

Protein Energy Malnutrition in Urban Slums of Raipur City

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Abstract: **Objective:** To study Protein energy malnutrition in 0-5 year. Age group in urban slums of Raipur city.
Methods: Retrospective, cross-sectional observational study of 818 children of 0-5 yr. age group in various slums of Raipur city.

Period of study: 1 year (January 2010-January 2011)

Results: Out of 818 children in 0-5 year age group 411 were of 0-2 month age group. In which 50.2% were found to be FTT (Failure To Thrive) while 49.8% were normal according to IAP classification.

In rest 407 children; 229 male and 178 were female in age group to 2month-5 year. Among 229 male children maximum 41.0% were Grade I PEM followed by 30.1% Grade II, 11.8% Grade III and 7.8% Grade IV PEM, while only 9.2% were normal. Among 178 female children maximum 44.9% were in Grade I PEM, 34.8% in Grade II, 7.3% in Grade III and 3.4% in Grade4 PEM, while only 9.6% were found to be normal according to IAP classification of malnutrition.

Conclusions: In urban slums of Raipur city protein energy malnutrition in 0-5 year age group starts early and worsens as the child grows.

Key words: Urban slums, Raipur city, Protein energy malnutrition, IAP classification of malnutrition.

1. INTRODUCTION

The urban population is rapidly expanding because of large-scale migration to cities for a possible better life. A large proportion of this migrating population ends up residing in slums in inhuman conditions. As a result urban poverty and hunger are increasing in many developing countries.

Malnutrition in young children has long-term negative effects on physical and cognitive development. Addressing nutritional problems of urban poor is therefore must for overall development of the country. As Protein Energy Malnutrition is the major nutritional problem; this study focuses on the current scenario in relation to the nutritional status of children of urban slums.

Chhattisgarh is one of the youngest State of the Indian nation constituted on 1st Nov 2000. Total population of the state according to 2001 census is 2.08 crore; of this 80% is rural and 20% is urban. Raipur and Durg account for almost half the total urban population of Chhattisgarh¹.

As the NFHS-3 data² suggest that in urban areas of Chhattisgarh more than one third (39%) of children suffer from chronic undernutrition. Girls and boys are almost equally likely to be undernourished.

There is scarcity of data from urban slums, that's why such studies are much needed.

2. METHODS

This study was conducted over a period of 1 Year at the Aanganwadi Centers of various urban slums of Raipur city. For this purpose 818 children of 0-5 year age group were randomly selected.

INCLUSION CRITERIA: All term neonates, infants and children up to 5 year of age who reside permanently in slums of Raipur city.

EXCLUSION CRITERIA: Children >5 year or preterm or sick newborn who needed admission in nursery within 7 days after birth or 0-5 year children of guests and relatives from other places.

Mothers were initially explained the aims and objectives and type of study and they were taken into confidence. With the help of Aangan Wadi Workers (AWWs) mothers were collected twice weekly at the Aangan Wadi Centers (AWC) nearby, where one of the days was weekly vaccination day. Pre-conceived and printed questionnaire was used as proforma and filled by the investigator herself based on Mothers interview and nutritional anthropometry (done by investigator herself). Weight was recorded by electronic weighing machine, with correction of zero error. Height was measured by infantometer for infants and wall-mounted vertical scale for older children. Data was collected, tabulated and analysed statistically. As this is a one-time, single observation study, Confidence Interval (CI) was chosen as the best tool to gather reliable data; narrower the range, more the confidence in the data. The calculation of 95% confidence interval was done by method described by J.E.Park³.

95% confidence interval (CI): It is the range of 95% confidence in any data.

To calculate CI, SEP (standard error of proportion) is calculated as follows:

$$SEP = \sqrt{(pq/n)}$$

Where

p= proportion of the parameter for which 95% CI is to be calculated.

q=proportion of the rest of the parameters.

n= sample size.

$$95\% \text{ CI} = SEP \times 1.96 \pm p$$

i.e. $(SEP \times 1.96 \text{ CI}) + p$ to $(SEP \times 1.96 \text{ CI}) - p$

95% CI calculated for every parameter.

TABLE 1:- AGE GROUP 0-2 MONTHS: DISTRIBUTION OF SUBJECTS ACCORDING TO NUTRITIONAL STATUS: (IAP CLASSIFICATION OF MALNUTRITION)

Nutritional Status	No.	%	95% CI
Normal	205	49.8	(CI-0.45-0.54)
FTT	206	50.2	(CI-0.45-0.54)
Total	411	100	

FTT-Failure To Thrive; CI-Confidence Interval

50.2% were found to be FTT (95% CI- 0.45-0.54)

TABLE 2:- AGE GROUP >2 MONTH TO 5 YEARS: DISTRIBUTION OF MALE SUBJECTS ACCORDING TO NUTRITIONAL STATUS (IAP CLASSIFICATION OF MALNUTRITION)

Nutritional Status	Age (In Years)											95% CI	
	1		2		3		4		5		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.		%
Normal	4	10.8	3	7.1	6	9.5	5	9.4	3	8.8	21	9.2	(0.06-0.12)
Grade I PEM	15	40.5	17	40.5	25	39.7	21	39.6	14	41.2	94	41	(0.036-0.45)
Grade II PEM	10	27	14	33.3	19	30.2	16	30.2	10	29.4	69	30.1	(0.25-0.34)
Grade III PEM	5	13.5	4	9.5	7	11.1	7	13.2	4	11.8	27	11.8	(0.08-0.15)
Grade IV PEM	3	8.1	4	9.5	6	9.5	2	3.8	3	8.8	18	7.8	(0.05-0.10)
Total	37	100	42	100	63	100	53	100	34	100	229	100	

PEM-Protein Energy Malnutrition; CI-Confidence Interval

Majority (41%) of the male subjects were found to be in Grade I PEM (95%CI-0.36-0.45) followed by Grade II, Grade III, Normal and Grade IV PEM.

TABLE 3:-AGE GROUP >2 MONTH TO 5 YEAR: DISTRIBUTION OF FEMALE SUBJECTS ACCORDING TO NUTRITIONAL STATUS (IAP CLASSIFICATION OF MALNUTRITION)

Nutritional Status	Age (In Years)												95% CI
	1		2		3		4		5		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Normal	3	10	3	7.9	7	13.2	2	9.5	2	5.6	17	9.6	(0.07-0.12)
Grade I PEM	15	50	21	55.3	24	45.3	8	38.1	14	38.4	80	44.9	(0.39-0.48)
Grade II PEM	9	30	11	32.4	17	32.1	7	33.3	18	50	62	34.8	(0.29-0.38)
Grade III PEM	2	6.7	4	10.5	3	5.6	3	14.3	1	2.8	13	7.3	(0.47-0.09)
Grade IV PEM	1	3.3	1	2.6	2	3.8	1	4.8	1	2.8	6	3.4	(0.02-0.05)
Total	30	100	38	100	53	100	21	100	36	100	178	100	

Majority (44.9%) of the female subjects were found to be in Grade I PEM (95%CI-0.39-0.48) followed by Grade II, Grade III, Normal and Grade IV PEM.

3. RESULTS

In 0-2 month age group 50.2% were found to be FTT according to IAP classification (95% CI 0.45-0.54).

In > 2 month to 5 years age group malnutrishment is prevalent with 41% male Subjects in Grade I PEM according to IAP classification (95% CI-0.36-0.45), followed by 30.1%(95% CI-0.25-0.34) in Grade II, 11.8%(95% CI-0.08-0.15) in Grade III and 7.8%(95% CI-0.05-0.10) in Grade IV PEM; while only 9.2%(95% CI-0.06-0.12)male subjects were found to be normal in anthropometry.

In female subjects maximum 44.9% were in Grade I PEM (95% CI-0.39-0.48).followed by 34.8%(95% CI-0.29-0.38) in Grade II, 7.3%(95% CI-0.47-0.09) in Grade III, 3.4%(95% CI-0.02-0.05) in Grade IV PEM; while only 9.6%(95% CI-0.07-0.12)female subjects were found to be normal in anthropometry.

4. DISCUSSION

In 0-2 month age group 50.2% were found to be FTT and 49.8% were normal.

In > 2 month to 5 year age group majority of female children were in Grade I PEM (44.9%) followed by Grade II PEM(34.8%), Grade III (7.3%) and Grade IV (3.4%). In females subjects malnutrition worsened after 1 year of age with deterioration in PEM gradings.This trend focuses on gender bias in feeding of children

In >2 month to 5 year age group maximum(41%)male children were in Grade I PEM followed by Grade II (30.1%), Grade III (11.8%) and Grade IV (7.8%) no significant difference as age increases. This trend focuses on lack of nutritional feeding.

Nutrition foundation of India, New Delhi in 1989 conducted a study in urban slums of Calcutta ⁴ on “Profiles of under nutrition and under-development: studies of poor communities in seven regions of the country” found that out of 601 underfive children 40% were in Grade I, 44% in Grade II and 9% in Grade III PEM Total 93% were underweight These findings are more than our study.

Nandini Saxsena et al⁵ (1996) in a study on “Prevalence of underweight, stunting and wasting” with total 630 under six children, found out that 37.3% were in Grade I and 20.3% were in Grade II PEM. These findings are less than our study.

Awasthi S. et al⁶ (1997) conducted study on “Prevalence of malnutrition and intestinal parasites in preschool slums children in Lucknow” with 1061 children found that 68% were underweight 63% were stunted 26% were wasted. These findings are similar to our study.

B. Aneja et al⁷ (2000) from department of human nutrition in 2 urban slums communities of Delhi with 155 children found that 11% had Grade I PEM, 9% Grade II PEM, 2% Grade III and 4% Grade IV PEM. These findings are less than our study.

Deeksha Kapur et al⁸ (2004) conducted study on “Dietary intake and growth pattern of children 9-36 month of age in urban slums in Delhi” study was conducted with 545 children found that in males subjects 37.3% had Grade I PEM, 32.3%, Grade II PEM and 6.5% were in Grade III and 4 PEM.

In females subjects 40% had Grade I PEM, 28.6%, Grade II PEM and 9.6 % were in Grade III and 4 PEM. These findings are similar to our study.

Poor child feeding practices adopted may largely explain the low nutrient intake, recorded in the present study. As the NFHS-3 findings¹ confirmed, prolonged breastfeeding, late introduction to complimentary feeding, high reliance on diluted top milk, and delay in putting the child on to the family food may have contributed to our findings.

The Prevalence of moderate to severe forms of malnutrition was found to be consistently higher during the second/third year of life. Children under three years of age are more vulnerable and at risk of developing malnutrition, and they tend to respond more to intervention than older children.

5. CONCLUSION

We conclude that poverty, illiteracy, poor housing conditions, harmful child rearing practices and poor health care delivery system are the main reason for rampant protein energy malnutrition among under-fives of urban slums of Raipur city.

Malnourished girl child grows up to be a malnourished mother and gives birth to low birth weight baby and vicious cycle goes on. IEC (Information, Education and Communication) activities must be targeted to educate the mother in slums area.

There is an urgent need to provide adequate infrastructure to alleviate poverty and illiteracy, which will ultimately improve the health status of slum children.

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WHAT IS ALREADY KNOWN?

Health conditions are poor in urban slums.

WHAT THIS STUDY ADDS?

Most of the children in urban slums suffer from Protein energy malnutrition which starts from a very early age and worsens as the age of child progresses.

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