CLINICAL AND BIOCHEMICAL PROFILE OF ACUTE GASTROENTERITIS IN CHILDREN IN NEPAL MEDICAL COLLEGE TEACHING HOSPITAL

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ABSTRACT

The objective of this study was to find out the clinical and biochemical profile of acute gastroenteritis in children. This was a prospective study carried out in Nepal Medical College Teaching Hospital. Seventy-eight cases of acute gastroenteritis admitted in pediatric ward of NMCTH were studied. Most of the cases (48.7%) were in the age group 1-5 years. Loose stool, vomiting (58.9%), fever (48.7%), decreased urine output (24.3%) were the main presenting features. According to WHO classification, 32.1% had no dehydration, 55.1% had some and 12.8% had severe dehydration. Hyponatremia and hypokalemia was seen in 39.7% and 29.5% respectively. High level of serum urea was seen in 15.1 % and high serum creatinine was seen in 7.5%.

KEYWORDS

Acute gastroenteritis, dehydration, electrolyte imbalance

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INTRODUCTION

Diarrheal diseases are one of the leading causes of morbidity and mortality in children worldwide, causing 1 billion episodes of illness and 3-5 million deaths annually. [1] Prevalence of diarrheal diseases in Nepal has decreased in last 20 years. Prevalence of diarrheal diseases in urban and rural area was 23.8 and 27.7 in 1996 where as it was 11.5 and 11.9 in 2006 respectively.[2] The two most risky consequences of diarrhea are malnutrition and death. Dehydration is the major cause of death in acute diarrhea. Fluid and electrolyte balance is the main therapy in acute diarrhea. Oral rehydration solution is still the choice of treatment for children with no or some dehydration. Intravenous fluid therapy is reserved for treatment of children with severe dehydration.[3]

The aim of this study was to evaluate symptoms, severity and biochemical parameters like urea, creatinine and electrolytes in children presenting with acute gastroenteritis.

MATERIALS AND METHODS

This was a prospective study done in Nepal Medical College Teaching Hospital. All cases of acute gastroenteritis admitted in the pediatric ward of NMCTH from April 2013 to September 2013 were studied. Patients admitted with the diagnosis of acute gastroenteritis were taken for the study. Clinical features were recorded and degree of dehydration assessed according to WHO.

Of the total 88 cases of acute gastroenteritis admitted during that period, only 78 cases were taken for the study as serum electrolytes were done only in those cases. Thus 10 cases were excluded from the study. Data like age, sex, symptoms, duration, severity of dehydration (according to WHO) were recorded. Investigations that were included in the study were stool routine and microscopic examination, serum sodium, serum potassium, urea, and creatinine. All the data were recorded and filled up in a preformed form and analyzed accordingly.

RESULTS

Out of 78 cases of acute gastroenteritis admitted in the pediatric ward of Nepal Medical College Teaching hospital, 44 (56.4%) were male and 34 (43.6%) were female. Maximum numbers of patients (48.7%) were in the age group 1-5 years followed by less than 1 years. (Table1). Forty-five children (57.6%) presented with symptoms for 2-5 days. History of loose stool for less than two weeks was present in all these children. The other clinical features present in these children were vomiting, fever, decreased urine output and altered sensorium. Vomiting was seen in 46 (58.9%) children. Fever (48.7%), decreased urine output (24.3%), altered mental state (10.2%) and convulsion (3.8%) were also seen in these children (Fig.1). According to the WHO classification, 25 (32.1%) had no signs of dehydration, 43 (55.1%) had some and 10 (12.8%) had severe signs of dehydration. (Table 2)Hyponatremia was seen in 31(39.7%) children and hypokalemia in 23 (29.5%)

Table 1: Age wise distribution of children with acute gastroenteritis

Age	Number	Percentage
<1 year	21	26.92
1-5 years	38	48.72
>5 years	19	24.35

Table 2: Degree of dehydration according to WHO

Degree of dehydration	Number	Percentage
No dehydration	25	32.05
Some dehydration	43	55.12
Severe dehydration	10	12.82

Table 3: Serum sodium level in children with acute gastroenteritis

Serum sodium level	Number	Percentage
<135 mEq/L	31	39.74
135- 146 mEq/L	45	57.69
>146 mEq/L	2	2.56

Table 4: Serum potassium level in children with acute gastroenteritis

Serum potassium level	Number	Percentage
<3.5 mEq/L	23	29.48
3.5-5.5 mEq/L	51	65.38
>5.5 mEq/L	4	5.12

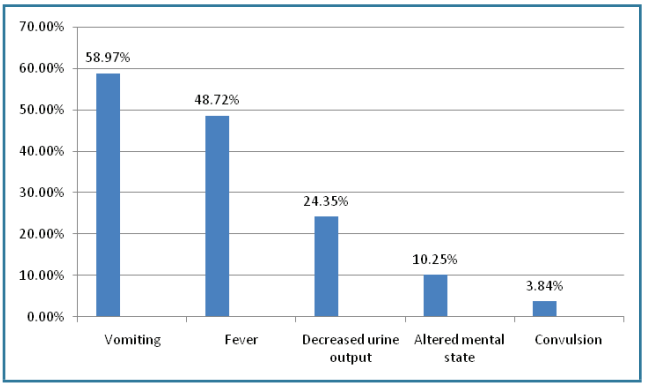

Fig.1: Bar diagram showing clinical presentation of acute gastroenteritis in children

children. (Table 3 and 4). Serum urea was high in 15.1% and high creatinine was seen in 7.5% cases. Stool routine and microscopic examination revealed fat droplets indicating viral etiology in 35.9% cases. Stool routine and microscopic examination showed dysentery in 15.28%. *Entamoeba histolytica* was seen in 16.66% cases whereas *Giardia lamblia* was seen in only 1.28 %. Cholera was isolated in 3.85%. Majority of children (69.2%) stayed in hospital for 2-5 days.

DISCUSSION

Acute gastroenteritis is one of the commonest causes of hospital admission in children. Major consequences of acute gastroenteritis are dehydration and electrolyte imbalance. In our study of 78 children, 56.4 % were male and 43.6% female. This finding was similar to the study done by Rebella *et al* and Bottaro *et al* where 50% and 51% were male respectively.[4,5] Beside loose stool, 58.97% had vomiting, 48.72% had fever and 24.35% had decreased urine output in our study. Bottaro *et al* in their study of 1140 children reported vomiting and fever in 34.6% and 27.5% respectively.[5] In yet another study, vomiting was seen in 25.9% children presenting with acute gastroenteritis with dehydration. [6] In our study, 32.05% had no dehydration, 55.12% had some and 12.82% had severe dehydration. Different studies have found severe dehydration in only 2% and 0.35% .[4, 5] The high percentage of severe dehydration in our study could be because of the fact that some children are brought to hospital only when they become severely ill. Hyponatremia was seen in 39.74% and hypokalemia in 29.48% children in our study.15.09% had high serum urea and 7.54% had high creatinine level. KC *et al* in their study done at Kathmandu Medical College in adults with acute gastroenteritis found hyponatremia in only 2.9%, hypokalemia in 26.47% and high urea and creatinine level in 23.40% and 8.82% respectively.[7]Studies have shown that serum urea and bicarbonate levels are helpful in assessing dehydration.[8, 9] However, some studies found out that measurement of the magnitude of BUN concentration is not an accurate method for assessing the hydration status of children with dehydration due to acute gastroenteritis.[10]In our study, 35.89% had only fat droplets in stool routine and microscopic examination indicating viral etiology. Most of the cases of acute gastroenteritis in children worldwide are viral.[1,3,11] In our study, 15.38% had bacillary dysentery. *Entamoeba istolytica* was the most commonly isolated protozoa (16.66%). *Giardia lamblia* was seen in only one case 1.28%). This was in contrary to the study done by Joshy *et al* in Manipal College of Medical Sciences, Pokhara where *Giardia lamblia* was the most commonly isolated protozoan parasite (73.4%) followed by *E histolytica* (24.4%).[12] There were 3 cases of cholera (3.85%). All 3 cases were sensitive to ciprofloxacin. This antibiotic susceptibility was comparable to the study done by Shrestha *et al* in which *Vibrio cholera* was 100% sensitive to ciprofloxacin, ampicillin, tetracycline and erythromycin.[13] Various studies have shown the benefit of oral rehydration solution in management of mild to moderate dehydration caused by acute gastroenteritis.[14-16]

Intravenous fluid can be reserved for cases with severe dehydration and electrolyte imbalance. Acute gastroenteritis with dehydration is one of the important causes of hospital admission in children. Hyponatremia and hypokalemia are more common in these patients. These parameters must be checked in all patients with acute gastroenteritis especially those presenting with features of dehydration. Though it is not a common practice to look for bicarbonate level in our setup, it would be better to check serum bicarbonate value in those presenting with severe dehydration.

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