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Study of clinical profile in acute gastroenteritis patients with special reference to dyselectrolytemia

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Abstract
Background: Dyselectrolytemia is most common complication seen in acute gastroenteritis which leads to long term morbidity and sometimes mortality which is easily preventable by simple measures.
Aims & Objective: To study clinical presentation of acute gastroenteritis with pattern of dyselectrolytemia and arterial blood gas analysis and response to therapy
Study Design: Prospective observational study
Material &Methods: All patient in age group 1 month to 12 years admitted for acute gastroenteritis over period of 2 years in Paediatrics Department of Tertiary care centre were included in this study.
Results: Increased frequency of stool and vomiting were most common presenting symptoms while most common electrolyte imbalance in study was hyponatremia followed by hypokalaemia In ABGA analysis severe metabolic acidosis was found in most of cases.
Conclusion: ORS usage promotion in mild and moderate cases of dehydration is the best way for preventing severe dehydration and dyselectrolytemia .Zinc has established role in decreased frequency and total duration of acute gastroenteritis.

Keywords: Acute gastroenteritis, dyselectrolytemia, ORS

1. Introduction
Acute diarrhoeal disease is a major public health problem and a leading cause of paediatric morbidity and mortality. In Indian health institution up to one third of paediatric admission are due to diarrhoeal disease and 17% of all deaths in indoor paediatric patient are due to diarrhoea [1]. Diarrhoea is defined as passage of 3 or more loose or watery stools in a 24 hours period [2]. Acute watery diarrhoea is one which begins acutely, lasts for less than 14 days with passage of frequent loose watery stools without visible blood or mucous [2]. Diarrhoea is caused by increased intestinal secretion and decreased absorption due to impaired epithelial transport process, osmotic diarrhoea due to incompletely absorbed nutrients. Most of the death from acute infectious diarrhoea result from excessive fluid that result in dehydration and acidosis. Electrolyte imbalance are common in children with diarrhoea, timely recognition, a high index of suspicion and thorough understanding of common abnormalities is necessary to ensure their correction.

2. Material &Methods
The Prospective observational study was conducted at the department of Paediatrics in Tertiary Care Centre over period of 2 years which included 150 patient which presented with acute gastroenteritis with dyselectrolytemia. Patient age group was 1 month to 12 year. Detailed clinical history including associated symptoms was noted and history regarding urine output in last 24 hours was noted. Systemic examination of patients was done with special attention to severity of dehydration, sensorium of patient, grade of PEM and finding were noted in preformed proforma. Laboratory investigation like Hemogram, Sr. Sodium, Sr. Potassium, Sr. Creatinine and Sr. Urea and ABGA analysis were done. All the patients were treated according to WHO guidelines for treatment of diarrhoea. The electrolyte abnormalities and acid base abnormalities detected were treated.

3. Results

Presenting symptoms at time of admission

Symptom	No	percentage
Increased frequency of stool	150	100%
Vomiting	108	72%
Fever	70	47%
Increased thirst	16	11%
Altered sensorium	6	4%
Tachypnoea	102	68%
Dry tongue/mucosa	85	57%
Skin pinch goes back slowly/very slowly	65	43%
Sunken eyeball	35	23%
Tachycardia	20	13%

Types of dehydration

Types of dehydration	No	Percentage
Isonatremic	55	37%
Hyponatremia	93	62%
Hypernatremic	2	2%

Electrolyte disturbances age wise

Electrolyte	<1 year	1-5 years	>5 years
Hyponatremia	24(16%)	45(30%)	18(12%)
Hypernatremia	1(0.6%)	1(0.6%)	0
Isonatremia	26(17.3)	22(14.6%)	13(8.6%)
Hypokalemia	31(20.6%)	18(12%)	20(13.3%)
Normal potassium	23(15.3%)	40(26.6%)	18(18%)

PH changes in severe dehydration

Ph range	No	Percentage
<7.2	4	(14%)
7.2 – 7.35	22	(79%)
7.35-7.45	2	(7%)

In present study ,incidence of AGE was highest in age group of < 2 year (69%) followed by 2-5 year (17%) and >5 year (14%).Incidence of AGE in Male is 54% and Female 46%.Higher incidence of AGE found in May- July. Risk factor associated with AGE is Open field defecation (21%) followed by failure to hand wash before taking feed (14%). Normal sensorium was found in 16% patient while 64% patient were irritable. In present study some dehydration was most common finding. IAP classification was used for grading of malnutrition, majority of patient were in PEM grade 1 and 2(44%) [3].

Out of 13 patient who develop abdominal distension 50% patient have potassium level between 3 meq/dl to 3.5 meq/dl and 42% had potassium level <3 meq/dl. 18% of patient had high blood urea value, which are probably due to pre renal acute injury secondary to severe dehydration.20% of patient had high blood creatinine value, which are probably due to pre renal acute injury secondary to severe dehydration. In present study 17% cases of severe dehydration had severe reduction in bicarbonate level.

All the patient were treated according to standard protocol, 92% of hyponatremia and 81% of hypokalaemia was corrected within 24 hours of starting the therapy. Very few percent of dyselectrolytemia required treatment for 48 hours. In a case of diarrhoea electrolyte disturbances are mainly due to fluid deficit and loss of electrolyte in stool. So electrolyte are rapidly corrected soon after fluid was started as seen in present study.

4. Discussion

In present study incidence of gastroenteritis was 2.82% which is comparable to study of Ukey Ujawala *et al.* [4] which was 1.92%. and Behra S K [5] is 11.3%.Arora and Poltowalla *et al.* [6] study shows incidence of AGE in <2 years to be 72% comparable to present study incidence (69%).other study like Sood *et al.* [7] has incidence of 91% and Joshi CK *et al.* [8] has 73.8% .

Increased frequency of stool is most common presentation followed by vomiting. Present study observed 72% case with vomiting which is comparable to study conducted by Naruka BS *et al.* [9] (62.5%).

In present study 79% patient had malnutrition. S.K. Behara *et al.* [10] and Deivanayagam *et al.* [11] observed malnutrition in 89% patient. Electrolyte disturbances in PEM grade 3&4.Samadi Ar *et al.* [12] observed isonatremic dehydration in 72% cases of AGE, while in present study hyponatremia dehydration (62%) was predominant type of dehydration. In present study, 51% patient were observed with hypokalemia, while study conducted by Singh *et al.* observed 24% of patient with hypokalaemia.

5. Conclusion: Diarrhoeal disorders can be easily prevented by hand washing, proper disinfection of water, proper drainage system and defecation facility. Proper nutrition is very important component for management as well as prevention of diarrhoea. ORS usage promotion in mild and moderate cases is best way for preventing severe dehydration and dyselectrolytemia. Zinc has established role in decreased frequency and total duration of diarrhoea. ORS for no dehydration and some dehydration and intravenous fluid therapy for severe dehydration is still the mainstay for treating diarrhoea and associated electrolyte and acid base disturbances.

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