Original Article ▌

MORBIDITY PROFILE IN UNDER FIVE CHILDREN IN URBAN SLUM AREA OF NAGPUR

Narkhede Vinod[1], Sinha Umesh[2], Bhardwaj Sumit D[2], Pitale Smita[3]

Author's Affiliation:
[1]Associate Professor, [2]Assistant Professor, Department of Community Medicine, CMCH, Bhopal, [3]Professor, Department of Community Medicine, KPSIMS & RC, Nagpur

Correspondence:
Dr. Vinod Narkhede,
Email: Drvinod72@rediffmail.com

ABSTRACT

Introduction: Childhood diseases like diarrhoea, respiratory infections, measles, etc are very common in India. It is known that a child may get affected several times in a year; the incidence increases with the aggravation of a state of malnutrition.

Aim: The study was aimed to assess the malnutrition and morbidity profile in underfive children in urban slum area of Nagpur.

Material & Methods: A house-to-house survey was conducted. By systematic random sampling 434 children below five years of age were included in the study. Every attempt was made to cover maximum number of children by giving 3 visits to them. Total 404 children were covered in the study. The information obtained from child's mother was filled in the proforma. Every child was subjected to thorough clinical examination in daylight, and anthropometric measurements. Hemoglobin estimation was done by using Sahli's haemoglobinometer and peripheral smear was prepared. Data was analyzed on Epi-Info Software 3.2 version. Chi square test is used to test the significance.

Result: It was observed that highest prevalence of morbidity was of anaemia (78.71 percent), most of them were nutritional: followed by protein energy malnutrition (IAP classification) was 52.23 percent, vitamin B deficiency (46.53 percent), disease of respiratory system 32.19 percent).

Conclusion: More than three-quarter of children from urban slum were suffering from anaemia and had high burden of under nutrition. Large proportion of morbidities in the under 5 children could be attributed to the nutritional status.

Key Words: morbidity, under five children, malnutrition, slum area, ICD 10 code

INTRODUCTION

Malnutrition is a silent emergency.[1] Malnutrition is frequently part of a vicious cycle that includes poverty and disease. These three factors are interlinked in such a way that each contributes to the presence and permanence of the others. Socioeconomic and political changes that improve health and nutrition can break the cycle; as can specific nutrition and health interventions.

The health and social consequences of the current high prevalence of impaired child growth in developing countries are severe. The major outcomes of malnutrition during

childhood may be classified in terms of morbidity, mortality, and psychological and intellectual development; there are also important consequences in adult life in terms of body size, work and reproductive performances, and risk of chronic diseases.

Several authors have examined the association between anthropometry and morbidity. The leading childhood diseases are diarrhoea, respiratory infections, measles, tuberculosis etc. It is known that a child may get affected several times in a year; the incidence increases with the aggravation of a state of malnutrition.[2]

A number of studies carried out during emergency and non-emergency situations have demonstrated the association between increased mortality and increasing severity of anthropometric deficits. Data from six longitudinal studies on the association between anthropometric status and mortality of children aged 6-59 months revealed a strong association between the severity of weight-for-age deficits and mortality rates. Indeed, out of the 11.6 million deaths among under-five children in 1995 in developing countries, it has been estimated that 6.3 million—or 54% of young child mortality—were associated with malnutrition, the majority of which is due to the potentiating effect of mild-to-moderate malnutrition as opposed to severe malnutrition.[3]

MATERIALS AND METHODS

Study area

The present community based cross-sectional study was conducted in children below five years of age from Urban health centre, Jaitala, Nagpur under the administrative control of Department of Preventive and Social Medicine, NKP Salve Institute of Medical Sciences and Research Centre, Nagpur. Duration of the study was from April 2005 to July 2006.The total population of the area was 16042.

Study subjects

Study subjects consisted of children below five years of age. Total 1827 children were registered in 0-5 years age group. A list of household was prepared having the study subjects and 434 children's were included in the study.

Sample size

The optimal sample size of 434 study subjects was calculated on the basis of 48% prevalence of undernourished children found in pilot survey.

$n = 4pq/L^2$ where p = positive character, q = 100-p

L= allowable error 10% of 'p'

METHODOLOGY

A house-to-house survey was done. By systematic random sampling 434 children below five years of age were included in the study. Every attempt was made to cover maximum number of children by giving 3 visits to them. Total 404 children were covered in the study. The information obtained from child's mother was filled in the proforma. Every child was subjected to thorough clinical examination in daylight, and anthropometric measurements. Haemoglobin estimation was done by using Sahli's haemoglobinometer and peripheral smear was prepared. Classification of morbidity was done according to International Classification of Diseases 09[4]

Anthropometry

Anthropometric measurements taken were weight, height, as per following technique.

Weight

Weight of children aged less than 2 years was measured using children weighing machine while for children more than 2 years, adult weighing machine was used. The machine was regularly checked. Method employed for weighing was near accuracy of 100grams.

Height & Length

Height was measured by making child, after removing the shoes, to stand on a flat surface with feet parallel and with heels, buttocks, shoulders and back of head touching upright the wall. The head were held comfortably erect, with the lower border of the orbit in the same horizontal plane as the external auditory meatus. The arms were made to hang at sides in natural manner. Measurement was done with the help of fibre glass measuring tape.

For infants and children below five years of age, who could not stand, length was measured by making child laid on flat surface, head positioned firmly against the fixed hardboard, with the eyes looking vertically. The knees extended, by applying firm pressure and feet are

flexed at right angles to the lower legs on the board. Length was measured between the two boards to the nearest accuracy 0.1cm.

The nutrition status was classified based on IAP classification.[5]

Investigation

Haemoglobin estimation was done by using Sahli's haemoglobinometer. Peripheral smear examination for typing of anaemia and parasite detection was done at Preventive and Social Medicine department.

Statistical Analysis

Data was analyzed on Epi-Info Software 3.2 version. Chi square test is used to test the significance.

RESULT

Four hundred and four under five children residing in urban slum of Jaitala, Nagpur were studied for the assessment of their nutritional status from April 2005 to July 2006. It was observed that out of 404 children studied 206 (51.0 percent) were males and 198 (49.0 percent) were females.

Majority of children belong to 0-12 months age group (32.1 percent),

Table 1: Distribution of children according to Age and nutritional status (I.A.P. Classification) (n=404)

Age Group In months	Nutritional Status (%) Normal	Malnourished	Total (%)
0-12	86 (66.2)	44 (33.8)	130 (100)
13-24	33 (37.1)	56 (62.9)	89 (100)
25-36	28 (46.7)	42 (70.0)	60 (100)
37-48	25 (42.4)	34 (57.6)	59 (100)
49-60	21 (31.8)	35 (53.0)	66 (100)
Total	193 (47.8)	211 (52.2)	404 (100)

($\chi 2$ =25.96, df=1, p<0.0001).

As per table no.1, age group wise prevalence of under nutrition was highest in 25-36 months age group (70 percent). On comparing prevalence of under nutrition in 0-12 months age group with 13-60 months age group (age groups merged to make 2 by 2 table) groups it was observed that former group had a better nutritional status as compared to later group. The difference was statistically significant ($\chi 2$ =25.96, df=1, p<0.0001).

Table 2: Distribution of Children according to Morbidity Pattern (as per International Classification of Diseases 09) (n=404)

Morbid Condition	I.C.D. code	Children (%)
No Morbidity		63 (15.59)
Infection and parasitic disease (A00-B99)		
Loose motion	A08	46 (11.39)
Scabies	B86	32 (7.92)
Measles	B05	3 (0.74)
Malaria	B51	2 (0.5)
Tuberculosis	A15	1 (0.25)
Typhoid	A01	1 (0.25)
Herpes zoster	B02	1 (0.25)
Disease of blood and blood forming organs (D50-D89)		
Anaemia	D50	301 (77.78)*
Sickle cell disease	D57	2 (0.5)
Endocrine, nutritional and metabolic disease (E00-E99)		
Protein energy malnutrition	E44	211 (52.23)
Vitamin B deficiency	E53	188 (46.53)
Vitamin A deficiency	E50	63 (15.59)
Vitamin D deficiency	E55	11 (2.72)
Mental and behavioral disorder (F00-F99)		
Mental retardation	F71	1 (0.25)
Disease of eye and adnexa (H00-H59)		
Conjunctivitis	H10	18 (4.46)
Stye	H01	8 (1.98)
Squint	H50	2 (0.5)
Refractive Error	H52	1 (0.25)
Disease of ear and mastoid process (H60-H95)		
Otitis media	H66	32 (7.92)
Disease of respiratory system (J00-J99€)		
Acute Respiratory Infection	J06	86 (21.29)
Acute Nasopharyngitis	J00	28 (6.93)
Acute Tonsillitis	J03	14 (3.47)
Pneumonia	J18	2 (0.5)
Disease of digestive system (K00-K93)		
Caries	K02	64 (15.84)
Stomatitis	K12	18 (4.46)
Disease of skin and subcutaneous Tissue (L00-L99)		
Carbuncle/Furuncle	L02	58 (14.36)
Disorder of genitourinary system (N00-N99)		
Phimosis	N47	1 (0.25)
Congenital malformations (Q00-Q99)		
Undescended testis	Q53	1 (0.25)
Cleft Lip	Q36	1 (0.25)

* Anaemia was assessed in 387 children.

As per table no. 2, it was observed that highest prevalence of morbidity was of anaemia (78.71 percent), most of them were nutritional: followed by protein energy malnutrition (52.23

percent), vitamin B deficiency (46.53 percent), and disease of respiratory system 32.19 percent).

As per table No. 3, it was observed that prevalence of under nutrition was higher among children having acute respiratory infection (61.97 percent); followed by diarrhea (57.14 percent), other illness (55.0 percent) and measles (54.55 percent) in past six months. The association was found significant when children with past illness were compared to children without past illness i.e no illness ($\chi2 = 4.35$, df = 1, p< 0.05) [past illness compared with no illness]

Table 3: Association of Past Illness and Nutritional Status (n = 404)

Past Illness	Nutritional Status (%)		Total (%)
	Normal	**Malnourished**	
ARI	27 (38.03)	44 (61.97)	71 (100)
Measals	05 (45.45)	06 (54.55)	11 (100)
Diarrhoea	21 (42.86)	28 (57.14)	49 (100)
Any Other	09 (45.00)	11 (55.00)	20 (100)
No Illness	131 (51.78)	122 (48.22)	253 (100)
Total	**193 (47.77)**	**211 (52.23)**	**404 (100)**

($\chi2 = 4.35$, df = 1, p< 0.05)

Table 4: Association of Anaemia and Nutritional Status (n = 404)

Nutritional Status	Type of Anaemia (%)		Total (%)
	No Anaemia	**Anaemia**	
Normal	84 (47.73)	92 (52.27)	176 (100)
Malnourished	2 (0.95)	209 (99.05)	211 (100)
Total	**86 (22.22)**	**301 (77.78)**	**387 (100)**

($\chi2 = 121.49$, df = 1, p< 0.0001)

As per table No. 4 it was observed that prevalence of anaemia was higher among children having under nutrition (99.05 percent) and prevalence of anaemia was 52.27 percent among normal children. The association of nutritional status was found significant when children with anaemia were compared to children without anaemia ($\chi2 = 121.49$, df = 1, p< 0.0001)

DISCUSSION

Under nutrition was found to be widely prevalent among the under 5 children of the urban slum area of Nagpur. More than 50 percent children were malnourished. Higher prevalence of under nutrition, probably indicating faulty weaning practices and dietary habits, was also observed by Banerjee B[6]. Under nutrition is a very complex entity. Purchasing power, socio-economic factors, cultural factors, urban rural settings and many similar factors plays role in its aetiology.

Morbidities like anaemia, under nutrition, respiratory diseases, various vitamin deficiencies among under five children in the present study was very common. Similar findings have been reported in NFHS-2[7] and studies by Chandrashekhar U and George B[8] and Sachithananthan V, Chandrashekhar U[9]. Major morbidity was nutritional may be due to low purchasing power of the families as most of the families had per capita income less than Rs 900. Under nutrition is a well-known contributory factor to high mortality in children due to infectious diseases. High infant mortality and under five mortality rates among schedule tribes of Madhya Pradesh have been observed. Though the cause of high rate of childhood mortality were not studied, high prevalence of reparatory tract infections and micronutrient deficiency disorder such as anaemia and vitamin A deficiency might be playing an important role. Poor environmental sanitation and unhygienic personal habits appear to predispose them to the risk of infection. In addition to the infection, adverse culture practice relating to child rearing, breast feeding and weaning were some other contributory factors for malnutrition and must be playing an important role in this community. Similar finding has been reported by Dwivedi SN et al[10] and Ray SK et al[11]

Jain S et al (2000)[12]reported the prevalence of anaemia in children of age 1-2 years in urban slums of Meerut observed that prevalence of anaemia was found to be significantly higher in children having low nutritional status (84.3 percent) as compared to normal nutritional status (52.9 percent). Past history of illness play an important role in the nutritional status of children.

The present study revealed the widespread prevalence of under nutrition among the under five children of this urban slum community. Analysis of pooled data obtained from several studies has shown that children with mild to moderate malnutrition have a relative risk of 2.2 for death under five years of age and children with severe malnutrition have a relative risk of 6.8.[13] Also the population attributable risk for

death due to potentiating effect of malnutrition on infectious diseases varies from percentage of children, with weight for age less than 80 per cent of the reference point , following relation[14] and 21 per cent of all death occurring among under fives is attributable to malnutrition.[15]

The problem of under nutrition amongst under five children needs to be addressed through comprehensive preventive, promotive and curative measure. The community needs to be educated about environmental sanitation and personal hygienic practices, and also proper child rearing, breast feeding and weaning practices.

CONCLUSIONS

A child who is growing well is likely to have healthy immunological defenses against infection. Healthy growth thus means decreased risk of severe infections, case fatality rates, and child mortality. In effect, a focus on the quality of life will lead to lower infant and child mortality rates and extend the gains made by child survival programmes.

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