

Morbidity Profile of Under-five Children residing in Rural Area of North Karnataka

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Abstract

Context: Children under five years of age constitute approximately 15% of the country's total population and are the most vulnerable section of the society and suffer from highest morbidity. The major diseases affecting this age group are mostly acute diarrheal diseases, acute respiratory infections, anaemia, skin infections, ear discharge, eye infections etc.

Aims: To find the morbidity profile of under-five children in a rural area and also to find out the association between nutritional status and morbidity.

Settings and Design: Cross sectional study.

Methods and Material: This study was carried out from January – December 2011 in Primary health centre, Handignur, Belgaum among children between 1-5 years of age who were selected by using simple random sampling method. Totally 933 children were included in the study. Every child was subjected to thorough clinical examination and anthropometric measurements in the anganwadi.

Statistical analysis used: Chi-square test was used for testing association between morbidity and nutritional status.

Results: In the present study, 933 children in the age group of 1-5 years were studied for the assessment of morbidity pattern. Among these, 48.55% were males and 51.45% were females. Nutritional status of children assessed by WHO classification showed that 21.9% were wasted, 32.3% were underweight and 34.1% were stunted. Acute respiratory infections were the most commonly reported morbidity (15.9%) in the past 15 days, followed by fever (4.9%). Acute Gastroenteritis was reported in 3.5% of children and eye, ENT and skin together contributed 3.6%.

Conclusions: Acute respiratory infections and diarrheal diseases were common among under five children though Govt. of India has made sincere efforts to improve the overall health of under-five children using a multi- pronged approach under NRHM.

Keywords: Morbidity profile; Under-five children; Rural area

Introduction

Children under five years of age constitute approximately 15% of the country's total population and are the most vulnerable section of the society and suffer from highest morbidity. First few years of life is the most crucial period

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of life as this age is known for accelerated growth and development, warranting regular monitoring. During this period about 40% of physical growth and 80% of mental development occurs. Any adverse influences during this period may result in severe limitations in their development. This age group is most affected by various common and easily treatable illnesses.

Three in four episodes of childhood illness are caused by one of these conditions-acute respiratory infections (mostly pneumonia), diarrhea, measles, malaria, malnutrition or a combination of these conditions. Among these malnutrition is the most common underlying cause for all other morbidities. Malnutrition is a silent emergency. 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.[1]

The other major diseases affecting this age group are mostly anaemia, skin infections, ear discharge, eye infections, traumatic injuries etc. The attributes that can be associated with these diseases are mostly overcrowding, poor sanitation, lack of basic amenities, lack of awareness about proper child care among parents of these children.

A number of child survival strategies implemented by GOI has resulted in impressive improvement in morbidity and mortality indicators but the results have not been consistent. The pace of improvement is expected to accelerate further upon full implementation of activities under NRHM (National Rural

Health Mission)[2]. The assessment of health status of under five or pre-school children reflects the health condition of a nation. It also helps in obtaining base line data for planning, interventions, follow up and evaluation of health services, provided to these children. Keeping in view the above facts, this cross sectional study was carried out with following objectives:

1. To find the morbidity profile of under five children in rural area
2. To find out the association between nutritional status and morbidity.

Materials and Methods

Study area

The present community based cross-sectional study was conducted in children between 1-5 years of age from Primary health centre, Handignur, Belgaum which is a rural field practice area of Department of Community Medicine, Jawaharlal Nehru Medical college, Belgaum. Duration of the study was from January 2011 to December 2011. The total population of the area was 33,600.

Study subjects

Study subjects consisted of children aged between 1-5 years residing in four sub-centres of Handignur Primary health centre. Total 2097 children aged between 1-5 years were registered in anganwadi. Sampling frame was prepared and 933 children were selected and included in the study.

Sample size

The optimal sample size of 933 study subjects was calculated on the basis of 30% prevalence of under-nutrition which was one of the most common morbidity noted in under-five children.

$$n = 4pq/d^2$$

where p = prevalence, q = 100-p, d = allowable error 10% of 'p'

Methodology

Totally 2097 children aged between 1-5 years were registered in anganwadi. Sampling frame was prepared and by using simple random sampling 933 children were selected and included in the study. A attempt was made to cover maximum number of selected children by giving 3 visits to their house. 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 in the anganwadi.

Anthropometry

Anthropometric measurements[3] taken were weight, height, mid-arm circumference by following techniques.

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 100 grams.

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 0.1 cm.

The nutrition status was classified based on WHO classification.[4]

Morbidity Assessment

Morbidity was also assessed along with anthropometric measurements, for recent illness in last 15 days prior to the visit using a proforma describing symptoms of common childhood illnesses. The illnesses were grouped according to the system. Thus, vomiting, diarrhea, dysentery, stomach-ache, etc. were considered as gastrointestinal (GI) ailment. Similarly, cold, cough, otitis media, breathlessness, etc. were considered as respiratory (RTI) ailment. Fever, Eye, ENT, skin was considered separately and other conditions such as congenital anomalies were categorized as others. Proportion of ill children in each age group offered the estimates of prevalences.

Clinical Assessment

A detailed proforma was prepared for clinical assessment of individual child at the time of anthropometric measurements. This included examination of head, eyes, oral cavity, skin, edema, signs for vitamin deficiency, anemia and systemic examination. Anemia was assessed clinically by examination of eyes and nails.

Informed consent was obtained from institutional ethical committee.

Consent of all the mothers of those children included in the study was taken.

Statistical Analysis

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

Results

In the present study, 933 children in the age group of 1-5 years were studied for the

Table 1: Distribution of children according to Age and Sex

S.No	Age(in months)	Males		Females		Total	
		No.	%	No.	%	No.	%
1.	12-23	105	50.00	105	50.00	210	22.5
2.	24-35	115	45.24	122	45.24	237	25.4
3.	36-47	111	51.15	106	48.85	217	23.3
4.	48-60	122	45.35	147	54.65	269	28.8
Total		453	48.55	480	51.45	933	100

assessment of morbidity pattern. Among these, 48.55% were males and 51.45% were females. With regards to age distribution it was observed that in 12-23 months age group, male and female children were represented equally with 50% each. (Fig 1) In 36-47 month age group males were more than females whereas in 24-35 and 48-60 age groups females were more than males.

All children belonged to Hindu religion.

In context to the literacy status of parents, 13% of fathers and 14.3% were illiterates. Among the literate fathers, it was observed that 26.3% had primary education, 41.2% had completed high school/secondary education, 17.3% had post SSLC education and 2.4% had completed their graduation. Among mother, 34% had primary education, 45.7% had secondary education, 5.3% had undergone post SSLC/ Diploma education and only 0.9% had completed graduation.

Majority of father's were farmers by occupation (45.1%) and mothers were housewives (55.9%). With regards to socio-economic status, majority of children belonged to Class IV (32.2%) and Class V (30%). (Fig 2)

Nutritional status of children assessed by WHO classification showed that 21.9% were wasted, 32.3% were underweight and 34.1% were stunted (Fig 2).

Acute respiratory infections was the most commonly reported morbidity (15.9%) followed by fever (4.9%). Acute Gastroenteritis was reported in 3.5% of children and eye, ENT and skin together contributed 3.6% (Fig 3).

Morbidities noted on clinical assessment were anaemia (10.9%), caries teeth (10.3%), URTI (8.6%) and pyoderma (6%). (Fig 4). Skin infections and injuries were commonly seen in children between 1-3 years whereas anaemia and caries teeth were common morbidities in children aged 4 -5 years.

When mothers were enquired about child's past illness requiring hospitalization, it was found that 83.2% did not suffer from any major illness. Among the rest (16.8%) who underwent hospitalization, the most common morbidity noticed was acute GE (4%), ARI (3.8%), fever (3.3%) and febrile convulsions (2%).

However, it was noted that past illness and history of hospitalization was not significantly associated with the nutritional status of the child ($p > 0.05$). But present morbidity over the past 15 days was significantly associated with wasting and underweight (with $p = 0.001$ and 0.002 respectively). Stunting was more in children who had a birth weight of less than 2.5 kg ($p < 0.05$).

Table 2: Distribution of children according to nutritional status

Grades of malnutrition	Weight for Height Wasting		Weight for age Underweight		Height for age Stunting	
	No.	%	No.	%	No.	%
Severe	69	7.3	77	8.2	119	12.7
Moderate	137	14.6	225	24.1	200	21.4
Normal	727	77.9	631	67.6	614	65.8
	933	100	933	100	933	100

Table 3: Age -wise distribution of children according to the presence of morbidity

Morbidity in last 15 days	Age in months				Number	Percentage
	12-24	25-36	37-48	49-60		
Fever	14	16	6	10	46	4.9%
Respiratory Cold/URTI/ LRTI	34	42	32	40	148	15.9%
Gastrointestinal Acute GE	13	9	5	6	33	3.5%
Eye	0	0	1	0	7	0.8%
ENT	0	5	1	1	7	0.8%
Skin	6	3	5	5	19	2.0%
Others (trauma, burns)	2	5	4	5	10	1.1%
No morbidity	141	157	163	202	663	71.1%
Total					933	100
$\chi^2 = 29.367, df = 21, p = 0.105$						

Discussion

In the following study, the most common morbidity noted among under-five children was under-nutrition. Apart from under-nutrition, 28.9% of children suffered from other morbidities. Common among the other morbidities were respiratory illness (15.9%), fever (4.9%), acute GE (3.5%). Similar findings have been reported in NFHS-3[5] and studies by Sachithananthan V, Chandrashekhar U.[6] In a study conducted in Etawah district of Bhopal[2], it was noted that children suffered from multiple episodes of diarrhea followed by

Upper respiratory tract infections. Jammu study [7] showed a much higher prevalence of acute respiratory infections (47.26%), diarrhoeal diseases (30.10%). The analysis by sex showed that females suffered more number of episodes of illness i.e., 5.6 episodes/ child/ year whereas in males it was only 4.0 episodes per child per year in Jammu study.[7] But in our study no such difference in sex was noted. Jain S et al (2000)[8] reported a high prevalence of anaemia in children of age 1-2 years in urban slums of Meerut in contrast to our study where the prevalence was high in 4-5 year age group. Also prevalence of anaemia was found to be

Table 4: Age-wise distribution of morbidity in children based on clinical assessment

Morbidity	Age in months				Number	Percentage
	12-24	25-36	37-48	49-60		
Fever	4	2	4	1	11	1.17%
Cold/ URTI	20	21	14	25	80	8.57%
Caries	7	12	20	57	96	10.28%
Anaemia	22	45	52	74	193	20.68%
Ear	1	3	7	3	14	1.5%
Eye	0	0	0	4	4	0.43%
Skin	15	14	16	11	56	6.0%
Injuries	1	6	4	4	15	1.6%
Others (Burns, deformities, congenital anomalies, operation scar)	3	3	4	4	14	1.5%
No morbidity	137	131	96	86	450	48.23%
Total					933	100
$\chi^2 = 123.14, df = 27, p = 0.000$						

Table 5: Association between nutritional status and morbidity in children

Past illness requiring hospitalisation						
Hospitalisation	Wasting		Underweight		Stunting	
	No.	%	No.	%	No.	%
Yes	36	17.47	57	18.87	46	14.42
No	170	82.5	245	81.12	273	85.5
	X ² = 0.079,df=1, p=0.778		X ² = 1.337,df=1, p=0.248		X ² = 2.007,df=1, p=0.157	
Present illness over past 15 days						
Illness	No.	%	No.	%	No.	%
Yes	79	38.3	107	35.43	101	31.66
No	127	61.6	195	64.56	218	68.33
	X ² = 11.385,df=1, p=0.001*		X ² = 9.150, df=1, p=0.002*		X ² = 1.747, df=1, p=0.186	
Morbidity based on clinical assessment						
Morbidity	No.	%	No.	%	No.	%
Present	97	47.08	147	48.6	158	49.5
Absent	109	52.9	155	51.32	161	50.47
	X ² = 0.973,df=1, p=0.324		X ² = 2.320,df=1, p=0.128		X ² = 1.711,df=1, p=0.191	

significantly higher in children having low nutritional status as compared to normal nutritional status but this was not statistically significant.

Prevalence of gastrointestinal, respiratory illness and fever was higher in younger children than older children in a Pune study[9] which was similar to the results of our study. Major morbidity was nutritional may be due to low purchasing power of the families as most of the families belonged to socioeconomic class IV and class V. In the present study, the overall prevalence of underweight, stunting and wasting was 32.36 %, 34.19 % and 22.07%, respectively. The prevalence of underweight in the present study (32.36%) was less than the national prevalence as assessed during NFHS-3 survey (43%).[5] A study done in West Bengal reported a similar prevalence of underweight and wasting of 33.9%, & 19.4%, but a lesser prevalence of stunting (26.1%).[10] Wardha study reported a much higher prevalence of underweight (47.4%).[11] Tanzania study[12] reported a underweight prevalence of 31.2% but a low prevalence of wasting (17.2%) and stunting (17.2%). In our study, 8.3 %, 12.8 % and 7.4 % of children were found to be severely

underweight, stunted and wasted, respectively. Our results were much higher compared to Tanzania study[12] where the proportion of severe underweight was 6% and severe wasting and stunting 3.2%. In contrast, Wardha study[11] reported a much higher percentage of underweight (16.9%).

Past history of illness played an important role in the nutritional status of children in a Nagpur study[1], but in our study past history of illness had no significance ($p > 0.05$ Table 5)

Conclusion

Total number of under-five children, assessed were 933. Number of female children was more than male children. Maximum number of children belonged to 4-5 years age group. The most common morbidity noticed was malnutrition.

Respiratory tract infection topped the list of health problems in under-fives followed by diarrhoea, fever, skin diseases, eye diseases and ear problems. The present study concludes that acute respiratory infections and diarrheal

diseases are still common among under five children through Govt. of India has made sincere efforts to improve the overall health of under-five children using a multi- pronged approach under NRHM.

Recommendations

1. Under five children should receive highest priority.
2. Specific health promotional, preventive and curative services should be provided to reduce the under five morbidity and mortality.
3. For the prevention of these diseases, parent education should start as early as possible especially during antenatal period or early postnatal period.
4. Continuing medical education of health professional with emphasis on their role not only in management but also in the administration of preventive should be carried out periodically.

Limitations of the study

History of past morbidity was based on recall of the anganwadi teacher and the parents of under-five children. So there could be a possibility of recall bias. Since diagnosis of anaemia was based on clinical examination, observer bias is possible.

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