

SERUM UREA, CREATININE AND ELECTROLYTE STATUS IN PATIENTS PRESENTING WITH ACUTE GASTROENTERITIS

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ABSTRACT

The present study was undertaken to estimate the serum urea, creatinine and electrolyte status of patients presenting with acute gastroenteritis. Sixty patients who presented to Kathmandu Medical College and Teaching hospital from 15 June to 15 July 2005 with acute diarrhea with or without associated vomiting, causing dehydration severe enough to require hospital admission were investigated for serum urea, creatinine and electrolyte level. Out of 60 patients investigated, serum sodium and potassium level were available for 34 patients. Only one (2.9%) patients had sodium level below 135mEq/l, thirty two (94.11%) had sodium level between 135-146 mEq/l and one (2.9%) had sodium level above 146mEq/l. Similarly 9 (26.47%) patients had potassium level below 3.5mEq/l, 22 (64.70%) patients had potassium level between 3.5-5 mEq/l and 3 (8.82%) patients had level above 5 mEq/l. Serum urea and creatinine level were available for 47 patients. 36 (76.59%) patients had serum urea level between 15-45mg/dl and 11 (23.40%) patients had urea level above 45 mg/dl. 35 (74.46%) patients had serum creatinine level between 0.5-1.4 mg/dl and 12 (25.53%) had serum creatinine level above 1.4 mg/dl. In this study hypokalaemia was noticed more than hyponatremia and significant number of patients also showed increased level of serum urea and creatinine. Therefore, serum urea, creatinine and electrolytes should be closely monitored in patients with acute gastroenteritis.

Key Words: Acute gastroenteritis, urea, creatinine, electrolyte.

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INTRODUCTION

Despite reductions in mortality worldwide, diarrhea still accounts for more than 2 million deaths annually¹ and is associated with impaired physical and cognitive development in resource-limited countries.² In the United States an estimated 211 million to 375 million episodes of acute diarrhea occur each year (91.4 episodes per person per year); such episodes are responsible for more than 900,000 hospitalization and 6000 deaths annually.^{3,4}

Acute diarrhea, defined as an increase frequency of defecation (three or more times per day or at least 200 grams of stool per day) lasting less than 14 days, may be accompanied by nausea, vomiting, abdominal cramping, clinically significant symptoms, or malnutrition.⁵ Acute diarrhea is among the most common problems encountered by the physician in the developing countries. Serum electrolytes are commonly ordered in the evaluation of patients with acute diarrhea. Complications develop exclusively from the effect of volume and electrolyte depletion and include renal failure due to acute tubular necrosis in some cases.

The aim of this clinical study was to evaluate prospectively serum level of urea, creatinine and electrolytes in patients presenting with acute gastroenteritis.

MATERIALS AND METHODS

Sixty patients who presented to Kathmandu Medical College and Teaching hospital from 15 June to 15 July, 2005 with acute diarrhea with or without associated vomiting, causing dehydration severe enough to require hospital

admission were included in the study. All patients were assessed clinically and blood samples were sent to laboratory for serum level of urea, creatinine and electrolytes at the time of admission before patients were hydrated with intravenous isotonic saline.

RESULTS

Out of sixty patients investigated for acute diarrhea, 38 (63.3%) were male and 22 (36.67%) were female. Out of 60 patients investigated, serum sodium and potassium level were available for 34 patients. Only one (2.9%) patients had sodium level below 135mEq/l, thirty two (94.11%) had sodium level between 135-146 mEq/l and one (2.9%) had sodium level above 146mEq/l. Similarly 9 (26.47%) patients had potassium level below 3.5mEq/l, 22 (64.70%) patients had potassium level between 3.5-5 mEq/l and 3 (8.82%) patients had level above 5 mEq/l as shown in Table I.

Serum urea and creatinine level were available for 47 patients. 36 (76.59%) patients had serum urea level between 15-45mg/dl and 11 (23.40%) patients had urea level above 45 mg/dl. 35 (74.46%) patients had serum creatinine level between 0.5-1.4 mg/dl and 12 (25.53%) had serum creatinine level above 1.4 mg/dl as shown in Table II.

DISCUSSION

Although differential diagnosis of infectious diarrhea is broad, the clinical history can help guide the clinician towards the appropriate evaluation. Viruses are the major

Table I: Serum sodium and potassium level of patients (n=34)

Serum sodium level	
Serum sodium level	Number of patients (%)
Less than 135 mEq/l	1 (2.9)
135-146 mEq/l	32 (94.11)
More than 146 mEq/l	1 (2.9%)
Serum potassium level	
Serum potassium level	Number of patients (%)
Less than 3.5 mEq/l	9 (26.47)
3.5-5 mEq/l	22 (64.70)
More than 5 mEq/l	3 (8.82)

Table II: Serum urea and creatinine level of patients (n=47)

Serum urea level	
Serum urea level	Number of patients (%)
Less than 15 mg/dl	0 (0)
15-45 mg/dl	34 (74.59)
More than 45 mg/dl	11 (23.40)
Serum creatinine level	
Serum creatinine level	Number of patients (%)
Less than 0.5 mg/dl	0 (2.17)
0.5-1.4 mg/dl	33 (64.70)
More than 1.4 mg/dl	12 (8.82)

cause of diarrhea worldwide. When diarrhea is a result of infection, invasive bacteria is the most likely cause with features of large volume watery stool and diffuse abdominal cramps.⁶ Patients with severe dehydration should have blood drawn for complete blood count, serum urea, creatinine and electrolytes, Extreme dehydration can be evaluated by serum electrolytes. Serum urea and bicarbonate can be helpful in estimation of fluid deficit independently from serum sodium.⁷ Quantification of serum electrolytes in severely dehydrated children or whose history and physical findings are inconsistent with pure diarrheal episode is helpful, though most diarrheal episode in well nourished infants leads to isotonic dehydration.⁸

Stool routine examination and microscopic examination can support empirical antibiotic therapy⁹⁻¹¹ and is cost effective.¹²⁻¹⁵ Stool culture and sensitivity is recommended but not necessary as yield is only 2%.^{6,9,10,11,16} Primary therapy is oral rehydration solution (ORS). But patient should be hydrated with intravenous isotonic saline or ringer lactate solution in severe dehydration, as oral intake in severe dehydration will not be adequate to overcome dehydration because the profuse watery diarrhea represents impairment of normal interstitial absorption.

CONCLUSION

In this study hypokalaemia was noticed more than hyponatremia and significant number of patients also showed increased level of serum urea and creatinine. Therefore, serum urea, creatinine and electrolytes should be closely monitored in patients with acute gastroenteritis.

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