] However, in tribal areas of India, information regarding the nutritional status of preschool children of specific tribes is very scanty, although a few studies have been done in tribal preschool children in different states (Rao & Rao, 1994; Maurya & Jaya, 1997; NNMB, 2000; Choudhary, 2001; Raoet al., 2006), in Madhya Pradesh (Raoet al., 1994; NFHS, 1998-99) and among the Gonds (Raoet al., 2005) and Kodaku (Dollaet al., 2005) tribal preschool children of Central India. They have shown that tribal populations living in different ecosystems have varying degrees of nutritional status.[11-18]

But there are hardly any studies on nutritional status of preschool children among the "Birhor" tribal communities in India.

With the above background, the present study was conducted to assess the under nutrition in tribal children's in the study area.

METHODS

The present cross sectional study was carried out in Dharamjaigarh block of Raigarh district. The study was conducted from January 2013 to June 2014. 63 children of 0-3.5 year's age group from 148 families of 15 villages of Primitive Birhor Tribe were randomly selected where the population of Birhor tribe is more as shown in map. Pretested structured questionnaire was used to gather data from parent/head of family by door to door visit of every household Nutritional assessment was done by clinical examination and anthropometric measurement using standard equipment and procedures.

Inclusion criteria

All under 3.5 year children including neonates.

Exclusion criteria

Pre - term new-born, congenital anomalous child severely ill child

Ethical clearance

Taken from ethics committee, Pt. J. N. M. Medical College & associated Dr. B. R. Ambedkar Hospital Raipur. District & Block head were contacted and informed before purpose of study; parental consent was obtained for collecting the tribal children information.

Method of approach

Dharamjaigarh block is 80 Kms. from Raigarh district. In this block there are 8 primary health center and 61 sub-centres. Most of the villages are in hilly areas widely scattered from primary health centre and they become non-approachable during rainy season. Under the guidance of medical officers of Dharamjaigarh block, villages were randomly selected where population of Birhor is more.

On reaching the village either aganwadi worker or health worker or some local person was used to guide. A cross sectional survey was done by door to door visit.

As per Pretested structured proforma general information of every child was noted. Age was confirmed either by calendar of local events or from registers of aganwadi worker and recorded in complete month. Other relevant information was also noted. Complete clinical examination of every child was done as per standard protocol.

Sample size calculation

Taking ~ 50 % prevalence of malnutrition among the Birhor community.

Applying formula $4pq/L^2$

Where
p = prevalence
q = (1-p)
L = Level of error (25%)
Confidence level =95%
Considering $p<0.05$ as significance level.
The calculated sample size is 62.

Data was compiled in MS-Excel and checked for its completeness and correctness. Then it was analysed.

RESULTS

Table –1 Show that out of 63 children studied 31 (49.2%) were female and 32 (50.8%) were male. Most of the children studied belong to the age group of 13-36 months, which constitute 71% female & 60.3% male children.

Table -2 shows that out of 63 children studied Over all 16(51.6 %) of female children were malnourished when compare to 10 (31.3%) of male children. Out of total malnourished children 19 (30.2%) found moderately malnourished and 7 (11.1%) severely malnourished. Most of the moderately malnourished children 15 (78.9%), while severely malnourished 19 (73%) were belongs 10 – 36 months age group.

Table 1: Age and sex wise distribution of study subjects.

Age groups (months)	Female	%	Male	%	Total children	%
0-3	4	12.9	1	3.1	5	7.9
4-6	2	6.5	2	6.3	4	6.3
7-9	0	0.0	1	3.1	1	1.6
10-12	1	3.2	5	15.6	6	9.5
13-24	8	25.8	10	31.3	18	28.6
25-36	14	45.2	6	18.8	20	31.7
36-48	2	6.5	7	21.9	9	14.3
Total	31	100.0	32	100.0	63	100.0

Table 2: Distribution of malnutrition in Birhor children according to who classification.

Age (months)	Sex	Total Children	No of Healthy Children	%	Moderate Malnutrition	%	Severe Malnutrition	%	Total Malnutrition	%
0--3	F	4	1	25	1	25	2	50	3	75
	M	1	1	100	0	0	0	0	0	0
4--6	F	2	0	0	2	100		0	2	100
	M	2	2	100	0	0		0	0	0
7--9	F	0	0		0		0		0	
	M	1	1	100		0		0	0	0
10--12	F	1	1	100	0	0	0	0	0	0
	M	5	3	60	1	20	1	20	2	40
13--24	F	8	4	50	1	12.5	3	37.5	4	50
	M	10	4	40	5	50	1	10	6	60
25--36	F	14	7	50	7	50		0	7	50
	M	6	4	66.7	2	33.3		0	2	33.3
36-48	F	2	2	100		0		0	0	0
	M	9	9	100		0		0	0	0
Total	F	31	15	48.4	11	35.5	5	16.1	16	51.6
	M	32	22	68.8	8	25	2	6.3	10	31.3
Total		63	37	58.7	19	30.2	7	11.1	26	41.3

Table 3 Shows that out of 63 children studied 42(66.7%) were healthy 21(33.3%) were malnourished. Maximum i.e. 12(19%) belongs to grade I, 5(7.9%) grade II, 3(4.8%) grade III and only 1(1.6%) belongs to grade IV PEM. Prevalence was highest 16(76.1%) in 1-3yrs age and none found in 7-9 month and more than 3yrs of age group.

Most of the cases of stunting were >1 year of age 29/38 (76.3%) this was statistically significant (p<0.0001) (Table-4).

Most of the cases of stunting were females (60.5%) this was statistically significant (p<0.01) (Table-5).

Table 3: Distribution of Malnutrition in Birhor children according to IAP classification.

Age (months)	Sex	Total Child	No of Healthy Children	%	No of Mild Malnutrition	%	No of Moderate Malnutrition	%	No of Severe Malnutrition	%	No of Very Severe Malnutrition	%	Total Malnutrition	%
0--3	F	4	2	50	0	0	0	0	1	25	1	25	2	50
	M	1	1	100	0	0	0	0	0	0	0	0	0	0
4--6	F	2	0	0	1	50	1	50	0	0	0	0	2	100
	M	2	2	100	0	0	0	0	0	0	0	0	0	0
7--9	F	0	0		0		0		0		0		0	
	M	1	1	100	0	0	0	0	0	0	0	0	0	0
10--12	F	1	1	100	0	0	0	0	0	0	0	0	0	0
	M	5	4	80	0	0	1	20	0	0	0	0	1	20
13--24	F	8	4	50	0	0	2	25	2	25	0	0	4	50
	M	10	6	60	3	30	1	10	0	0	0	0	4	40
25--36	F	14	8	57.1	6	42.9	0	0	0	0	0	0	6	42.9
	M	6	4	66.7	2	33.3	0	0	0	0	0	0	2	33.3
36-48	F	2	2	100	0	0	0	0	0	0	0	0	0	0
	M	7	7	100	0	0	0	0	0	0	0	0	0	0
Total	F	31	17	54.8	7	22.6	3	9.7	3	9.7	1	3.2	14	45.2
	M	32	25	78.1	5	15.6	2	6.3	0	0	0	0	7	21.9
Total		63	42	66.7	12	19	5	7.9	3	4.8	1	1.6	21	33.3

Table 4: Association of stunting (WHO) with Age.

Age (months)	Healthy Children	%	Stunting	%	Tall	%	Total
0-3	2	40.0	3	60.0	0	0.0	5
4-6	1	25.0	3	75.0	0	0.0	4
7-9	0	0.0	1	100.0	0	0.0	1
10-12	4	66.7	2	33.3	0	0.0	6
13-24	4	22.2	14	77.8	0	0.0	18
25-36	5	25.0	14	70.0	1	5.0	20
37-48	8	88.9	1	11.1	0	0.0	9
Total	24	38.1	38	60.3	1	1.6	63

Table 5: Association of stunting (WHO) with Sex.

Sex	Normal	%	Stunting	%	Tall	%	Total
Female	7	22.6	23	74.2	1	3.2	31
Male	17	53.1	15	46.9	0	0.0	32
Total	24	38.1	38	60.3	1	1.6	63

Most of the wasting cases were above 12 months of age 9 (90%), p<0.0001, statistically significant (Table-6). Most of the wasting cases were females (60%) than males (40%) but this difference is statistically not significant (Table-7).

Table 6: Association of wasting (WHO) with Age.

Age in months	Normal	%	Over Wt.	%	Wasting	%	Total
0-3	4	80.0	0	0.0	1	20.0	5
4-6	3	75.0	1	25	0	0.0	4
7-9	1	100.0	0	0.0	0	0.0	1
10-12	6	100.0	0	0.0	0	0.0	6
13-24	13	72.2	1	5.6	4	22.2	18
25-36	15	75.0	0	0.0	5	25.0	20
37-48	9	100.0	0	0.0	0	0.0	9
Total	51	81.0	2	3.2	10	15.9	63

Table 7: Association of wasting (WHO) with Sex.

Sex	Normal	%	Over Wt.	%	Wasting	%	Total
Female	25	80.6	0	0.0	6	19.4	31
Male	26	81.3	2	6.3	4	12.5	32
Total	51	81.0	2	3.2	10	15.9	63

DISCUSSION

In this study, among 63 children, 32 (50.79%) were males and 31 (49.2%) children were females. Among 63

children 7.93% belong to 0-3 months age group, 6.34%, 1.58%, 9.52%, 28.57%, 31.74% and 14.28% belong to 4-6, 7-9, 10-12, 13-24, 25-36 & 36-48 months of age group respectively and male/ female ratio is 1.03. Stunting cases were significantly associated with age & sex, whereas wasting cases were significantly associated with age.

Values related to malnutrition were similar as compared to study done by Kumar et al (2006) in aganwadi Children of Allahabad on 217 pre-school children observed.[19]

Similar result found in NFHS-3 (2005-06) with under nutrition among the rural children but stunting was found higher in present study and wasting was on lower side.[20]

In present study higher percentage of stunting and lower percentage of wasting may be due to their racial short stature.

Table 8: Different studies reflecting prevalence of PEM according to IAP classification.

Authors [21-25]	Place	Sample	Healthy	Malnutrition Grading [%]				Total %
				I	II	III	IV	
B. Bhandari et al	Kherwara, Rajasthan	834	36.09	31.41	22.42	8.39	1.67	63.91
	Kherwara, Rajasthan	897	44.7	24.3	21.96	6.46	1.56	55.29
M.M. Shrivastava	Mandla	200	44.5	45.5	9.5	0.5	–	55.29
P. Khapekar	Gariaband	234	19.23	33.76	35.04	10.68	1.28	80.7
Y. Verma	Chhura Block	456	27.38	32	28	10.5	1.5	72.14
S. Azad	Wadraf Nagar	449	17.8	18.7	42	20.4	0.89	82.1
Present Study	Bagicha Block	192	9.3	32.8	48.7	7.8	1.5	90.6

When compared with above studies, overall prevalence of PEM was lower in present study, while similar for severe malnutrition. This tribal is in general healthier than the other primitive tribes.

Present study revealed that difference in prevalence of PEM for both sexes were statistically not significant. Similarly trend was observed by Chirumulay et al and Khapekar.[26,27]

CONCLUSION

Present study demonstrates that children in this tribe are at very high risk. Steps are needed to improve socio-economic conditions by income generating activities such as an employment guarantee scheme, food for work programme etc. for food security along with increased dietary intake of calories and proteins, improved maternal education along with maternal health promotion, improved sanitation and provision of safe drinking water for prevention of diarrhoeal and other infections. Finding of the present study will be useful for programme managers in priority setting and resource allocation in the study area.

ACKNOWLEDGEMENT

The authors are thankful to all the faculty and technical staff of department of Paediatrics, Dr. BRAM Hospital, Pt. J. N. M. medical college, Raipur (C.G.) India, for their cooperation and support during the entire study period.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Somawar BN, Phuljhale S. Assessment of nutritional status amongst bihor tribe childrens residing in Dharamjaigarh block of Raigarh district (C.G.), India. Int J Res Med Sci 2015;3:2820-5.