

Research Article

A STUDY OF MANAGEMENT OF 100 CASES OF DIARRHEA ADMITTED IN MEDICINE WARDS IN A TERTIARY CARE TEACHING HOSPITAL WITH EMPHASIS ON EFFICACY AND SAFETY OF DRUGS USED

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ABSTRACT

Acute diarrheal diseases are global health problems worldwide. Prevalence of diarrhea in developed nations is not well established, but seems to be around 5%. Despite a progressive reduction in global diarrheal mortality, diarrheal morbidity is slightly increased worldwide. This study is proposed to collect and correlate the data about management of diarrheal patients, admitted to medicine wards in a tertiary care teaching hospital. A prospective, observational and non-interventional study, involving 100 patients over one and half year, was carried out to find the incidence rate of various causes of diarrhea, safety and efficacy of drugs used in management of diarrhea and outcome of patients. Of total 100 patients, male and female patients were 51% and 49%, respectively. Incidence was maximum in patients belonging to the age group of 18-30 years (35%). In 90% of patients diarrhea was infectious, 6% had drug-induced diarrhea and 4% was due to diabetic gastropathy. Most diarrheas occurred were bacterial. Ciprofloxacin and metronidazole were used in 87% patients while 3% were treated with ceftriaxone. Treatment duration lasted for 3 days to 6 days. Recovery was 100% with no adverse drug reaction to drugs used in management. Diarrhea is preventable and curable by following rules of personal hygiene and compulsory use of oral rehydration solutions. Meticulous use of antimicrobials will help to prevent adverse reaction, bacterial resistance and reduce cost of treatment. Our study will provide a working framework for health care providers to reduce the morbidity and mortality due to diarrhea.

Key words: Diarrhea, incidence, Oral Rehydration Therapy (ORT), antimicrobials.

INTRODUCTION

Diarrhea is defined as a change in bowel movements for an individual subject, characterized by an increase in the water content, volume and usually frequency of stools^[1, 2]. However, it is the consistency of the stools rather than the number that is most important. Frequent passing of formed stools is not diarrhea. The WHO defines diarrhea

as 3 or more watery stools on 2 or more consecutive days^[1]. There is fundamental importance of duration to diagnostic considerations, it may be further defined as acute (if <2 weeks), persistent (if 2 to 4 weeks) and chronic (if >4 weeks)^[3].

Diarrhea reflects increased water content of the stool, whether due to impaired

absorption and/or active secretion of ions, organic substrates ^[4]. A common disorder in its acute form, diarrhea, has many causes and may be mild to severe ^[5]. Most cases of mild diarrhea are of viral etiology, while severe diarrhea, especially associated with fever, tends to be of bacterial etiology. Chronic infectious diarrhea is often caused by parasites ^[6].

Acute diarrheal diseases are a global public health problem in developing and developed countries. They are a leading cause of mortality and morbidity for children under the age of 5 worldwide and have a major economic impact in developed countries. Although oral rehydration solution (ORS) along with oral zinc therapy has reduced mortality owing to acute diarrheal diseases, there are essentially no other approved, safe, and effective drugs to decrease stool volume and prevent fluid loss ^[7].

Gastroenteritis is characterized by the acute onset of diarrhea, which may or may not be accompanied by nausea, vomiting, fever and abdominal pain. It can be caused by a variety of infectious agents ^[8]. Infectious diarrhea is not only a problem of developing countries, but up to 30% of the populations in developed countries are also affected by food-borne bacterial diarrheas each year ^[2]. Worldwide, more than 1 billion people suffer with one or more episodes of acute diarrhea each year. Among 100 million persons affected annually by acute diarrhea in the United States, nearly half restrict activities, 10% consult physicians, 250,000 require hospitalization, and roughly 3000 die (primarily the elderly). The annual economic burden to the society is estimated at >\$20 billion. The prevalence of chronic diarrhea in the general population in developed nations has not been well established, but seems to be around 5% ^[1].

As a general rule, the principal causes of diarrhea depend upon the socioeconomic status of the population and the setting in which they are seen. In developing countries, chronic diarrhea is often due to infections, although functional disorders, malabsorption, and inflammatory bowel disease are also found. In developed countries, the most common causes are irritable bowel syndrome, inflammatory bowel disease, and malabsorption syndromes ^[9].

Although diarrhea may present as mere symptoms at one extreme, it can be severe or life-threatening at the other. It is imperative for clinicians to appreciate the pathophysiology, etiological classification, diagnostic strategies and therapeutic principles of diarrhea, due to the heterogeneous causes and potential severity of diarrhea, so that rational and cost-effective care can be delivered. It is most practical to base treatment of diarrhea on the clinical type of the illness, which can easily be determined when a patient is first examined. Laboratory studies are not needed ^[1]. Fluid and electrolyte replacement are of central importance to all forms of acute diarrhea. Judicious use of antibiotics is appropriate in selected cases of acute diarrhea. Many physicians still treat moderately to severely ill patients with diarrhea in febrile status empirically without diagnostic evaluation using a quinolone, such as ciprofloxacin (500 mg bid for 3 to 5 days) ^[3]. Such irrational use of antibiotics leads to both the drug resistance and the adverse drug reaction (ADR). Although ORS has reduced childhood mortality, repeated diarrheal episodes in children have been linked to malnutrition, stunting, and impaired physical and mental development ^[10]. Although there is a decline in this outcome however the underlying pathogenic mechanisms need to be better defined.

Further research must also determine whether treatment for dehydration is sufficient to avoid these consequences or if additional, novel therapies are needed to stop the diarrhea and promote epithelial repair^[7].

Despite a progressive reduction in global diarrheal disease mortality over the past 2 decades, diarrheal morbidity in published reports from 1990-2000 slightly increased worldwide compared with previous reports^[3]. So, the study was conducted to collect and correlate all the data about management of patients having diarrhea, admitted to medicine wards in a tertiary care teaching hospital.

MATERIALS AND METHOD

A prospective, observational and non-interventional study was carried out in medicine ward on the patients suffering with diarrhea who were serially admitted over a period of 18 months at tertiary care teaching hospital, Piparia after obtaining the approval of institutional ethics committee.

A total of 100 patients were enrolled for the study. Patients above 18 years of age having diarrhea for not more than 14 days belonging to either sex, who were willing to sign the informed consent form were included in the study. Those patients suffering with diarrhea for more than 14 days, unable to communicate (on ventilators) or not willing to participate in the study were excluded from the study. The patients willing to participate in the study were explained about the purpose and method of the study in the language they understood and only those patients were

enrolled, who were willing to give written consent in the informed consent form.

Patient related information such as age, sex, brief medical history, laboratory investigations and their results, information about drugs like name, dose and route, duration of therapy, indication, and start/stop dates were recorded in case record form.

All the indoor patients were followed up daily during their hospital stay and their hospital records were reviewed. Suspected ADRs were classified in terms of causality, severity and probability according to WHO-UMC, Hartwig and Naranjo scale respectively. They were assessed for suitability for White card reporting and classified as either Type A or Type B. Length of stay was also observed. Description of adverse drug reaction like its character, localization and severity was noted. The risk factors (e.g. impaired renal function, previous exposure to suspected drug, previous allergy, and social drug use) were identified and were recorded in ADRs reporting form. Confidentiality in respect to participating patients was maintained at all levels.

OBSERVATIONS AND RESULTS

Out of 100 patients suffering with diarrhea included in the study, 51 (51%) were male patients and 49 (49%) were female patients. Depending on their age they were grouped in five groups that included group I (18-30 years), group-II (31-40 years), group-III (41-50 years), group-IV (51-60 years) and group-V (>60 years) (Figure-1).

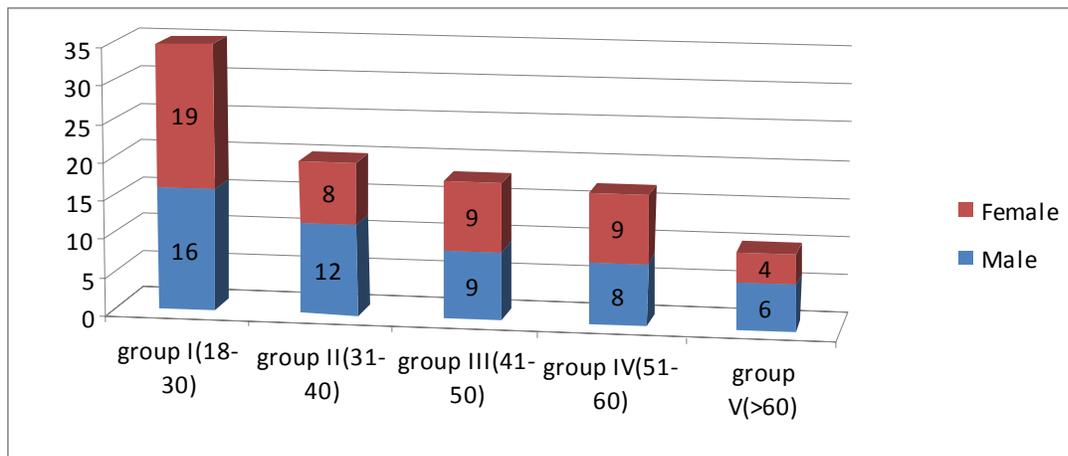


Figure 1: Classification of patients suffering with diarrhea according to their age-groups

Percentage of suffering with diarrhea was high in group I (35%) and least in group V (10%). Various causes for diarrhea included infections, drug-induced, nutritional deficiencies etc. that were taken as a tool for calculating their incidence rate. Out of 100 patients of diarrhea, we found that 90% of

patients had diarrhea due to different infectious etiology. Other 6% of patients had drug induced diarrhea and rest of the 4% of patients develop diarrhea due to diabetic gastropathy (Figure 2).

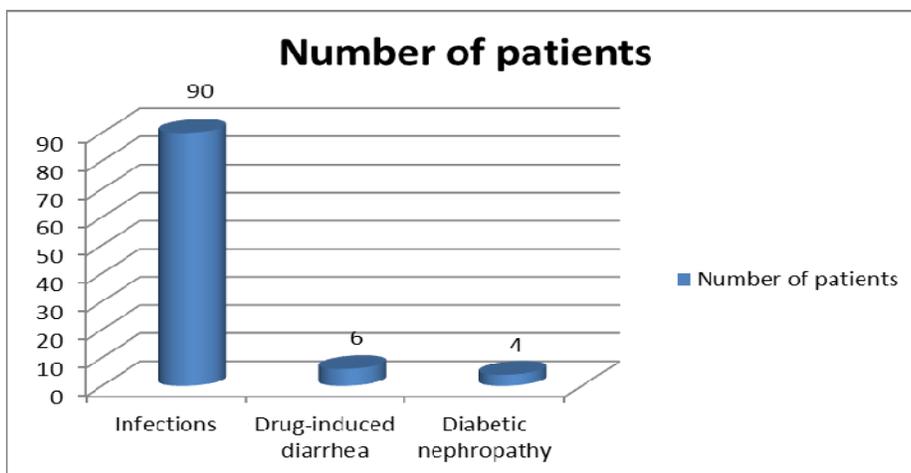


Figure 2: Percentage of patients suffering from different causes of diarrhea

High risk group includes travellers, consumers of certain food, immunodeficient person, daycare participant and their family members and institutionalized person. Of the enrolled patients it was observed in our study that 90 patients belonged to this category. With the help of laboratory investigations we analyzed that non-pathogenic (e coli, clostridium, bacteroides, enterococcus) were in 30 (33.33%), E. coli in 26 (28.89%), V. cholerae in 13 (14.44%), Shigella in 12 (13.33%), Campylobacter in 06 (6.67%) and Salmonella in 03 (3.33%) patients (Figure 3).

Several antibiotics were used in the management of diarrhea depending upon the

cause, which included ciprofloxacin, metronidazole and ceftriaxone. In our study we observed that among the 100 enrolled patients, two antibiotics (ciprofloxacin and metronidazole) were used for management of 87 (87%) patients while 3 (3%) patients were treated with single antibiotic (ceftriaxone) and in 10 (10%) patients, diarrhea was managed without antibiotics. Other than antibiotics, patients were given Oral Rehydration Solution (ORS), Intra Venous fluids (Ringer Lactate, Normal Saline), anti-motility drug, probiotics anti-ulcer drug and anti-emetic drug (Figure 4).

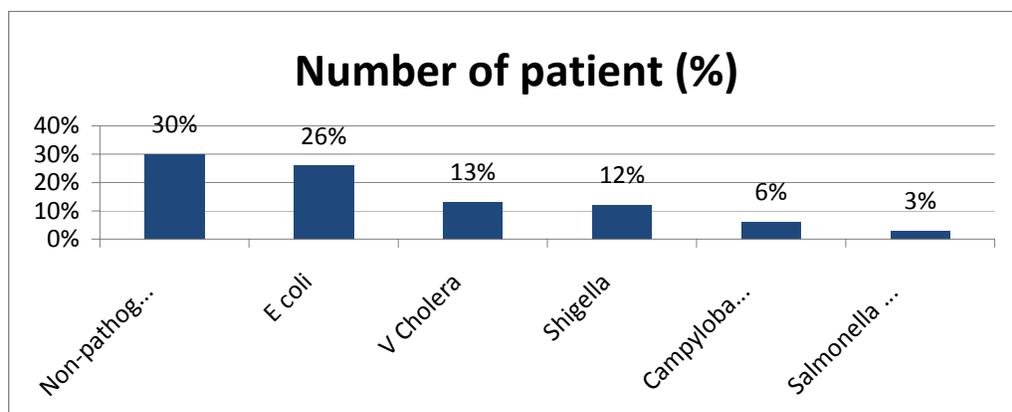


Figure 3: Percentage of different bacteria causing diarrhea

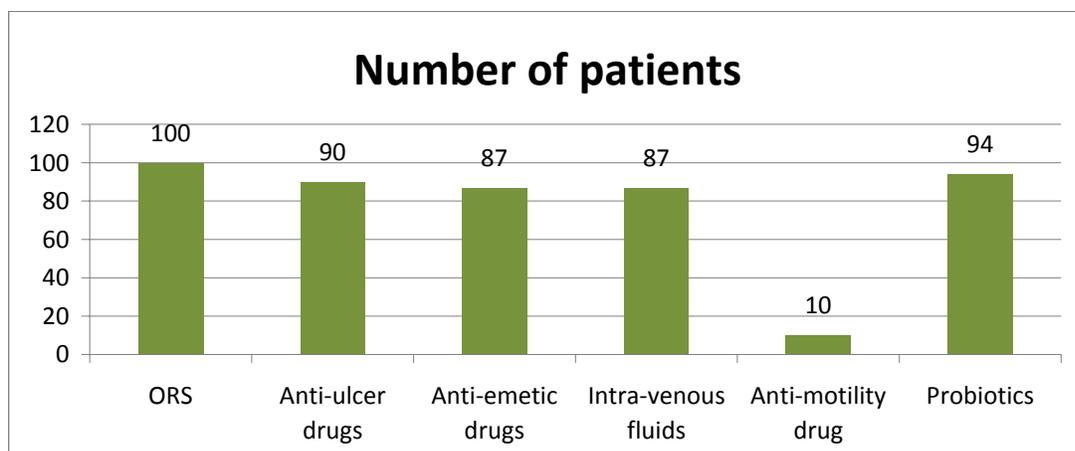


Figure 4: Percentage of other drug groups used in the management of diarrhea

For all 100 patients of diarrhea, duration of treatment ranged for 3 to 6 days. Maximum duration of treatment was for 4 days (47% patients) to 5 days (41% patients).

All 100 patients were recovered from diarrhea. There were no specific Adverse Drug Reactions (ADRs) noted in any of the patients with the drugs used for management of diarrhea.

DISSCUSSION

Most cases of acute diarrhea are self-limited; weather the cause being either infectious or non-infectious. However, morbidity and mortality due to acute diarrhea is significant even in developed countries. It can be a serious and even life-threatening symptom. The prevalence of documented infectious diarrhea is grossly underestimated, since many patients do not seek medical attention and laboratory investigation is not always done when patients do contact their physicians. The incidence of the well-known pathogens in the etiology of food poisoning/acute gastroenteritis has changed significantly in the last decade. One needs to essentially ask for specific details to ascertain the impact of the diarrhea^[11, 12].

Diarrhea as a syndrome has a heterogeneous etiology. Acute infectious diarrhea is most often either foodborne or waterborne disease. Infectious causes of diarrhea include viral, bacterial, and parasitic pathogens, while noninfectious causes of diarrhea include drugs, food allergies, primary gastrointestinal diseases such as inflammatory bowel disease, and other disease states such as thyrotoxicosis and the carcinoid syndrome. Antibiotics should not be administered unless there are indications of specific risk or severity^[13, 14].

Oral rehydration solutions (ORS) are essential in the management of every case of

diarrhea, while intravenous rehydration is sometimes needed in case of severely dehydrated patients. Fermented and gas forming foods particularly lactose should be avoided in patients with diarrhea. Antimicrobials should not be used routinely. For potentially responsive infections, selecting an effective antimicrobial requires knowledge of the likely sensitivity of the causative agent, information that is usually unavailable. In addition, use of antimicrobials adds to the cost of treatment, risks of adverse reactions and enhances the development of resistant bacteria. They do not prevent dehydration or improve nutritional status, which should be the main objectives of treatment^[15].

Many diarrheal diseases can be prevented by following simple rules of personal hygiene and safe food preparation. Hand-washing with soap is an effective step in preventing spread of illness and should be emphasized for caregivers of persons with diarrheal illnesses also. Selected populations may require additional education about food safety, and health care providers can play an important role in providing this information. Persons can reduce their risk by learning and following the hygiene methods, safe food-handling and preparation practices. General educational information on food safety is available from a number of sources, including many Websites, such as the following: [http:// www.foodsafety.gov](http://www.foodsafety.gov) and <http://www.healthfinder.gov>^[16].

Despite the gains in treatment of acute diarrhea with the implementation of Oral Rehydration Solution (ORS) therapy, additional agents that reduce the duration and amount of diarrhea should prove to be valuable treatment options. In addition to reducing morbidity and mortality from the diarrhea, it will be important to understand whether such treatments can also prevent long-term effects, including changes to the

intestinal epithelium. Future research should emphasize understanding of human physiology, gastrointestinal microbiology, and nutrient metabolism and use models that lend understanding to the human system.

CONCLUSION

It is suggested by the authors that, a rational synthesis can be offered that is appropriate for the optimal care of the individual patient and for the needs of the community. These general principals are intended to provide clinicians and public health practitioners with a consensus-based document that will aid in the management of acute diarrhea by addressing which patients need to be investigated, what investigations to be conducted, what medical treatments is to be given, and what steps are to be taken to ensure optimal clinical care and to protect the public health.

Recommendations to Advance Development in therapy of diarrheal diseases:

Develop a modified oral rehydration solution that will be associated with reduced duration and decreased amount of diarrhea.

- Improve understanding of pathophysiologic mechanisms of human diarrheal diseases, in part by developing a systems approach toward mapping and cataloging transport proteins, integrated with research on motor function, endocrine function, and the role of the enteric nervous system, in the small and large intestine in health and disease.
- Use in vivo methods in animal models and, when possible, human tissue, to determine the best approach to new drug discovery, whether this involves increasing sodium absorption, inhibiting anion secretion, or restoring barrier function, and considering other epithelial and non-epithelial

components involved in acute infectious diarrhea.

This study identifies areas where key research questions relating to the causes, diagnosis, treatment, and prevention of diarrheal diseases remain unanswered. These principles will need to be updated as additional information becomes available. The information provided herein is intended to provide a working framework for clinicians and public health providers in order to reduce the morbidity and mortality as diarrhea is curable if attended in time.

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