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Magnitude and Factors Influencing Diarrhea among Under-5 Children in Rural Areas of Chittoor, Andhra Pradesh

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ABSTRACT

Introduction: Acute diarrheal diseases constitute one of the leading cause of morbidity & mortality in children below five years of age. Assessing the prevalence of diarrhea and associated factors among children of age under five will be helpful in determining the disease burden and in planning and implementation of prevention strategies at the community level. The study was conducted with the objectives to assess the prevalence and factors associated with diarrhea among under five children with diarrhea

Methodology: This is across sectional study with sample size of 429. Eight villages from V.Kota and Kuppam mandals, 25 houses from each village were selected randomly. Data regarding various sociodemographic factors, environmental and behavior factors were collected. Statistical analysis was done using Chi-square test and odds ratio was calculated for various factors.

Results: the prevalence of diarrhea was estimated to be 47.6% (CI 42.4 – 51.7). Factors such as education of the mother, hand washing practices, use of soap during hand washing, source of drinking water, disposal of stools were significantly associated with prevalence of diarrhea

Conclusion: Awareness of factors influencing diarrhea and simple interventions can reduce the burden of the diarrheal diseases.

Keywords: prevalence, diarrhea, Chittoor, Andhra Pradesh

INTRODUCTION

In developing countries, children are affected by diseases that are preventable and treatable with simple interventions and diarrhea is one among those diseases. In these countries the under five children are 10 times more vulnerable to death because of such diseases when compared to developed/Industrialized countries.[1,2]

There is been an improvement in the mortality and morbidity among under five children in India in recent past. The overall deaths of under five children has reduced from 2.5 million in 2001 to 1.5 million in 2012.[3] But still it is important to note that the proportional mortality because of diarrheal disease remains high. Acute diarrheal diseases constitute one of the leading cause of morbidity & mortality in children below five years of age.

In developing countries, children under the age of three years suffer from average three episodes of diarrhea per year .[4,5] Diarrheal diseases account for 1 in 9 child deaths worldwide, making diarrhea the second leading cause of death among children younger than the age of five[6] In India, 8% of deaths can be attributed to diarrheal diseases in the children under five years of age[7] and 10.7 million Diarrheal disease were reported in the year 2013 with 1535 deaths in India.[7]

Epidemiologic studies show that factors determining the occurrence of diarrhea in children are complex. Contribution of each factor varies as a function of interaction between socio-economic, environmental and behavioural variables[8]. Each episode of diarrhea worsens the nutritional status of the children. As a result malnourished children are vulnerable to further attacks of diarrhea.The Diarrheal disease is preventable and is characterized by the passage of loose or watery stools three or more

times over a 24-h period [9]. This study is helpful in determining the disease burden and in planning and implementation of prevention strategies at the community level. Objectives of the study were to assess the prevalence of diarrhea and the factors associated with it among under five children.

METHODOLOGY

This is a cross sectional study carried out in the rural areas of Venkatagirikota and Kuppam mandals of Chittoor district in Andhra Pradesh. Children between the age of 6 months to 60 months (Five years) were included in the study. Considering the reported prevalence of diarrhea in previous literatures[10,11] the sample size required for the study was calculated to be 400. Total of 429 children were included in the study. Children in the age group of 6 months to 60 months (5 years) were included in the study. Written informed consent was taken from he the primary informant. Those who were not willing to take part in the study were excluded.

Collection of data: Villages under Venkatagiri Kota and Kuppam mandals were enlisted and 8 villages from each mandals were selected randomly. Houses in each village were numbered and 25 houses were selected randomly using random number table. One study subject was included in each selected household hence including 25 samples from each village. If no subjects were available those meeting our inclusion criteria in a selected house, subsequent numbered houses were selected for collection of data. Mother of the Child was preferred as the primary Informant.

Definition of diarrhea: Diarrhoea is the passage of unusually loose or watery stools, usually at least three times in a 24 hour period. However, it is the consistency of the stools rather than the number that is most important.[12] Any such episodes in the past two weeks from the day of visit to the household was considered as a positive case.

Statistical analysis: Chi-square test has been used to test the significance of prevalence of diarrhea in association with various socio demographic factors. P value less than 0.05 is considered as significant. Risk ratio has been used to find the strength of association of various factors with diarrhea. Statistical software namely epi info version 22 was used for analysis of the data. Microsoft excel was used for data entry.

RESULTS

A total 429 children between 6 months to 60 months of age were included in the study. The mean age of the study subjects was 28.76 (SD 17.83). Among the subjects 217 (50.6%) were male and 212 (49.4%) were female children. Majority of the children (57.8%) belonged to nuclear family.

Mothers of the children were the primary informant in majority of study subjects 332 (77.4%), whereas grand mother and father were the primary informant in 13.3% and 7.2% respectively.

Of the total 429 children 204 children had diarrhea with respect to the case definition included in the study. Hence the prevalence of diarrhea was estimated to be 47.6% (CI 42.4 – 51.7).

Various sociodemographic factors were assessed in relation to occurrences of diarrhea. Education of the mother had a significant association ($P < 0.05$) with occurenes of diarrhea (Table 1). Children of the mother educated secondary school and above had lesser odds of experiencing the diarrheal episodes.

Similarly, children of birth order ≥3 and male children where slightly more vulnerable to experience the episode of diarrhea (Table 1).

The association of gender with prevalence of diarrhea was not statistically significant (Table:2).

Table 1: Sociodemographic characteristics and distribution of occurrences of diarrhea

Characteristics	Diarrhea N=429		RR (95% CI)	*P**
	Yes (%)	No (%)		
Education of mother/caregiver (n=429)				
Primary & Below (including not literate)	127 (52.5)	115(47.5)	1.22 (1.04 -1.45)	0.01**
Secondary & Above	76 (40.6)	111(59.4)	0.76 (0.61-0.95)	
Education of Father				
Primary & Below (including not literate)	109 (51.4)	103(48.6)	1.17 (0.97-1.42)	0.07
Secondary & Above	93 (43.3)	109(56.7)	0.84 (0.70-1.02)	
Birth Order				
≤2	89(44.9)	101 (55.1)	0.92 (0.75-1.17)	0.42
≥3	108(48.4)	115(51.6)	1.06 (0.89-1.27)	
Gender of the child				
Male	112 (51.6)	105(48.4)	1.18 (0.98-1.43)	0.08
Female	91(42.9)	121(57.1)	0.83(0.68-1.01)	

RR: Risk ratio CI: Confidence interval. * chi-square test **significant

Table 2: Distribution of Diarrhea among various age groups

Age in Months	Male		Female		Total (%)	P*
	Diarrhoea Present (%)	Absent (%)	Diarrhoea Present (%)	Absent (%)		
6-11	32(58.2)	23(41.8)	17 (47.2)	19 (52.8)	91 (100)	0.30
12-23	17 (58.6)	12 (41.4)	21 (47.7)	23 (52.3)	73 (100)	0.36
24-35	16 (43.2)	21 (56.8)	17 (48.6)	18 (51.4)	72 (100)	0.65
36-47	19 (50)	19 (50)	19 (47.5)	21 (52.5)	78 (100)	0.82
48-59	28 (48.3)	30 (51.7)	18 (31.6)	39 (68.4)	115 (100)	0.06
Total	112 (26.1)	105 (24.5)	92 (21.4)	120 (28)	429 (100)	0.08

* chi-square test

Table 3: Factors influencing Diarrhea

Characteristics	Diarrhoea		RR (95% CI)	*P**
	Present (%)	Absent (%)		
Bottle feeding in age group 6-11 months (n=91)				
Yes	32(62.7)	19(37.3)	1.44 (0.98-2.13	0.36
No	17(42.5)	23(57.5)	0.63 (0.39-1.01)	
Separate kitchen (n=426)				
Present	167(46.1)	195 (53.9)	0.93 (0.85-1.01)	0.08
Absent	375 (57.8)	27 (42.2)	1.49 (0.94-2.35)	
Hand washing practices (n=429)				
Present	151 (44.3)	190 (55.7)	0.87 (0.79-0.96)	0.008
Absent	53 (60.2)	35 (39.8)	1.67 (1.13-2.44)	
Use of soap for hand washing (n=341)				
Present	103 (38.1)	167 (61.9)	0.77 (0.68-0.87)	<0.001**
Absent	48 (67.6)	23 (32.4)	2.62 (1.67-4.11)	
Source of drinking water (n=429)				
Improved	115 (41.7)	161 (58.3)	0.78 (0.68-0.91)	0.001**
Unimproved	89 (58.2)	64 (41.8)	1.53 (1.18-1.98)	
Stool disposal (n=426)				
Proper	65 (38.2)	105 (61.8)	0.68 (0.53-0.87)	0.002**
Improper	137 (53.5)	119 (46.5)	1.27 (1.09-1.49)	
Latrine (n=426)				
Present	70 (42.9)	93 (57.1)	0.83(0.65 -1.06)	0.08
Absent	131(50.4)	129(49.6)	1.12(0.96-1.6)	

RR: Risk ratio. CI: Confidence interval. * chi-square test. ** significant

Whereas study show that males have higher odds (OR 1.39) of suffering from diarrhea than females. Majority of the children with diarrhea 49 (24%) belonged to the age group of 6-11 months followed by the 46 (22.5%) belonging to the age group 48-59 months. Highest prevalence of diarrhea 53.8% was seen in the children in 6-11 months of age group (Table: 2) followed by the age group 12-23 months (Table: 2). Distribution of diarrhea among various age groups was not statistically significant.

Various factors influencing the occurrence of diarrhea were assessed in the study. The factors like use of soap for hand washing, source of drinking water, method of stool disposal were all having statistically significant association ($p < 0.05$) with occurrences of diarrhea among children (Table:3).

DISCUSSION

The present study investigated the sociodemographic, environmental factors assocated with diarrhea. The two week prevalence of diarrhea in the children between 6 months to 60 months was estimated to be 47.6%. The criteria of two week prevelance of diarrhea among under five children was comparable to various other studies conducted in India[13], Ethopia[14] & Egypt[15].

The estimated prevalence of diarrhea in the present study is high and emphasis the need for more attention. Study conducted by Anil Gupta[16] showed overall prevalence of 5.5%. Few other studies[10,11] estimated the prevalence at 25.2%, 73.21%.

The study showed high prevalence of diarrhea among the children between 6-11 months this is in agreement to few other studies[14,16] conducted. Our study estimated the Diarrhea prevalence of 53.8% in the agegroup of 6-11 months.

Various studies[17,18] have shown the importance of hand washing in reducing the occurrence of childhood diarrhea. Similarly in our study hand washing behavior was significantly associated with the occurance of Diarrhea. Source of drinking water and method of stool disposal were significantly associated with occurrence of diarrhea. Most of the household collected water from a public tap using

plastic containers. Contamination of water could occur during transportation and improper storage at house, improper disposal of stool along with general waste, indiscriminate throwing of stools roadside, increases the chances of spread of infection. These findings emphasize the importance of hygiene behavior. Improved access to drinking water and sanitation facilities still needs more attention.[19]

Bottle feeding is known risk factor for diarrhea confirmed by various studies.[20] In our study bottle feeding was not significantly associated with the prevalence of diarrhea. It could be because of the small sample size and wide age group involved in the study. However, the children who were on bottle feeding had higher relative risk of having diarrhea when compared to the children who were not bottle fed.

Studies have shown that families that do not have an improved latrine have higher odds of children suffering from diarrhea.[21] similarly in our study, children from the household which didn't have latrine had higher relative risk of suffering from the diarrhea. The association of latrine with the prevalence of diarrhea was not statistically significant. This can be attributed to the non use of latrine facilities available at home, not practicing hand washing after use of latrine.

CONCLUSION

The two week prevalence of diarrhea among the children between 6 months to 60 months was 47.6% with 95% confidence interval (CI) 42.4% - 51.7%. Highest prevalence of Diarrhea was observed among the age group of 6-11 months (53.8%). Factors such as education of the mother, hand washing practices, use of soap during hand washing, source of drinking water, disposal of stools were significantly associated with prevalence of diarrhea. Awareness regarding these factors and simple interventions can reduce the burden of the diarrheal diseases.

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