Prevalence and determinants of morbidity among under five children in rural area of Tamil Nadu

Roopak Visakan Raja[1*], Rubini M S[2], Hemalatha K[3]

1 CRRI, 2 CRRI, 3 Assistant professor, Department of Community Medicine; Chennai Medical College Hospital and Research Centre, Tiruchirappalli, Tamil Nadu

*Corresponding author: Roopak Visakan Raja

Abstract

The first few years of life are the most crucial period as this age is known for accelerated growth and development and any adverse influences during this period may result in severe limitations in their development which warrants regular monitoring. Objectives of the study were to find out the prevalence and pattern of morbidity among children in rural area and to assess the risk factors. A community based cross sectional study was conducted among 396 under five children residing in a rural area of Tiruchirappalli district of Tamil Nadu. Among the 396 children screened the prevalence of morbidity was 71%. Respiratory tract infection was the most common morbid condition. Female (78%) were more affected than males. Maternal illness, age of the mother during delivery, age, gender and nutritional status of the child has a significant bearing on the occurrence of disease among children.

Key words: under five children, morbidity, rural, risk factors

Introduction

The health of an individual has a direct relationship with human resources and economic development of a country. Since the introduction of Alma Ata declaration to achieve "Health for All by 2000", lot of planning, effort and public expenditure had been devoted to improve health of the people in India. Further, the spread and accessibility of medical care has also improved substantially across the country. However, inspite of these efforts, India is one of the developing countries, which have high levels of morbidity[1]. Child health has been given greatest priority over the years both at National and State level. Children are backbone of the country and their health is a prime concern. The first few years of life are the most crucial period as this age is known for accelerated growth and development; warranting regular monitoring and any adverse influences during this period may result in severe limitations in their development[2] as 40% of physical growth and 80% mental growth occurs during this period. Children under five years of age are the most vulnerable section of the society and are affected most by various common and easily treatable illnesses. The major diseases affecting this age group are mainly acute respiratory tract infections, diarrheal diseases, anemia, skin diseases, and ear discharge, etc. Globally, there is variation in morbidity pattern among under-five children in different countries. Malnutrition among under-five children is a major public health problem in India. This is reflected by the fact that the prevalence of under-weight children in India is among the highest in the world, and is nearly double that of Sub-Saharan Africa[3].The National Family Health Survey–3 (2005-06) showed huge variation in childhood morbidity profile among different states and ARI was noted as a disease of highest prevalence among under-five children[4]. Many studies had been undertaken in various parts of the country to reveal the magnitude and nature of morbidity profile among under-five children[5-11]. However, findings of these studies indicate extent of the problem and geographical differences highlighting the need for area specific strategies and interventions. The burden of morbidities appears particularly high among rural and indigenous tribal populations who constitute

about 8.2% (84.3 million) of total population in India[12]. The socio economic conditions, ignorance due to illiteracy, unhygienic conditions, overcrowding makes these people more susceptible to various communicable diseases and malnutrition. A number of child survival strategies implemented by Government of India 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). Literature search necessitates the need for community-based information on morbidity patterns among under-five children, which can be used to assess the overall impact of various ongoing nutritional and disease control programs as well as in planning resource allocations. Thus the present community based study is an attempt to address the morbidity and nutritional status among the under five children and its association with various socio-environmental factors in a demographically defined area of Trichy District of Tamil Nadu, India in order to identify the health care needs and also to plan appropriate interventions to supplement and strengthen the existing health care delivery system in the area.

Aims and objectives

1. To find out the prevalence and pattern of morbidity among children in rural area
2. To assess the risk factors

Methodology

A community based cross sectional descriptive study was conducted among 396 under five children residing in a rural area of Tiruchirappalli district of Tamil Nadu. After obtaining ethical clearance the study was conducted for a period of 2 months between January to February 2016. Sample size was calculated as 378[13]. Cluster sampling was used to select the children residing in rural health training centre service area of a medical college in Tiruchirappalli. There were a total of 10 villages in the service area and of which 2 were randomly selected. House visits were made by the authors to collect data. For those who were not available during first visit, a second visit was made. Mothers of the under five children were interviewed using a predesigned structured interviewer administered proforma. The questionnaire included information about the socio-demographic variables, environmental and housing conditions, antenatal and postnatal information and the illness suffered by the child in the past 1 month. The children were examined for presence of health problems and anthropometric measurements were taken to assess their nutritional status. Weight, height, mid upper arm circumference was measured. Standard procedures were followed for anthropometric measurements. Modified BG Prasad's scale was used to classify socio economic status. Statistical analysis: Data collected was entered in MS excel and analysed using SPSS software version 21. WHO anthroplus software was used to categorize nutritional status of the children. The results were presented in the form of mean, percentages and proportion.

Results

A total number of 396 children were examined and their mothers were interviewed. A total of 284 (71.7%) children suffered atleast one episode of illness in the previous 1 month. Of the total children examined 232 (58.6%) were male and rest were female children. Majority (76.8%) of the children were Hindus, 48 (12.1%) were Christians and 44 (11.1%) were Muslims. Upper middle and middle class contributed to 64% of the study population (Table 1). Forty seven percent, 31.3% and 21.2% of the children were living in pucca, semipucca and kutcha house respectively. Cross ventilation was present only in 54.5% of the households. Two third of the houses had separate kitchen, 83% of the households were using LPG as cooking fuel and 53.5% of the kitchen had smoke vent. Municipal water was the source of drinking water for 79% of the families and 54% did not use any purification method. Fifty seven percent of the families follow dumping as a method of garbage disposal. All

the mothers (100%) had atleast 4 antenatal visits in a health facility. Sixty mothers (15.2%) suffered health problems during antenatal period which includes gestational diabetes, pregnancy induced hypertension and chicken pox. Majority of the children (88.9%) were of normal birth weight and 44 (11.1%) children belonged to low birth weight category. During the time of delivery 85% of the mothers were aged between 19 to 29 years, 28 (7.1%) mothers were aged below 19 years and 32 (8.1%) were aged above 29 years. Almost 60% of the mothers had normal vaginal delivery, 136 (34.3%) was caesarean section and 20 (5.1%) was assisted delivery. Ninety three percent of the children were of first and second order birth and 28 (7.1) children belonged to third order birth. All the deliveries were institutional deliveries either Government or private. Majority (97%) of the children were breast fed within 1 hour of birth. Exclusive breast feeding for 6 months was received by 364 (92%) children. Sixty percent of the children received supplementary feeding at the end of 6 months, 32 (8%) children received it before 6 months and for 124 (31.3%) children supplementary feeding was initiated after 7 months of age. Cent percent children were immunization upto date. Table 2 shows various categories of illness suffered by the children. The proportion of female children affected was higher compared to boys. Maximum number of diseased children were found in the age 4 to 5 years i.e. 90%were affected. Children belonging to upper socio economic class were more affected by diseases than others (Table 3).Children growing in pucca houses were most affected (74.5%).Houses with poor ventilation had a positive co relation with diseased children (75.6%).Children belonging to the households who did not follow any type of water purification process were the highest victims (74.1%).Surprisingly morbidity was higher in families where LPG was the main source of energy (75.65%). Houses with poor smoke ventilation were invariably associated with illnesses (76.1%) (Table 4). Mothers with pre-existing diseases during pregnancy were invariably associated with children affected by diseases. All the children born to mothers within the age of 30 to 35 years were affected (100%) followed by the age group of 25 – 29 and less than 19 years. Children born with low birthweight, that is less than 2.5kg, were most affected (72.7%). Early initiation of supplementary feeding correlated with highest number of affected children (Table 5). Among the affected children only 96 (24.2%) underwent treatment in a health facility.

Discussion

The morbidity among children under 5 years, sampled in a rural area of Trichy, was 71.7 % i.e., of the total 396 children sampled, 284 children were affected. The most common morbid condition among the sampled paediatric population was found to be respiratory infection (47.5%).This data includes co-existence of multiple conditions/symptoms together at the same time. Various factors and co factors were analysed. Recent data from various studies[8,9,15] also report that malnutrition, respiratory infection and diarrhoeal diseases are still major problem among under five children. All the children were immunized correctly and appropriately according to their respective age groups. The proportion of girl and boy children affected was 78% and 67% respectively. This shows that morbidity was higher among girl children probably due to inadequate care and gender inequality. These findings are consistent with another study[16]. Morbidity was highest among the children aged 4 to 5 years (90%) followed by the age group 3 to 4 years (77%). Children belonging to upper class families were most affected – an unexpected 84 % followed by the middle class children.

Poor ventilation, both air and smoke, was significantly associated with the morbidity in present study - about 75% of the children living in houses with poor ventilation were affected. Association between overcrowding and childhood illness was reported by another study[17]. No significant association of morbidity with location of kitchen was observed in the current study but highest morbidity was noticed in children growing in pucca houses, which is a topic of debate. Children following open defecation practices were more vulnerable to diseases in the current study. The paediatric population which drank water which was not purified by any

method were more prone to episodes of illness, 74% were affected. These findings are consistent with other studies conducted in rural Tamil Nadu.

Mothers with pre-existing diseases during pregnancy were invariably associated with children affected by diseases. Greater the age of the mother at the time of childbirth greater was the prevalence of morbidity among the children. All the children born to mothers of age group >30yrs were affected in the current study which is consistent with established literature. Birth weight has a direct correlation with the health of the children. Children with lower birth weight i.e. less than 2.5 kgs were more affected (81.8 %) when compared to normal birth weight children. Children who received exclusive breast feeding were more affected compared to those who did not. These findings need further analysis. Inconclusive finding on relation between breast feeding practices and childhood morbidities were reported[18]. Delayed initiation of supplementary feed correlated with highest number victims (76 %).

Another important revelation was that among the 284 affected children only 96 (24.2%) approached health facility for treatment. Reasons were the illness was mild in nature not requiring intervention, belief that the disease may settle on its own and home based treatment. This showed lack of early health care seeking behaviour. Among 396 children studied, 62.62% were under weight and 2% were overweight according to their weight for age. Lower[19] and also higher prevalence[20] of underweight were reported. Children with both underweight and overweight were more prone to develop illness. Correlation of under nutrition among children and morbidity has been constantly proven by many studies[19,21].

Conclusion

Of the 396 children studied, 78% of female children and 67% of male children were affected by some form of illness (fever, cold, cough, sore throat, skin infection, rash, ear pain, conjunctivitis, diarrhoea, alopecia and dental carries). Only 24.4% underwent treatment. Gender of the child, type of fuel used for cooking, maternal illness, mothers age, nutritional status of the child were significantly associated with illness.

References

1. Deshpande RV. Morbidity Differentials in Rural Karnataka. The Journal of Family Welfare 1998;4(4):9–14.

2. UNICEF. Data on under five health and statistics. Available from http://data.unicef.org/child-health/pneumonia.html [Last accessed on 15th March 2015

3. World Bank. India, Undernourished children: A call for reform and action. Available from:http://web.worldbank.org/wbsite/external/countries/southasiaext/0,contentmdk:20916955~pagePK:146736~pi PK:146830~theSitePK:223547,00.html.

4. Ministry of health and Family Welfare. Key indicators for India. National family and health survey 3fact sheets. Available from http://rchiips.org/nfhs/pdf/India.pdf . [Last accessed on 15th March 2015]

5. Ukey UU, Chitre DS. Morbidity Profile of Pre-School Children in an Urban Slum Area. Indian Medical Gazette August 2012;300-304.

6. Dongre AR, Deshmukh PR, Garg BS. Childhood morbidity, household practices and health care seeking for sick children in a tribal district of Maharashtra, India. Indian J Med Sci. 2010;64(1):7-16.

7. Narkhede V, Sinha U, Bhardwaj SD, et al. Morbidity profile in under five children in urban slum area of nagpur. National Journal of Community Medicine 2012;3(3):442-46.

8. Gupta S, Jamwal DS, Kumar D, Gupta SK. Morbidity among Under Five Children in a Rural Area of Jammu. Journal of JK Sciences. 2012;14(2):85-88.

9. Singh NH, Devi SH, Singh MY. Study on morbidity among under-five children of a rural area of manipur, thanga: A cross-sectional study. Journal of Evolution of Medical and Dental Sciences 2013;16(2):2643-47.

10. Srivastava DK, Tripathi D, Gour N, et al. Morbidity Profile of Under five Children in urban slums of Etawah District, Bhopal, India. Indian Journal of Community Health. 2012;24(2):153-57.

11. Lakshmi JA, Begum K, Saraswathi G, Prakash J. Influence of Nutrition and Environment on Morbidity Profile of Indian Preschool Children. Malaysian Journal of Nutrition. 2005;11(2):121-32.

12. Report of the expert group to recommend the detailed methodology for the identification of families living below poverty line in the urban areas. Prospective planning division. Planning Commission, Government of India. New Delhi. 2012. Available from: http://planningcommission.nic.in/reports/genrep/rep_hasim1701.pdf [Last accessed on 15th March 2015].

13. Thirunavukarasu MR, Dongre AR. Social determinants and household practices for acute childhood morbidities in Rural Tamil Nadu. Indian Journal of Maternal and child health 2014;16(2):1-15

14. Mangal A, Kumar V, Panesar S et al. Updated BG Prasad socioeconomic classification, 2014: A commentary. Indian J Public health 2014.59(1):42-44

15. Abhulimhen -Iyoha BI , Okolo AA. Morbidity and mortality of childhood illness at the emergency pediatric unit of the university of the Benin teaching hospital, Benin City. Niger J Paed 2012; 39(2): 71-74

16. Amla C and Chowdhary KC.Studies of morbidity patterns of children in Urban community. Ind J Paediatrics 1962; 29:145

17. Gupta S, Jamwal DS, Kumar D, Gupta S K. Morbidity among Under Five Children in a Rural Area of Jammu. JK Science 2012;14(2):85-88.

18. Ganguly E, Sharma PK, Bunker CH. Prevalence and risk factors of diarrhoea morbidity among under five children in India: A systematic review and meta analysis. Indian J child Health 2015;2(4):152-160.

19. Nandy S, Irving M, Gordon D, et al. Poverty, child under nutrition and morbidity: new evidence from India. Bull world health organ 2005.83(3): 210-216.

20. Singh JP, Gupta SB, Shrotriya VP, Singh PN. Study of nutritional status among under five children attending outpatient department at a primary care rural hospital Bareilly (UP). Sch. J. App. Med. Sci., 2013; 1(6):769-773

21. Ramachandran P, Gopalan HS. Under nutrition and risk of infection in preschool children. Indian J Med Res 2009.130:579-583.

TABLES

Table 1: Socio-demographic details of the study population

Independent variable	Frequency (%)
Age of the child	
Less than 1 year	48 (12.1)
1-2 years	132 (33.3)
2-3 years	120 (30.3)
3-4 years	56 (14.1)
4-5 years	40 (10.1)
Gender	
Male	232 (58.6)
Female	164 (41.4)
Socio economic status[14]	
(per capita monthly income)	
Class I (>5356)	76 (19.2)
Class II (2652 to 5356)	132 (33.3)
Class III (1570 to 2651)	124 (31.3)
Class IV (811 to 1569)	52 (13.1)
Class V (<811)	12 (3)
Total	**396 (100)**

Table 2: Pattern of morbidity among children

ILLNESS	FREQUENCY	PERCENT
Respiratory infection (cough, cold, sore throat, fever)	188	47.5
Dermatological problems (skin infection, rash, alopecia)	28	7.1
Diarrhoeal disease	20	5.1
Dental caries	16	4
Diarrhoeal disease and respiratory infection	8	2
Dermatological problems and respiratory infection	8	2
Fever	8	2
Conjunctivitis	4	1
Otalgia	4	1
No morbidity	112	28.3
Total	396	100

Table 3: Association between socio-demographic variables and morbidity

Independent variable	Morbidity present (%)	Normal (%)	χ2	p value
Age of the child				
Less than 1 year	24 (50)	24 (50)	21.6	**0.00**
1-2 years	100 (75.8)	32 (24.2)		
2-3 years	80 (66.7)	40 (33.3)		
3-4 years	44 (78.6)	12 (21.4)		
4-5 years	36 (90)	4 (10)		
Gender				
Male	156 (67.2)	76 (32.8)	5.53	**0.01**
Female	128 (78)	36 (22)		
Socio economic status				
Class I	64 (84.2)	12 (15.8)	8.9	0.06
Class II	92 (69.7)	40 (30.3)		
Class III	88 (71)	36 (29)		
Class IV	32 (61.5)	20 (38.5)		
Class V	8 (66.7)	4 (33.3)		

Table 4: Association between housing and environmental conditions and morbidity

Independent variable	Morbidity present (%)	Normal (%)	χ2	p value
Type of house				
Kutcha	60 (71.4)	24 (28.6)	1.6	0.4
Pucca	140 (74.5)	48 (25.5)		
Semi pucca	84 (67.7)	40 (32.3)		
Cross ventilation				
Present	148 (68.5)	68 (31.5)	2.39	0.12
Absent	136 (75.6)	44 (24.4)		
Separate kitchen				
Present	192 (72.7)	72 (27.3)	0.39	0.5
Absent	92 (69.7)	40 (30.3)		
Cooking fuel				
Wood	12 (42.9)	16 (57.1)	16.6	**0.00**
Kerosene	24 (60.0)	16 (40.0)		
LPG	248 (75.6)	80 (24.4)		
Smoke vent				
Present	144 (67.9)	68 (32.1)	3.2	0.07
Absent	140 (76.1)	44 (23.9)		
Drinking water purification				
Followed	124 (68.9)	56 (31.1)	1.3	0.25
Not followed	160 (74.1)	56 (25.9)		
Toilet facility				
Open air defecation	216 (72)	84 (28)	0.04	0.8
Sanitary latrines	68 (70.8)	28 (29.2)		

Table 5: Association between maternal, child related variables and morbidity

Independent variable	Morbidity present (%)	Normal (%)	χ2	p value
Maternal illness				
Yes	56 (93.3)	4 (6.7)	16.2	**0.00**
No	228 (67.9)	108 (32.1)		
Age of mother at delivery				
Less than 19 years	20 (71.4)	8 (28.6)	14.1	**0.003**
20-24 years	144 (67.9)	68 (32.1)		
25-29 years	88 (71)	36 (29)		
30 and above	32 (100)	0		
Birth weight				
Low birth weight	36 (81.8)	8 (18.2)	2.4	0.1
Normal birth weight	248 (70.5)	104 (29.5)		
Birth order				
1	140 (68.6)	64 (31.4)	2.1	0.3
2	124 (75.6)	40 (24.4)		
3	20 (71.4)	8 (28.6)		
Exclusive breast feeding				
Yes	264 (72.5)	100 (27.5)	1.4	0.2
No	20 (62.5)	12 (37.5)		
Supplementary feeding				
Before 6 months	20 (62.5)	12 (37.5)	2.6	0.2
End of 6 months	174 (70.7)	72 (29.3)		
Delayed initiation	90 (76.3)	28 (23.7)		
Nutrition status of child				
Under weight	196 (79)	52 (21)	24.3	**0.00**
Normal	80 (57.1)	60 (42.9)		
Over weight	8 (100)	0		