Original Research Article

A study of biochemical abnormalities among children suffering from Acute diarrhea

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Abstract

Background: The average incidence of diarrhea among under five children per year in most of the developing countries is 3.2 episodes of diarrhea per child per year and the mortality of 4.9/1000 episodes per year. Diarrhea alone results in nearly 21% of the all the death in the under five years' children. Diarrhea is defined as passage of 3 or more loose or watery stools in 24-hour period that would take up the shape of the container6. It is also defined as a recent change in consistency and character of stool with a frequency of 3 or more liquid stools per day. **Objective:** To assess the level of biochemical abnormalities among under five children admitted in a tertiary care hospital. **Materials and Methods:** A cross section study was conducted at Basaveshwara Medical College and Hospital From May 2018 to November 2018.All the children during the study period who were between the age group of 1 months to 5 years who were admitted in the pediatric ward with history of. diarrhea were included in the study. A total of 160 cases were included in this study. **Results:** Majority (55%) of the study subjects were in the age group of less than 1 years and 10% between 1-2 years and 35% in the age group of 3-5 years. The frequency of loose stools less than 3 episodes per day was seen in 19(12%), 107 (67%) had 3-10 episodes per day and 34 (21%) had more than 10 episodes of loose stools per day. The urea levels were less than 20 mg/dl in nearly 10(6%) of the subjects, 20-35 mg/dl in 110(69%) and > 35 mg/dl in nearly 40 (25%) of the subjects. The Creatinine level less than 0.4 mg/dl was seen in nearly 101(63%). **Conclusion:** Acute diarrhea in children is associated with high morbidity and mortality Most of the patients with transient hyponatremia and transient hypokalemia, treated with ORS. These patients did not show classical signs and symptoms of hyponatremia. and hypokalemia.

Key Word: Diarrhoea, Under five, Electrolytes, Biochemical

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INTRODUCTION

One of the major public health problem resulting in mortality and morbidity in the pediatric age group is diarrhea. Diarrhea results in approximately 1.5-2.5 million deaths per year in the under five years' age group.[1] The average incidence of diarrhea among under five children per year in most of the developing countries is 3.2 episodes of diarrhea per child per year and the mortality of 4.9/1000 episodes per year. Diarrhea alone results in nearly 21% of the all the death in the under five years' children.[2] In Indian health institutions, up to a third of pediatric admissions are due to diarrheal diseases and up to 17%of all deaths in indoor pediatric patients are due to diarrhea. The morbidity rates in terms of diarrheal episodes per year, per child under 5 years is about,1.7. The proportionate mortality due to diarrhea in 0-6 yrs. of age is 9.1 %.[3] Diarrhea is defined as passage of 3 or more loose or watery stools in 24-hourperiod that would take up the shape of the container6. It is also defined as a recent change in consistency and character of stool with a frequency of 3 or more liquidstools per day.[4] Acute watery diarrhea is one which begins acutely, lasts for less than 14 days with passage of frequent loose/watery stools without visible blood or mucous. More than 90% of acute diarrhea is due to infectious agents.[5] In addition, many time this number have long-term, lasting effects on nutritional status, growth, fitness, cognition, and school performance. Some studies have revealed the impact of diarrhea on growth. It is believed that diarrhea have a significant impact on growth due to reduction in appetite, altered feeding practices and decreased absorption of nutrients48.There was a marked negative relationship

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between diarrhea and physical growth and development of a child.[6,7,8] Electrolyte abnormalities are common in children with diarrhea. It may remain unrecognized and result in mortality and morbidity. Timely recognition, a high index of suspicion and thorough understanding of common electrolyte abnormalities is necessary to ensure their correction. The present work was undertaken to study the common electrolyte abnormalities in diarrhea and its impact on the mortality

MATERIALS AND METHODS

A cross section study was conducted at Basaveshwara Medical Colllege and Hospital From May 2018 to November 2018.All the children during the study period who were between the age group of 1 months to 5 years who were admitted in the pediatric ward with history of diarrhea were included in the study. A total of 160 cases were included in this study.

Cases with altered sensorium, Pneumonia and Gastroenteritis of more than 7 days' duration were excluded in the study.

Detailed clinical examination was done to look for thirsty, irritability, pinched look, sunken eyes, dry inner side of cheeks, abdominal distention, deep and rapid breathing, weak and thready pulse, falling blood pressure, reduced quantity of urine according to WHO dehydration assessment scale. All the laboratory investigations were done and data was collected in a predesigned, pretested and semi-structured questionnaire.

RESULTS

A total of 160 cases were analyzed in our study.

Table 1: Sociodemographic variables in the study subjects

Socio demographic variables		Frequency	Percentage
Age	< 1 years	88	55
	1-2 years	16	10
	3-5 years	56	35
Gender	Male	85	53
	Female	75	47
Place	Rural	109	68
	Urban	51	32
SES	I	11	7
	II	24	15
	III	29	18
	IV	51	32
	V	45	28
Weight	<5 kg	29	18
	5-10 kg	74	46
	10-15 kg	48	30
	>15 kg	9	6

Majority (55%) of the study subjects were in the age group of less than 1 years and 10% between 1-2 years and 35% in the age group of 3-5 years. Nearly 53% of the study participants were Male and 47% were females in our study. The rural population were 109(68%) in our study and 51(32%) from urban areas. The study population belonged to lower socioeconomic status were higher when compared to higher socio economic group. Nearly 29(18%) of the study population weighed less than 5 kg and 46 % were between 5-10kg and nearly 36% weighed more than 10 kgs.

Table 2: Clinical Signs and Symptoms among the subjects

		Frequency	Percentage
Dehydration	Present	67	42
	Absent	93	58
Abdominal Distension	Present	45	28
	Absent	115	72
Frequency of loose Stools /day	< 3 stools	19	12
	3-10 Stools	107	67
	>10 Stools	34	21

Dehydration was present in nearly 67(42%) of the study subjects during the time of admission and 45(28%) off them also presented with abdominal distension. The frequency of loose stools less than 3 episodes per day was seen in 19(12%), 107 (67%) had 3-10 episodes per day and 34 (21%) had more than 10 episodes of loose stools per day.

Table 3: Laboratory findings of the biochemical values

		Frequency	Percentage
Urea (mg/dl)	<20	10	6
	20-35	110	69
	>35	40	25
Blood glucose (mg/dl)	<65	36	22
	65-99	110	69
	>100	14	9
Total Bilirubin (mg/dl)	<1.3	152	95
	>1.3	8	5
Creatinine (mg/dl)	<0.4	101	63
	>0.4	59	37

The urea levels were less than 20 mg/dl in nearly 10(6%) of the subjects, 20-35 mg/dl in 110(69%) and > 35 mg/dl in nearly 40 (25%) of the subjects. Blood Glucose levels was less than 65 mg/dl in nearly 36 (22%), 65-99 mg/dl seen in 110(69%) and 14 (9%) of them had more than 100 mg/dl. The total bilirubin level of less than <1.3 mg/dl in nearly 152(95%) of the children. The Creatinine level less than 0.4 mg/dl was seen in nearly 101(63%).

Table 4: Mean laboratory values

	Blood glucose (mg/dl)	Total Bilirubin (mg/dl)	Urea (mg/dl)	Creatinine (mg/dl)	Na (mmol/L)	K+ (mmol/L)	Loose Stool per day	Vomiting episodes per day
Mean	82.3	1.2	33.5	0.8	139.5	4.3	6.2	2.6

The Mean Blood Glucose levels was 82.3, Total Bilirubin was 1.2, Mean urea level 33.5, Creatinine was 0.8. The mean Sodium levels was 139.5mmol/l and Potassium level was 1.3 mmol/l. The average episodes of loose stools per day was 8.2 and 2.6 episodes of vomiting was seen among the study subjects.

DISCUSSION

The Acute diarrheal disease is a major public health problem and a leading cause of pediatric morbidity and mortality. Among the children aged less than 5 years of age in developing countries the average episodes of loose stools were 3.2 episodes per child per year,[2] in our study the average episodes of stool per day was 6.2. The most common age group of children affected by diarrhea was more among the children less than 1 years of age in our study. The study findings of our study was similar to the study of Shah G S *et al* [9]and in the prospective study done in UK.[10] Rebecca Oketcho *et al*[11] and Shah G S *et al*[9] also showed more male children than female children, which was similar to our study findings. The signs and symptoms of dehydration was seen in nearly 42 % of the study group, in the study done by Begum JA *et al*[12] and Wathen *et al* 13the percentage of children with dehydration were almost comparable with our study findings. In our study nearly 69% of children had normal glucose levels which is similar to the study findings of Subba Gangaraj *et al.*[14] The urea levels were within normal limits was seen in nearly 69 % of the children and nearly 25 % of them had increased urea levels. In the study done by K R Purohit *et al*[15] nearly 53 % of the children had increased both urea and creatinine levels. The mean sodium levels in our study were similar to the study findings of Subba Gangaraj[14] and Shah G S *et al.*[9] The Potassium levels in our study were similar to the study findings of K R Purohit .[15]

CONCLUSION

Acute diarrhea in children is associated with high morbidity and mortality Most of the patients with transient hyponatremia and transient hypokalemia, treated with ORS. These patients did not show classical signs and symptoms of hyponatremia. and hypokalemia. Like any other electrolyte abnormalities which occurs in conditions other than diarrhea, are basically asymptomatic and does not require aggressive correction of electrolytes. Early treatment with ORS and ant motility drugs has been associated with improvement in the children, to prevent morbidity and mortality. They do very well with ORS and fluid correction as recommended by W.H.O.

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