

A Clinico Epidemiological Study on Various Diseases Presenting With Diarrhea at an Infectious Diseases Hospital

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Abstract: Acute diarrhea constitutes a major cause of morbidity and mortality, especially among the very young, very old, and immunocompromised patients globally 1. Common causes include infections especially viruses. Noninfectious causes of diarrhea include: inflammatory bowel disease, irritable bowel syndrome, ischemic bowel disease and partial small bowel obstruction, pelvic abscess in the recto sigmoid area, fecal impaction, carcinoid syndrome, food allergies, the ingestion of poorly absorbable sugars such as lactulose, and acute alcohol ingestion. Other clinical conditions that can lead to sporadic or endemic episodes of acute diarrhea include malaria, hepatitis A-E, Enteric fever, Dengue fever, HIV infection, food poisoning, ulcerative colitis, Crohn's disease, Celiac disease, colonic polyps, Colorectal cancer, necrotizing Enterocolitis, Diverticulitis, appendicitis and diabetic enteropathy 2. In the present study, conducted over a period of six months from January to June 2016 involving 1658 cases admitted with diarrhea, an attempt has been made to evaluate clinically and epidemiologically the different clinical conditions which presented with diarrhea as one of the symptoms and tried to elicit a relation with severity of the disease in terms of morbidity and disease outcome.

Keywords: Diarrhea, malaria, hepatitis, Enteric fever, dengue fever, acute diarrheal disease (ADD)

I. Introduction

Normal bowel frequency ranges from three times a day to three times a week in healthy population. Acute diarrhea is defined as three or more stools per day of a different form from the normal, lasting for less than 14 days³. Though diarrhea is often caused by infectious agents, there are other conditions that can present with diarrhea or at some stage of the disease develop diarrhea². Causes of diarrhea with acute onset include enteric infections including food poisoning, extra intestinal infections, drug-induced, antibiotic-associated, laxatives, antacids that contain magnesium, opiate withdrawal, food allergies or intolerances, disorders of digestive/absorptive processes, chemotherapy or radiation-induced enteritis, surgical conditions-acute appendicitis, vitamin deficiencies-niacin deficiency, folate deficiency, vitamin toxicity-vitamin C, niacin, vitamin B3, ingestion of heavy metals or toxins (eg. copper, tin, zinc) and ingestion of mushrooms. Infectious causes of acute diarrhea in developed countries include viruses-rotavirus, noro virus, calici virus, astro virus, enteric-type adenovirus, bacteria-Campylobacter jejuni, Salmonella, E. coli, Shigella, Y. enterocolitica, C difficile, Vibrio parahaemolyticus, V.cholerae, Aeromonas hydrophila, parasites-Cryptosporidium, Giardia lamblia.

After procuring clearance from Institutional ethics committee, the present study was done at SRRIT&CD, Hyderabad, over a period of six months from January to June 2016 with the following

aims and objectives-

1. Identify various infectious agents causing acute infective diarrhea
2. Assess the clinical profile of patients admitted with ADD
3. Assess the morbidity in terms of severity of dehydration and electrolyte imbalance
4. Study the role of co morbid conditions-coronary artery disease, acute renal failure, chronic kidney disease, hypertension and diabetes as potential mortality related risk factors
5. Identify diseases presenting with diarrhea as an initial symptom.

II. Materials and methods

All patients of acute diarrheal diseases admitted at Sir Ronald Ross institute of tropical and communicable diseases, Hyderabad, of all ages and gender from January to June 2016 were included in the study.

Patient information was recorded in the prescribed proforma which included name, age, sex, occupation, address, Op/Ip number, date of admission and discharge.

History of illness included symptoms, number of motions passed/day, consistency, presence/absence of mucus and blood, associated with vomitings/ fever/ pain abdomen, duration of illness, history of consumption of outside/ contaminated food, similar complaints in the family/ neighborhood, use of drugs and co morbid illnesses.

Clinical examination included noting the built of the patient, vitals which included pulse rate, blood pressure, respiratory rate, signs of dehydration and grading- mild, moderate or severe.

Inclusion criteria;

1. Patients admitted with ADD
2. All ages
3. All genders

Exclusion criteria;

1. Chronic diarrhea
2. Malabsorption syndromes
3. Inflammatory bowel disease-ulcerative colitis, crohn’s disease
4. Motility disorders-irritable bowel syndrome

Laboratory investigations included-

1. Stool examination: 2-5 ml/1gm approximately collected in a sterile container and immediately transported to the Microbiology department for microscopy, culture and sensitivity
2. Blood: 2-5 ml collected aseptically for CBP, ESR, TLC, Blood urea, creatinine, electrolytes and for rapid tests for HIV 1 & 2
3. Renal function tests, LFT, Smear for MP, Widal test, NS1 antigen and IgM antibody for Dengue fever, X ray chest and ECG as required

All admitted patients received IVfluids-Ringer lactate & Normal saline as per standard dehydration management protocol, antibiotics and supportive care.

III. Results

The study was conducted at SRRIT&CD on all patients admitted with ADD from January to June 2016 either from outpatient department or shifted from other wards with different clinical diagnosis subsequent to developing diarrhea.

Total number of patients who were treated for diarrhea was 1658, out of which 1024 were females and 634 males. Month and age wise distribution of patients is shown in table 1.

Table 1 showing age wise distribution of diarrhea cases

S No	Month	males	Females	5-14yrs	15-54yrs	55yrs & above
1	Jan	87	156	17	182	44
2	Feb	150	150	24	174	48
3	Mar	74	130	14	151	39
4	Apr	114	175	35	231	43
5	May	145	206	38	282	51
6	June	118	153	18	229	38
7	Total	688 (42%)	970 (58%)	146	1249	263

Out of 1658 cases, 982 (59%) patients had mild, 476 (28.7%) had moderate and 200 (12.3%) had severe dehydration.

Three hundred and fifty six patients suffered from dyselectrolemia.

In the present study, 90.4% of patients presented with infective ADD (table 2 : bacterial + viral diarrhea) while 9.6% were admitted with provisional diagnosis of various conditions which included Viral hepatitis (1.5%), Enteric fever (5.6%), Malaria (2.4%) and Dengue (0.12%) while 0.1% were found HIV positive, 0.3% accounted for food poisoning. Bacterial isolates included *V.cholerae* & *Shigella flexneri*.

Table 2 showing etiology of diarrhea

S No	Mode of presentation	% of cases
1	Bacterial diarrhea	40.02
2	Viral GE	50.45
3	Viral hepatitis	1.5
4	Malaria	2.4
5	Dengue fever	0.12
6	Enteric fever	5.6
7	HIV	0.1%
8	Food poisoning	0.3%

morbid conditions (table 3) seen were acute renal failure (24), hypertension (109), diabetes mellitus (74), coronary artery disease (15).

Table 3 showing gender wise co morbid conditions and deaths

S No	Co morbid condition	Males	Females	Total	Deaths
1	ARF	17	7	24	Nil
2	Hypertension	80	39	109	03
3	Diabetes	40	34	74	Nil
4	CAD	14	01	15	01

patients recovered with appropriate treatment except four who died, two male patients aged 45yrs and 52yrs of myocardial infarction and two, one female aged 72yrs and one male aged 56yrs due to congestive cardiac failure.

IV. Discussion

Worldwide, acute diarrhea constitutes a major cause of morbidity and mortality, especially among the very young, very old, and infirm ¹ affecting about 1.7 to 5 billion patients per year ^{2, 3}. It is most common in developing countries, where young children get diarrhea on average three times a year ³. Total deaths from diarrhea are estimated at 1.26 million in 2013 ⁴. In 2012, it was the second most common cause of deaths in children younger than five (0.76 million or 11%) ^{3, 4}.

Frequent episodes of diarrhea are also a common cause of malnutrition and the most common cause in those younger than five years of age ². Other long term problems that can result include stunted growth and poor intellectual development ⁵.

Diarrhea is more prevalent in adults and females at extremes of age and in travelling men ² as was observed in the present study. Nine hundred and seventy (58%) females were affected and the age group most affected was 15-54 (table 1) in the present study.

Most patients (59%) suffered from diarrhea alone or associated with fever and mild dehydration.

The stools were watery (70%), semisolid (30%), associated with mucus(29%).

Explosive diarrhea was present in (26%).

The samples that were watery and odorous yielded *V.cholerae* on culture (0.2%).

Moderate dehydration was observed in 29% of patients while severe dehydration with electrolyte imbalance was seen in 12%.

Dyselectrolyemia was additionally observed in 9.4% of patients with moderate and severe dehydration.

While microscopy findings were positive in 55% of stool samples, culture was positive in only 41%.

Forty nine percent of stool samples failed to show any infective agents on routine testing.

Although infectious agents are by far the most common cause for sporadic or endemic episodes of acute diarrhea, one should not dismiss other causes that can lead to the same presentation ².

In the present study it was observed that certain co morbid conditions contributed to morbidity.

Twenty four patients in the age group 15-54 yrs had acute renal failure, 17 males and 7 females. Diarrhea is known to be one of the symptoms of end stage renal disease ⁶. These patients were later shifted to nephrology department.

Mild to moderate Hypertension was noted in 109 patients; 80 males and 39 females in the age group 15-54 and >54yrs. 4 patients who had uncontrolled hypertension showed ECG changes of cardiomyopathy; one female aged 72yrs and one male aged 56 yrs died of congestive cardiac failure while two male patients aged 45 and 52 yrs died of myocardial infarction .

Stool examination failed to reveal any significant findings in these 109 patients. It is possible that they could have suffered from diarrhea associated with use of antihypertensive ⁷.

74 patients had Diabetes; 40 males, 34 females. It is known that about 22% of people with diabetes experience frequent diarrhea⁸. Neuropathy may be a factor; another possible reason could be sorbitol, a proven potent laxative in amounts as small as 10 grams and is often used as a sweetener in diabetic foods ⁸. However, no such history was elicited in the present study and all patients recovered.

In the present study, 2.4% of cases presented symptoms and signs of Malaria. The reported incidence of diarrhea during malaria, especially in algid type, varies from 5 to 38% ⁹.

Dengue fever, which normally manifests with sudden onset of severe headache, chills, pain upon moving the eyes, and low backache, can also atypically present with diarrhea and gastritis associated with abdominal pain, nausea and vomiting ¹⁰ as was observed in 0.12% of patients in the present study who presented with mild diarrhea. All recovered without complications.

15 patients, 14 males and 1 female aged >54 yrs with CAD and on medication were admitted with ADD out of whom all recovered except one male aged 58yrs who died on the within one hour of admission ¹¹.

5.6% of cases admitted with provisional diagnosis of Enteric fever had diarrhea as presenting symptom. Early symptoms of enteric fever include fever, general ill-feeling and abdominal pain. High fever (103°F, or 39.5°C) or higher and severe diarrhea occurs as the disease gets worse¹². All patients in the study were discharged on recovery.

About 1.5 % of the patients admitted for viral hepatitis and tested positive for hepatitis by rapid immunochromatography tests had diarrhea as a presenting symptom. Of these, 0.72% was HAV positive, 0.5% for HCV and 0.28 for HBV^{13, 14, 15}.

V. Conclusions

Acute diarrhea is a common problem worldwide, with high morbidity and mortality in high-risk groups, such as the very young, older adults, and immunocompromised individuals. Most cases remit spontaneously and do not need diagnostic studies or specific therapy. Diagnostic studies are warranted for patients with fever or bloody diarrhea, or if the affected individual is immunocompromised. Infectious agents, especially viruses are responsible for most cases of acute diarrhea. Diarrhea-causing pathogens are usually transmitted through the fecal-oral route. Risk factors for this type of transmission include improper disposal of feces, lack of proper hand washing following defecation, and contact with feces before handling food. Prevention of dehydration is the most important therapeutic intervention for the management of individuals with acute diarrhea. Co morbid conditions which include acute renal failure, hypertension, diabetes, CAD modify the course and outcome of the illness. Epidemiologic risk factors should be investigated to assess the potential for spread in the community and morbidity. Conditions like malaria, dengue, enteric fever and hepatitis can present with diarrhea as one of the presenting symptoms and hence need diligent investigations to facilitate specific treatment.

References

- [1]. Acute diarrhea; Abhishek Deshpande, David S Lever, Edy Soffer August 2013; Cleveland clinic center for continuing education; www.clevelandclinicmeded.com
- [2]. Diarrhea Clinical Presentation: History, Physical, Causes; Aug 19, 2015 emedicine.medscape.com
- [3]. Diarrheal diseases; Fact sheet; WHO, April 2013
- [4]. A systematic analysis for the global burden of disease study 2013, *Lancet*, 383 (9995): 743-800.
- [5]. Global diarrhea burden, CDC, January 2013
- [6]. End stage renal disease (ESRD) John Hopkins Medicine Health, <http://www.hopkinsmedicine.org>
- [7]. Severe Diarrhea in a Patient with Hypertension, A. Fialho, MD; N. Nguyen, MD; SHM annual meeting, abstract number: 4
- [8]. Diabetes and Diarrhea: What's the Connection? - Health line, www.healthline.com/diabetes/diabetes-diarrhea, May 11, 2016
- [9]. Malaria as a cause of diarrhea--a review, Prasad RN¹, Virk KJ, *P N G Med J*, 1993 Dec;36(4):337-41
- [10]. Dengue Fever Clinical Signs, Symptoms and Recognition www.denguevirusnet.com/signs-a-symptoms.html 2016
- [11]. CAD Calcium Channel Blockers for Coronary Artery Disease - WebMD6.*P N G Med J*. 1993 Dec; 36(4):337-41.
- [12]. Typhoid fever: Medline Plus Medical Encyclopedia, <https://medlineplus.gov>, 1st May, 2015
- [13]. Symptom of hepatitis c without cirrhosis: Hepatitis C | National Institute of Diabetes and Digestive and Kidney diseases, <https://www.niddk.nih.gov/health-information/health>, 2015
- [14]. Hepatitis A-WHO Fact sheet, Updated July 2016
- [15]. Hepatitis B - Communicable Disease Control and Prevention, Sanfrancisco dept of public health. www.sfdcp.org/hepatitisb.html, 2015