IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 5 Ver. VI (May. 2015), PP 29-32
www.iosrjournals.org

Sociodemographic Profile of Acute Diarrhoeal Diseases in a Tertiary Care Hospital, Tirupati

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Abstract: *This cross sectional study was conducted among 200 acute diarrhoeal cases admitted in a tertiary care hospital, Tirupati during January-February 2010. The overall prevalence of diarrhoeal diseases was found to be 12.1%. Majority of the cases occurred among males (52.5%), 6-12 months age (37.5%), lower socioeconomic status (82.0%) and among those with non-working mother (92.0%). The prevalence of malnutrition was found to be 56.0% while 29.0% children were partially immunized.*

Keywords: *Acute diarrhea, low socio-economic status, malnutrition, prevalence, under fives*

I. Introduction

Globally there are nearly 1.7 billion cases of diarrhea every year. It is the second leading cause of death in under five children with 7.6 lakh deaths every year. It is also the leading cause of malnutrition in under five children [1]. Half of the deaths due to acute diarrhoeal diseases in under five children occur in five countries: India, Nigeria, Afghanisthan, Pakistan and Ethiopia [2].

It is estimated that one-third of total paediatric admissions and 17% of all deaths are attributed to acute diarrhoeal diseases. The household surveys carried out in India revealed a morbidity rate of 1.7 episodes of diarrhea per day per child [3]. Africa and South East Asia accounts for 80% of all the diarrhoeal deaths. Mortality due to acute diarrhoeal diseases among under fives has declined over the past two decades from an estimated 5 million deaths to around 1.5 million deaths in 2004. Despite this decline, it continues to be the second leading cause of death among under five children globally [4]. Thus the global estimates of mortality due to acute diarrhoeal diseases in under fives had shown steady decline since 1980. However the morbidity has not shown a corresponding decline and remains between 2-3 episodes of diarrhea per year per child [5]. In India, the proportional mortality rate due to diarrhea was 9.1% with an estimated projection of increase in years of life lost (YLL) from 1.7 lakhs in 2006 to 1.9 lakhs by 2016 [6].

The overall point prevalence of diarrhea in under fives in a study in Kashmir, India was found to be 9.3% being highest in 6-11 months (19.2%) with a slight male preponderance (10.4% in males compared to 8.1% in females) [7]. Another study in India has found a overall annual incidence in the first year as 1.1 per child which increased to 1.9 per child in second year with subsequent decline in 3-5 years' age group with common organisms isolated as Escherichia coli (5.8%), rotaviruses (5.6%) and Shigella (3.5%) [8]. In a study in northern India, the incidence of persistent diarrhea was found to be 6.3 per 100 child years being highest in 0-11 months (31 per 100 child years) with commonest organisms isolated as Enterotoxigenic Escherichia coli (9.3%), Campylobacter (4.7%), Salmonella (4.7%), Shigella, E.histolytica, rotaviruses (2.3 % each) [9].

Several studies had pointed out relation with type of feeding whether breastfed or bottle fed. In a Ethiopian study, a higher prevalence was found in partially breast fed infants (40%) compared to exclusively breast fed (12%) [10]. A study in Qatar has also found a higher attack rate in formula fed infants (48.7%) compared to exclusively breast fed (32.5%) [11]. It was also pointed out that low socioeconomic status of families and education and occupation of mother played a pivotal role in the diarrhoeal incidence and prevalence. A study in rural Alwar, India has found that incidence was higher with low socioeconomic status and illiteracy of mother [12]. Another study in India has also found a higher incidence with low socioeconomic status of the families [13]. The diarrhoeal incidence and prevalence also showed association with immunization and nutritional status of children. A population based study in South India found that partially immunized had 4.6 times higher risk of diarrhea while undernourished children had 14.4 times higher risk [14]. Malnutrition is an independent risk factor for frequency and severity of diarrhea and there is a vicious cycle in which sequential diarrhoeal disease leads to increasing nutritional deficiencies, impaired immune function and greater susceptibility to infection [15]. In this context, this present study was conducted to find socio-demographic profile of acute diarrheal diseases among under five children admitted to a tertiary care hospital, Tirupati, Andhra Pradesh.

II. Materials and methods

This cross sectional and analytical study was conducted in the Department of Paediatrics, Sri Venkateswara Ram Narayan Ruia Hospital, Tirupati which is a teaching hospital of Sri Venkateswara Medical College, Tirupati. The acute diarrhoeal cases admitted over a duration of 2 months (January and February 2010) in the hospital were taken serially and out of that 200 cases were selected randomly. A pretested interview schedule was used to collect the necessary information about the subjects. In most of the cases, the informant was mother (97.5%) while in a few cases, where the mother was not available, another responsible female attendant was interviewed for collecting the information. The socioeconomic status of the subjects was determined using updated BG Prasad classification [16] based on per-capita monthly income of families using updated All India Consumer Price Index for July 2009 (1167) [17]. 'Exclusively breast fed' was defined as feeding of the infant with breast milk exclusively and nothing else while partially breast fed are those children who were fed with bottle milk or formula milk with or without breast milk. The immunization status of children was assessed using the immunization cards available with the children. In rare cases, where immunization card was not available, the immunization status was assessed by detailed questioning of the respondent. The nutritional status of the child was assessed using Indian Academy of Paediatrics (IAP) classification with grades of I, II, III and IV malnutrition with specific cut off points. The data was analyzed using Epiinfo version 7.0 for windows (Centres for Disease Control, Atlanta, USA) and descriptive statistics were presented using percentages.

III. Results

It was found that out of a total admitted cases of 3,055 during the 2 months of January & February 2010, there were 369 cases of acute diarrhoeal diseases among under fives with a prevalence of 12.1%. A slight preponderance of males (52.5%) was found compared to females (47.5%). A majority of the children were aged between 6-11 months (37.5%) followed by 12-24 months (18.0%. A slightly higher subjects (52.0%) belonged to urban slum (Table 1).

Table 1: Age group, gender and residence distribution of acute diarrhoeal cases (N=200)

S.No		Parameter	No. of cases (%)
1.	**Age group**		
	(a)	Less than 6 months	10 (5.0)
	(b)	6 – 12 months	75 (37.5)
	(c)	1 – 2 years	36 (18.0)
	(d)	2 – 3 years	29 (14.5)
	(e)	3 – 4 years	27 (13.5)
	(f)	4 – 5 years	23 (11.5)
2.	**Gender**		
	(a)	Male	105 (52.5)
	(b)	Female	95 (47.5)
3.	**Type of residence**		
	(a)	Rural	96 (48.0)
	(b)	Urban	104 (52.0)

A majority of the subjects belong to lower socioeconomic status (82.0%). It was found that as much as 46.0% of the mothers of children were illiterates while a majority of them (92.0%) were non-working (Table 2).

Table 2: Socioeconomic status, literacy & working status of mother of acute diarrhoeal cases (N=200)

S.No		Parameter	No. of cases (%)
1.	**Socioeconomic status**		
	(a)	Upper	4 (2.0)
	(b)	Middle	32 (16.0)
	(c)	Lower	164 (82.0)
2.	**Education status of mother**		
	(a)	Illiterate	92 (46.0)
	(b)	Literate	108 (54.0)
3.	**Occupation of mother**		
	(a)	Non-working mother	184 (92.0)
	(b)	Working mother	16 (8.0)

It was found 47.0% children were fully weaned while 40.0% infants were exclusively breast fed. The immunization status was 'complete' in most of the cases (71.0%) while there were 29% children partially

immunized or not immunized. It was found that overall the malnutrition was found to be 56.0% children with majority in grade I (32.0%) followed by grade II (14.0%) and grade III & IV (10.0%) (Table 3).

Table 3: Feeding, immunization and nutritional status of acute diarrhoeal cases (N=200)

S.No		Parameter	No. of cases (%)
1.	**Feeding status**		
	(a)	Exclusively breast fed	80 (40.0)
	(b)	Partially breast fed	26 (13.0)
	(c)	Fully weaned	94 (47.0)
2.	**Immunization status**		
	(a)	Completely immunized	142 (71.0)
	(b)	Partially immunized	57 (27.5)
	(c)	Not immunized	1 (0.5)
3.	**Nutritional status**		
	(a)	Normal	88 (44.0)
	(b)	Grade I	64 (32.0)
	(c)	Grade II	28 (14.0)
	(d)	Grade III & IV	20 (10.0)

IV. Discussion

In this present study, the prevalence of acute diarrhoeal disease among under five children was found to be 12.1% among the hospital cases admitted. A higher prevalence was reported in other studies – Qatar (35.8%), [11] Thiruvallur (22.5%) [14], Aligarh [18], India (36.0%), West Bengal (31.7%)[19], Bangladesh (44.5%) [20]. A lower prevalence was however found in Kashmir (9.3%) [7]. The differences in the prevalence rates between the present study and other studies are due to differences in the time period, setting of the study and region.

In the present study, a slight preponderance of males (52.5%) was found compared to females (47.5%). Similar higher prevalence was reported in males than females in Kashmir study [7]. A higher prevalence was found in females (57.0%) than in males (43.0%) in Aligarh study [18], Thiruvallur study (23.8% vs 22.5%) [14], West Bengal study (36.9% vs 25.9%), [19]. Thus the prevalence of diarrhea was found to be similar in males and females as revealed in the present and other studies. A majority of the children were aged between 6-11 months (37.5%) followed by 12-24 months (18.0%. Kashmir study [14] also found the prevalence to be highest in 7-12 months (40.7%) followed by 13-24 months (32.1%) and least in those aged 25 months & above (12.0%). Ethiopia study [21] also found the prevalence to be highest in 12-23 months (31.0%) and lowest in less than 6 months (18.1%). Bern et al [22] also reported that the incidence is highest in 6-11 months with as many as 5 episodes per child per year. Qatar study [11] has however found higher prevalence in more than 2 years' children (56.5%) followed by 1-2 years' children (49.5%). Thus several studies had reported that the prevalence and incidence of diarrhea to be least in less than 6 months' children which may be due to breastfeeding and highest in 6-12 months or 1-2 years which may be attributed to the initiation of weaning during this period. After the age of 2 years, there is a steady decline of diarrhoeal diseases which may be due to increased immunity among children. A majority of the subjects in the present study belonged to lower socioeconomic status (82.0%). West Bengal study [19] also found a higher prevalence in lower socioeconomic status (41.0%) compared to middle (29.0%) and upper (25.0%) groups. In this present study, a higher prevalence was reported in relation to non-working mother with a significant proportion of mothers being illiterates. A higher prevalence with illiterate mothers was found in Ethiopia study [21] (25.5% vs 23.0%) and Alwar study [12]. Qatar study [11] has found higher prevalence in working mother group (60.1%) compared to non-working group (35.1%) while a higher prevalence was found with non-working mother (25.5%) than working mother (18.8%) in Ethiopian study [21]. Thus several studies had reported no relation with occupation of the mother while showing a possible relation to the literacy status of the mother.

V. Conclusion

The morbidity due to acute diarrhoeal diseases among under five children is still high (12.1% of hospital admissions). The risk is higher during the weaning period of 6-12 months and in malnourished children. Improving the socioeconomic status of families and especially female literacy can control the diarrhoeal diseases to a major extent.

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