



CODEN [USA]: IAJPBB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

Available online at: <http://www.iajps.com>

Research Article

**ASSESSMENT OF ANTIBIOTIC USE IN THE TREATMENT OF  
ACUTE GASTROENTERITIS**

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Article Received: February 2023

Accepted: February 2023

Published: March 2023

**Abstract:**

*Background: Gastroenteritis is a disease of gastrointestinal tract. The development of drug resistance in patients suffering from gastroenteritis is due to irrational prescribing behaviour. Thus this study was carried out to assess the pattern of antibiotic use in the treatment of patients with acute gastroenteritis*

*Methodology: This present study was an observational, cross-sectional study carried out in general medicine inpatient unit of tertiary care hospital. Study duration was 4 months.*

*Result: Prescription of patients suffering from acute gastroenteritis were collected. Data was collected by conducting face to face interview of patient and from patient medical record. The data was analyzed by using descriptive statistical analysis method. A total of 100 prescription of patient with acute gastroenteritis admitted in tertiary care hospital during January 2017 to April 2017 were collected. Out of 100 patients 64% were female and 36% were male. Mean age of female and male was 43.54 and 48.38 years respectively. Chief complaints of patients were diarrhea (100%), vomiting (87%), fever (72%) and abdominal cramps (70%) Patients prescribed with antibiotic were 76% and those who were not prescribed with antibiotics were 24%. Ornidazole and ofloxacin combination drug were highly prescribed. Stool test was conducted for 16% of the patients. There was no detection of ova or parasite*

*Conclusion: Antibiotics were not prescribed to 24% of patients suffering from acute gastroenteritis. Antibiotics were prescribed to majority of patients (76%) and it was empirical therapy. Antibiotic should be used rationally. Irrational use of antibiotic can cause antibiotic resistance. Awareness about antibiotic resistance development needs to be provided to prescribers continuously.*

*Key words: Antibiotic rational use, gastroenteritis, Antibiotic resistance, diarrhea, Empirical therapy*

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Please cite this article in press Mahe naaz sultana et al, *Assessment Of Antibiotic Use In The Treatment Of Acute Gastroenteritis.*, Indo Am. J. P. Sci, 2023; 10(03).

**INTRODUCTION:**

Gastroenteritis(GE) is a disease of gastrointestinal tract (GI) . Gastroenteritis is caused by inflammation of the stomach, small intestine and large intestine [1].

Causes of gastroenteritis are viral, bacterial, parasitic infections . Depending on the age, situation and season , the viral gastroenteritis is more common [2,4].

Signs and symptoms :

It includes vomitings, diarrhea, abdominal pain, fatigue and fever which can also cause dehydration[3]. Usually acute gastroenteritis patients suffer for less than a week. It is also called as stomach flu[3].

In children, acute gastroenteritis is most commonly due to the viruses[4] . The commonest virus is rotavirus in children . Norovirus is common cause in the adult . It can also be spread through person to person[5] .

All patients should seek medical advice for diarrhea as it is important , which sometimes may carry poor prognosis. Severe diarrhea can also cause dehydration, shock, renal failure myocardial infarction and even a stroke[2]. Antibiotics are life-saving drugs in these conditions if gastroenteritis is secondary to bacterial infection but most of the acute gastroenteritis are viral in etiology and hence do not require any antibiotics unless there is a strong clinical and laboratory evidence of the bacterial infection. Only symptomatic treatment like rest and oral or intra venous fluids will suffice[6].

WHO has estimated that 80% of the antibiotics which are used in the society, 20-50% is irrationally used. As a result WHO has recommended for tackling antibiotic resistance. As it is threat to mankind. Antibiotic should be used rationally as unnecessary antibiotic treatment may lead to antibiotic resistance. [7][9]. Repeated infections are usually seen in places with poor sanitary conditions and malnutrition, stunted growth[8].

**EMPIRIC ANTIBIOTIC THERAPY**

If a prescriber has information (like blood culture) they can prescribe narrow spectrum antibiotic which is more effective and target specific bacteria that can cause a disease. Advantage of empirical therapy exist when causative pathogen is not known , when the laboratory diagnosis will not be effective or influential for treatment. In such cases there is little benefit of using such costly test which will delay treatment [10].

**Causes of Gastroenteritis:**

Primary causes of gastroenteritis are viruses (particularly rotavirus) and bacteria. Common viruses and common bacteria are Escherichia coli and Campylobacter species[7]. In children risk of Gastroenteritis is higher due to lack of immunity. [7]

**Pathophysiology:**

It is defined as diarrhea or vomiting which is because of infection of small or large bowel. Noninflammatory changes are seen in small bowel and inflammatory changes are seen in large bowel. Acute gastroenteritis is usually caused by infectious agents. Diarrhea is caused by several mechanisms adherence, mucosal invasion then enterotoxin production and cytotoxin production.

These mechanisms will result in the increased fluid secretion or there is decreased absorption. Because of these, there is increase in luminal fluid which cannot be reabsorbed, which leads to dehydration and there is loss of electrolytes and nutrients.[3]

**MATERIAL AND METHODS:****Study site:**

The study was conducted in the one of the inpatient ward of general medicine unit in Princess Esra hospital (PEH), tertiary care teaching hospital located in Shah Ali Banda road, Moghalpura, Hyderabad, Telangana, India. The study has been approved by institutional ethics committee.

**Study period:**

This study was conducted for duration of 4 months from January 2017 to April 2017.

**Study design:**

This was observational, cross sectional study, undertaken in general medicine inpatient unit of hospital.

**Sample size:** 100 prescriptions.

**Selection criteria :**

Prescription of patients suffering from acute Gastroenteritis

- **Inclusion criteria:**

- Prescription of patients suffering from acute Gastroenteritis who were admitted in inpatient ward.
- Prescription of patients suffering from acute Gastroenteritis of Age >18 years < 100 years.
- Prescription of patients suffering from acute Gastroenteritis in both the genders.

- **Exclusion criteria:**

Prescription of patients suffering from chronic diarrhea were excluded.

**Data collection:**

Proforma was designed for this present study and utilized for data collection. Source of data utilized for this study was patient medical record and face to face interview. Data collected comprised of following demographic and medical information about patient's age, gender, date of admission, symptoms such as fever, vomiting, diarrhea, abdominal cramps, bloody stool, laboratory investigations such as blood test, Widal test, other test, primary diagnosis, other diagnosis, laboratory results are collected for WBC count, RBC count, haemoglobin and widal test report. If antibiotic was prescribed for a particular

patient then antibiotic's name, dose, formulation, route of administration, duration of treatment and hospital stay, patient condition at the time of discharge was checked and documented. The final diagnoses written in the prescription were collected and documented.

The pharmacist has conducted face to face interview of the patient and relevant data was collected and documented. Pharmacist has entered all the data into excel sheet. The data was coded, checked and analyzed using descriptive statistical analysis method.

**RESULTS:****Table No. 1: Demographic data of patients:**

Parameter	Male	Female	Total
Total number of patients admitted with acute gastroenteritis diagnosis in general unit	36	64	100
Age (mean)	48.38	43.54	91.92

**B. Details of complaints of patients**

Chief complaints of patients were diarrhea (100%), vomiting (87%), fever (72%) and abdominal cramps (70%). There were no reported cases of blood vomiting and bloody stool

**C. Duration of hospital stay of patients****Table No. 2: Details of the duration of hospital stay of patients:**

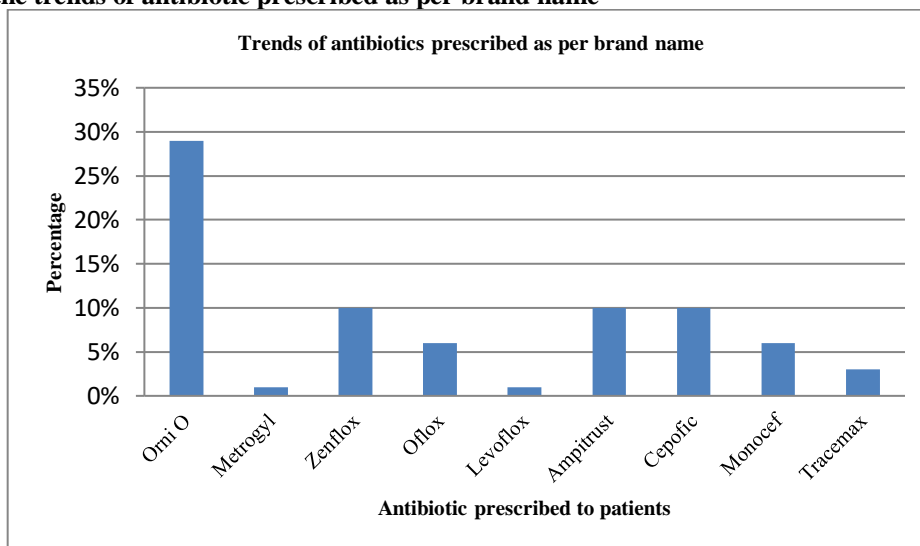
Parameter	Male	Female	Total
Duration of hospital stay -1-5 days (mean)	3.05	2.93	5.98

**D. Details of stool test report of patients:**

Details of stool test of patients : Stool test was done for 16% of patients. There were no detection of bacterial infection ,ova or parasite, test reports were normal .

**E . Details of the patients prescribed with antibiotics :**

Of the 100 patients, 76 % of the patients who were admitted was prescribed with antibiotics and 24% were not prescribed with antibiotics

**F: Details of the trends of antibiotic prescribed as per brand name**

### G . Details of Antibiotic prescribed to patients

76% of the patients were prescribed with antibiotic it was irrational

#### DISCUSSION:

This study has evaluated the appropriate use of antibiotic in acute gastroenteritis. The study can add great contribution to the knowledge and the facts of antibiotic use in acute gastroenteritis. Results suggest the high use of antibiotics in acute gastroenteritis patients

As high percentage of antibiotics are prescribed to patients this can lead to increase in development of resistant bacteria, it will increase the risk of adverse reactions. In most of the studies laboratory diagnosis was not done but in this study, laboratory diagnosis was done and results were collected. Laboratory diagnosis can give correct information.

Deepali Pathak k, Ashish Pathak k, Vishal Diwan a cross-sectional study conducted in Ujjain, India showed 843 diarrhea prescription were collected out of which only in 6 prescription guidelines were followed in which 71% cases antibiotics were prescribed, Ofloxacin and Ornidazole were mostly prescribed. There was low adherence for treatment guidelines to patients suffering from acute diarrhea. High use of antibiotics was found in prescriptions. Continuous education programmes are necessary for all practitioners. The study was compared with present study and Ornidazole was mostly prescribed, second on the list was Cephalosporin. This present study results of prescriptions as per guidelines were 76 % irrational use of antibiotics were seen and were almost similar to results reported by Deepali Pathak k, Ashish Pathak k, Vishal Diwan[11] .

In cross sectional survey by authors Feng-Qin Hou, Yan Wang, Ying Liu, done among physicians in 20 hospitals of different places of China . Data was collected for 800 patients. Mean between diarrhea onset and who visits a diarrhea clinic was 2.4. Out of which self medication was seen in 31.4% of patients before they visited the clinic%. Antibiotics were mostly used (60.8%) most common was Fluoroquinolones followed by Aminoglycosides. Irrational antibiotic treatment was given to 51.3% of patients. Findings suggest education and good health policies are required for improving medical practices. These findings are similar to the present study for irrational use of antibiotics. Continuous medical education is necessary for all prescribers[12]

Anita kotwani, Ranjit Roy study, Antibiotic use for acute diarrhea patients was surveyed by the interview of patients from private and public facilities from four localities which are residential. Collection of data was from 10 public sectors and 20 private clinics for 1 year . Percentage of antitherapeutic chemical

classification and the defined daily doses. Antibiotics were used irrationally for treatment of acute gastroenteritis in children as well as adults, interventional programme is necessary . This present study results has shown similar pattern antibiotic was used irrationally for acute gastroenteritis patients antibiotics which are received by the patients and antibiotic prescribing pattern was analyzed by therapeutic chemical classification and the defined daily doses. Antibiotics were used irrationally for treatment of acute gastroenteritis in children as well as adults, interventional programme is necessary . This present study results has shown similar pattern antibiotic was used irrationally for acute gastroenteritis patients[13]

#### CONCLUSION:

Majority(76%) of the antibiotics prescribed were irrational. Antibiotics prescribed to majority of patients(76%) was empirical therapy. Nitroimidazole and Quinolone antibiotic were highly(30%) prescribed. Awareness about antibiotic resistance development need to be provided to prescribers continuously. This can be achieved through continuous medical education of prescribers. Pharmacist should conduct studies to evaluate pattern of antibiotic use in future for further information in this regard. Pharmacist can play a vital role in updating present scenario and trend related to rational use of antibiotic to prescriber.

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