



A Clinico-Epidemiological Study of Acute Diarrhoea in Under Five Children Admitted in a Tertiary Care Hospital in Western Maharashtra

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Abstract

Background: Diarrhoea has been defined in many ways, as an increased water content of stools, altered consistency, increased frequency or combinations of all these three. A lot has been studied regarding diarrhoea which establishes beyond doubt that, there are geographic variations in clinico-epidemiological profiles of diarrhoeas. Such differences are largely due to the pathogenic variance, levels of endemicity of diarrhoeal diseases, veritable degrees of host-parasite relationships leading to immunological adjustments, the modalities of treatment and management, as well as the behavioural patterns & life styles of the community including water sanitation, faeco-oral contamination, eating habits and movement of population. In the light of this, the present study of clinico-epidemiological presentations of diarrhoeas was conducted.

Methodology: A descriptive cross-sectional study was carried out during 6 months of 1st January to 30th June 2016 on 168 under five patients admitted in paediatric ward of Tertiary care hospital of Miraj, Dist. Sangli. Data was collected using predesigned proforma and analysed using statistical software.

Results and Conclusions: Out of the total 168 cases of diarrhoea, 54.76% were males and 45.24% were females. Maximum were infants, reported in January, from urban area, belonged to 4th socio-economic status as per modified B.G. Prasad's classification, practising hand washing, with illiterate mothers and labourer fathers, non-satisfactory surrounding cleanliness. About 22% reported positive epidemiological history. Frequency of loose motions was more than 10 per day in most of the patients. Also diarrhoea was not associated with blood or mucus in stool most of the patients. Majority of the cases had mild dehydration with no complications and treated with oral rehydrating solution. Zero mortality was seen in the study. Health education on preventive measures of diarrhoea should be given to community.

Keywords: Diarrhoea, under-five, clinicoepidemiological profile, Maharashtra.

Introduction

Acute diarrhoea is defined either as "passage of loose, liquid or watery stools, or 'altered

consistency and/or increased frequency of stools which may be associated with vomiting.'⁽¹⁾ Globally, acute diarrhoeal diseases account for about 17% of the deaths in children each year^(2,3) and are an even

greater cause of long lasting morbidity, especially with longer-term impact of early childhood diarrhoea on growth and development. ⁽⁴⁾ Acute gastrointestinal illnesses are amongst the most common diseases worldwide: ranging from mild annoyances to devastating, dehydrating illnesses that can kill within hours. In children less than 5 years old, attack rates range from 2-3 illnesses per child per year in developed countries to as high as 10 to 18 illnesses per child per year in developing countries. In Asia, Africa & Latin America, acute diarrhoeal illnesses are leading cause of morbidity in children with an estimated 1 billion cases per year. ⁽⁵⁾

A lot has been studied regarding diarrhoea which establishes beyond doubt that, there are geographic variations in clinico-epidemiological profiles of diarrhoeas. Such differences are largely due to the pathogenic variance, levels of endemicity of diarrhoeal diseases, veritable degrees of host – parasite relationships leading to immunological adjustments, the modalities of treatment and management, as well as the behavioural patterns & life styles of the community including water sanitation, faeco-oral contamination, eating habits and movement of population.

In the light of this, the present study of clinico-epidemiological presentations of diarrhoeas was planned & conducted at Government Medical College & hospital, Miraj. Objectives of the study were to find out the socio-demographic profile of study population and to determine certain risk factors associated with diarrhoea in the study population.

Methodology

It was a hospital-based descriptive cross-sectional study. It was carried out in 6 months, from 1st January to 30th June 2016. All the patients of acute diarrhoea who were admitted in Paediatric ward of the tertiary care hospital, Miraj were included in the study using inclusion and exclusion criteria.

Inclusion Criteria: (a) Children less than five years of age with acute diarrhoeal diseases admitted at the

tertiary care hospital. (b) Informants willing to participate in the study.

Exclusion criteria: (a) Children more than five years of age (b) Children, seriously ill or admitted in Neonatal Intensive Care Unit / Paediatric Intensive Care Unit (c) Medico legal cases (d) Informants unwilling to participate. Thus the total of 168 under-five patients of acute diarrhoea were included in the study. Data was collected using predesigned semi-structured questionnaire.

Materials used: Sphygmomanometer, thermometer, weighing machine, height measuring scale, questionnaire etc. Standardisation of all was ensured prior to the beginning of the study. The same instruments were used for the study and these instruments were checked for their proper calibration as and when required. Data was analysed using statistical software.

Ethical consideration: Prior permission was taken from the institutional ethical committee and also the individual consent was taken from the informants of the patients.

Results

Total 168 patients were included in the study.

Table No.1 Month wise distribution of the study population

Sr. No.	Month	No. Of patients
1	January	45
2	February	35
3	March	22
4	April	17
5	May	24
6	June	25
Total		168

The number of patients ranged from 17 to 45. The minimum number of admissions was in April 2016 while the maximum admissions were in January 2016. Average number of admissions per month was 28.

Table No.2 Age and gender wise distribution of the study population.

Sr. No.	Age in years	Male		Female		Total	
		No.	%*	No.	%*	No.	%*
1.	<1	27	29.35	21	27.63	48	28.57
2.	1-2	17	18.48	13	17.10	30	17.86
3.	2-3	12	13.04	08	10.53	20	11.90
4.	3-4	16	17.39	14	18.42	30	17.86
5.	4-5	20	21.74	20	26.32	40	23.81
Total		92	54.76	76	45.24	168	100.00

(* shows Group-wise percentages)

Males 92 (54.76%) were more in number than females 76(45.24%). Maximum cases were 48(28.57%) infants followed by 4-5 years of age group with 40(23.81%) of total 168. Infants were more in number in case of both males and females.

Table No. 3 Socio-demographic profile of the study population

S. N.	Variables	Numbers	Percentage	
1	Socio-economic status	Class I	1	0.59
		Class II	2	1.19
		Class III	46	27.38
		Class IV	62	36.91
		Class V	57	33.93
2	Residence	Urban	95	56.55
		Rural	73	43.45
3	Father's occupation	Labour	58	34.52
		Farmer	49	29.17
		Unemployed	38	22.62
		Employed	23	13.69
4	Mother's education	Illiterate & Primary	93	55.36
		Secondary and above	75	44.64
5	Hand washing practice in mother	Prior to eating only	9	5.36
		After defecation only	38	22.62
		Prior to eating & after defecation both	68	40.48
		No	53	31.55
6	Surrounding' Cleanliness	Satisfactory	76	45.24
		Non satisfactory	92	54.76
Total		168	100%	

In the tableno.3, Socio-economic status according to modified B.G. Prasad's Classification was applied. Approximately three-fourths of the patients belonged to lower (Class IV & V) socioeconomic class. The more number of people from urban area may be due to the fact that the hospital is situated in the urban area.

Fathers of maximum patients 58 (34.52%) were labourer by occupation.

The educational status of mothers is divided into two groups. Patients' mothers who were illiterate or had primary education constituted 55.36% (93 of 168). Those with secondary education or above were 44.64% (75 of 168). Patients' mothers who were illiterate or had primary education were significantly more (z=2.20) in number as compared to those with the educational status, secondary and above.

The operational definition of hand washing applied in the present study was, "Satisfactory hand

washing with sufficient soap or suitable antiseptic agent with plenty of water so as to wash and clean hands till the wrist joint." Practice of hand washing prior to eating food as well as after defecation was told by 68 (40.48%). Practice of satisfactory hand washing neither prior to eating food nor after defecation was found in 53 (31.55%).

The surrounding cleanliness was considered as per history obtained from the informants. Factual visits could not be made to the places. Surrounding cleanliness was reported to be satisfactory in 76 (45.24%) and non-satisfactory in 92 (54.76%) cases. The number of diarrheal cases was significantly more with non-satisfactory surrounding cleanliness ($X^2=6.75, p<0.001$).

Table No. 4 Clinico-epidemiological profile of study population

S.N.	Variables	No.	%	
1	Duration of loose motions before admission	<24 hours	30	17.86
		24-48 hours	77	45.83
		> 48 hours	61	36.31
2	Frequency of loose motions per day	3-5	38	22.62
		5-10	57	33.93
		> 10	73	43.45
3	Association of loose motions with blood or mucus	Blood only	3	1.79
		Mucus only	25	14.88
		Blood + Mucus	13	7.74
		No blood or mucus.	127	75.59
4	Causative history for diarrhoea	Similar complaints in family	5	2.98
		Exposure to contaminated source	4	2.38
		Outside eating or drinking	18	10.71
		History of diarrhoea in previous 2 months	9	5.36
		No causative history reported	132	78.57
		Dehydration		
5	Dehydration	Mild	99	58.93
		Moderate	43	25.59
		Severe	13	7.74
		No dehydration	13	7.74
Total :		168	100	

The above table no.4 shows the distribution according to duration for which patients had complaints before hospitalization or the delay in reporting time to the hospitals. In the present study it was observed that patients having duration of complaints for < 24 hours before hospitalization were 30 (17.86%), those having duration of complaints for 24-48 hours before hospitalization were 77 (45.83%) and those having duration of complaints for > 48 hours before hospitalization were 61 (36.31%). Maximum number of patients

(45.83%) had reported within 24 to 48 hours of loose motions.

It was observed that 43.45% of the cases had > 10 stools per day, 33.93% cases had 5-10 stools per day, and 22.62% had 3-5 stools per day.

Loose motion was not associated with blood or mucus in maximum patients, 127(75.59%).

The above table no.4 also shows the distribution of the diarrhoea patients according to the factors or history that may increase the risk of diarrhoea or may point towards the cause. It was observed that the history of similar complaints in other members was present in 5 (2.98%). Exposure to contaminated source was reported in 4(2.38%) cases; history of eating or drinking outside was present in 18(10.71%) patients [eating at public place was present in 8 (4.76%), Eating or drinking during travelling was reported by 10(5.95%)]. History of similar complaints of diarrhoea in previous two months was reported in 9(5.36%) cases.

In the present study it was found that dehydration due to diarrhoea was present in 92.26% of the total patients. The number of patients having no dehydration was 13 (7.34%). Mild dehydration was observed in 99 (58.93%), Moderate dehydration in 43 (25.59%) while Severe dehydration was observed in 13 (7.34%). Thus maximum patients were observed to have mild dehydration. There was no significant difference in the degree of dehydration present in male and female gender ($X^2 = 0.95$, $df = 3$, $P > 0.01$).

In the present study, complications like oliguria, anuria, and convulsions were observed in 6 (3.5% of 168) patients. While remaining 162 patients (96.5% of 168) did not have any complications at all. There was a significant difference ($X^2 = 9.40$, $p < 0.01$) between male and female gender with respect to presence of complications. The decreased number of complications may be probably due to the appropriate control of dehydration.

Patients were treated with Oral Rehydration Solution, intravenous fluids, antibiotics, probiotics and zinc supplementation. The antibiotics used were Metronidazole, Gentamycin, Cephalosporins, Doxycycline which were subsequently changed to

other antibiotic, if required after the culture-sensitivity wherever indicated.

In the present study it was observed that, number of patients who had hospital stay of <1 day was 17 (10.11%), 2 to 4 days was 110 (65.47%), 5to7 days was 30 (17.86%) and those with a hospital stay of >8 days was 11 (6.55%). The duration of hospital stay showed a wide range of 1 to 21 days. However maximum patients had a hospital stay for 2-4 days. The median hospital stay was for duration of 3 days with the mean of 3.67 days. (SD= 2.05).

The number of patients who were cured at discharge was 156(92.86%), discharged on request was 7 (4.16%), discharged against medical advice was 5(2.98%). Thus the overall outcome of the diarrhoea cases was good with 92.56% cured patients, and mortality 0%.

Discussion and Conclusion

This is a hospital based descriptive cross-sectional study which is carried out during 6 months from Jan.2016 to Jun.2016 in 168 under-five children to know the clinico-epidemiological profile of acute diarrhoeal cases admitted in paediatric ward of Government Medical College &Hospital, Miraj. Average number of cases was 28 per month. Maximum were infants. Males were more than females. Approximately three-fourth of the cases were belonging to the lower socio-economic status. Similar findings were obtained from the study by Kaisha N et al,⁽⁶⁾ Joshi CK et al⁽⁷⁾ and Fule PR et al.⁽⁸⁾ The more number of cases in lower socioeconomic group may be linked to the various factors like standard of living, poor health along with non sanitary surroundings. Patients' Mothers who were illiterate or had only primary education were significantly more in number than those with secondary education and above. Majority of the patients' fathers were farmers, labourers or unemployed.

Maximum were from urban area. The more number of patients from urban area may be due to the fact that the hospital is situated in the urban area. Kaistha N et al ⁽⁶⁾ also observed that majority of patients were from urban slums in hospital based

study in Chandigarh. The number of diarrhoea cases was significantly more with non-satisfactory surrounding cleanliness. In the study of Sur D et al⁽⁹⁾ carried out in Kolkata, diarrhoea was seen in residents of densely populated areas with common source of water supply and poor domestic and personal hygiene.

Maximum number of patients reported with the duration of complaints of 24 to 48 hours before hospitalization. In the present study it was observed that 43.45% of the cases had > 10 stools per day, 33.93% cases had 5-10 stools per day, and 22.62% had 3-5 stools per day. Srivastava K et al⁽¹⁰⁾ in their study of diarrhoea had observed that 37.27% of cases had more than 10 episodes of stools per day; nearly same proportion had 6 to 10 stools per day. In 26 to 36% cases, 3-5 stools were passed per day. Loose motion was not associated with blood or mucus in maximum patients, 127 (75.59%). Talan D et al⁽¹¹⁾ in their study found many cases of diarrhoea with blood in stools and these were generally attributed to *Escherichia coli*. De et al⁽¹²⁾ in their study observed that only 5.4% of the patients had liquid stools with mucus and blood.

Around 22% of the cases were reported to have positive epidemiological history as eating and drinking outside or similar illness in the family or similar attack in the last 2 months. Srivastava K et al⁽¹⁰⁾ in their study, had also found that 36.36% of the patients had similar complaints of loose motions in last 2 months.

Around 32% patients' mothers were not practicing the satisfactory hand washing prior to feeding the child or after defecation or cleaning the child. So there is a need of health education about the hand washing and its importance in the area. These activities should be promoted.

Maximum patients were observed to have mild dehydration. There was no significant difference in the degree of dehydration between males and females. Srivastava K et al⁽¹⁰⁾ in their study observed that, dehydration was present in 79.8% cases (mild in 27.7%, moderate in 29.09% and severe in 22.72%). De A et al⁽¹²⁾ in Mumbai observed moderate dehydration with diarrhoea in 53

patients (57.6%), 32 had severe dehydration with diarrhoea (34.8%) and seven had mild dehydration with diarrhoea (7.6%). Joshi CK et al⁽⁷⁾ found that, 46.2% children suffered from moderate dehydration and 35.4% from mild dehydration.

However Gascon J et al⁽¹³⁾ in their case control study on diarrhoea had detected dehydration in 11 out of 103 cases.

In the present study very few had complications and maximum were cured completely. So the outcome in acute diarrhoea patients was good with no mortality. It may be due to the fact that most of the deaths in diarrhoeal cases are due to the dehydration leading to complications while in this study, the patients were treated with appropriate control of dehydration. Mortality in patients of diarrhoea was reported in the study of Srivastava K et al⁽¹⁰⁾ & Snyder JD et al.⁽¹⁴⁾ In the study of Srivastava K et al⁽¹⁰⁾ there were 17 deaths out of 349 diarrhoea cases. Snyder JD et al⁽¹⁴⁾ mentioned that morbidity rates were found to be highest in the 6-11 month age group. In the hospital based study of Fule P R et al⁽⁸⁾ conducted in Solapur which included total 233 patients of diarrhoea during an epidemic, it was observed that none of the patients died. Thus it is observed that early reporting of the diarrhoea cases with appropriate treatment of dehydration can prevent the complications in diarrhoea patients. Also positive epidemiological history in the cases suggests that there is a lack of health education about the preventive measures for diarrhoea. So health education activities should be promoted regarding preventive measures like the personal hygiene, cleanliness of the surroundings, hand washing etc.

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