

ORIGINAL RESEARCH

Analysing Antibiotic Pattern Utilization in Treatment of Acute Diarrhea at a Tertiary Care Hospital in South India

¹Ramana Murthy CH, ²G.S. Thippeswamy, ³Jayapradha S Totad

^{1,2}Associate Professor, Department of General Medicine, ChalmedaAnandRao Institute of Medical Sciences, Karimnagar, Telangana, India

³Assistant Professor, Department of Pharmacology, Katuri Medical College and Hospital, Guntur, Andhra Pradesh, India

Corresponding Author

Jayapradha S Totad

Assistant Professor, Department of Pharmacology, Katuri Medical College and Hospital, Guntur, Andhra Pradesh, India

Received: 04 May, 2021

Accepted: 17 June, 2021

ABSTRACT

Background: Acute diarrheal diseases is one of the common morbid conditions encountered these days. Clinical presentation includes fever and headache without diarrhea and healthy carriers have been observed. Hence; the present study was conducted for evaluating antibiotic pattern utilization in treatment of acute diarrhea. **Materials & Methods:** The present cross-sectional study was conducted for evaluating antibiotic pattern utilization on the medical records of 200 patients who were treated for acute diarrheal disease. A structured questionnaire was developed based on the study objective to collect the necessary data. A Performa was made and detailed data of the questionnaire pertaining to the antibiotic prescribing pattern was recorded. Complete demographic and clinical details were also recorded separately. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:** Cotrimoxazole was the most commonly prescribed antibiotic found to be present in 35.5 percent of the cases. Ciprofloxacin was the next number found to be present in 21.5 percent of the cases. Other prescribed antibiotics included doxycycline, gentamycin, ceftriaxone, cephalixin and metronidazole found to be present in 5 percent, 2 percent, 1 percent, 2.5 percent and 14 percent of the patients respectively. Metronidazole + Ciprofloxacin and Cotrimoxazole + Amoxicillin were found to be present in 6 percent and 6.5 percent of the patients respectively. **Conclusion:** There is irrational use of antibiotics for the treatment of acute diarrhea that warrants interventional strategies.

Key words: Diarrhea, Antibiotic, Pattern.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Acute diarrheal diseases ranked seventh in the causes of mortality in LMIC in the global disease burden series, 2013, with an estimated 1.3 million deaths (2.4 %). Most of these deaths occur in children under the age of 5 years in LMIC and diarrhea remains among the top five causes of all deaths among children younger than age 5 years, as tabulated in 2013. The incidence of acute diarrhea in the general population could be estimated by prospective studies such as those organized in the Food-borne Disease Active Surveillance Network (FoodNet) in the USA. The network observed that 6% of interviewed people reported an acute diarrheal illness during the 4 weeks preceding the interview, that is an annualized rate of 0.72 episodes per person-year. Rates of illness were highest among children younger than 5 years (1.1

episodes per person-year) and were lowest in persons aged ≥ 65 years (0.32 episodes per person-year).¹⁻³

Clinical presentation includes fever and headache without diarrhea and healthy carriers have been observed. Humans are the only known reservoir for serotype Typhi, which can be transmitted by direct person-to-person contact and contaminated water and food. A syndrome similar to typhoid fever is due to serotypes Paratyphi A, Paratyphi B and Paratyphi C.⁴ ⁵The Indian Academy of Paediatrics published guidelines for the management of acute diarrhea in 2004, which were further revised in 2006. The guidelines focused on the use of low osmolarity ORS and zinc. Antibiotic use is recommended only for acute bloody diarrhea/dysentery. As per local standard treatment guidelines also, antibiotics are not recommended for acute diarrhea in adults.

Unfortunately, diarrhea is a condition for which the misuse of antibiotics is common and is reported from different parts of the world. Understanding the extent and pattern of antimicrobial use for acute diarrhea in the community is important for defining a regional intervention program to promote the rational use of antimicrobials and thus limit the spread of AMR and reduce the cost of therapy for acute diarrhea.⁶⁻⁸ Hence; the present study was conducted for evaluating antibiotic pattern utilization in treatment of acute diarrhea.

MATERIALS & METHODS

The present cross-sectional study was conducted for evaluating antibiotic pattern utilization on the medical records of 200 patients who were treated for acute diarrheal disease. A structured questionnaire was developed based on the study objective to collect the necessary data. A Performa was made and detailed data of the questionnaire pertaining to the antibiotic prescribing pattern was recorded. Complete demographic and clinical details were also recorded

separately. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

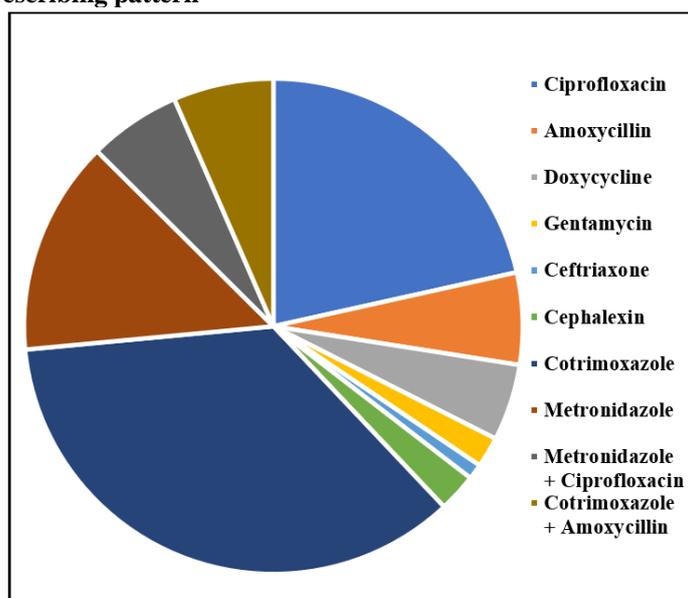
RESULTS

Data of a total of 200 patients was analyzed. Mean age of the patients was 45.3 years. Out of 200 patients, 161 patients were males while the remaining 39 patients were females. Majority proportion of patients were of urban residence. Cotrimoxazole was the most commonly prescribed antibiotic found to be present in 35.5 percent of the cases. Ciprofloxacin was the next number found to be present in 21.5 percent of the cases. Other prescribed antibiotics included doxycycline, gentamycin, ceftriaxone, cephalixin and metronidazole found to be present in 5 percent, 2 percent, 2.5 percent and 14 percent of the patients respectively. Metronidazole + Ciprofloxacin and Cotrimoxazole + Amoxycillin were found to be present in 6 percent and 6.5 percent of the patients respectively.

Table 1: Antibiotic prescribing pattern

Antibiotics	Number	Percentage
Ciprofloxacin	43	21.5
Amoxycillin	12	6
Doxycycline	10	5
Gentamycin	4	2
Ceftriaxone	2	1
Cephalexin	5	2.5
Cotrimoxazole	71	35.5
Metronidazole	28	14
Metronidazole + Ciprofloxacin	12	6
Cotrimoxazole + Amoxycillin	13	6.5
Total	200	100

Graph 1: Antibiotic prescribing pattern



DISCUSSION

Diarrhea is defined as the production of stools of abnormally loose consistency, usually associated with excessive frequency of defecation and with excessive stool output. Normal stool output is approximately 100 to 200 g/day. Although diarrhea is a common symptom, most cases are self-limited or successfully treated by patients with over-the-counter medications. Acute diarrhea, defined as diarrhea that has been present for <4 weeks, is a nonspecific response of the intestine to several different conditions, including infections, adverse reactions to drugs, inflammatory bowel disease, and ischemia. The specific drugs and poorly absorbed sugars that can cause acute diarrhea are discussed by Fine et al. Although most cases of diarrhea are a result of infections, specific organisms can be identified in only a minority of patients. Patients seek medical attention for diarrhea when it is severe, prolonged, or if they develop worrisome symptoms, such as fever, prostration, or rectal bleeding.⁶⁻⁹ Hence; the present study was conducted for evaluating antibiotic pattern utilization in treatment of acute diarrhea.

Data of a total of 200 patients was analyzed. Mean age of the patients was 45.3 years. Out of 200 patients, 161 patients were males while the remaining 39 patients were females. Majority proportion of patients were of urban residence. Cotrimoxazole was the most commonly prescribed antibiotic found to be present in 35.5 percent of the cases. Ciprofloxacin was the next number found to be present in 21.5 percent of the cases. Misganaw D et al evaluated the antibiotic use pattern in the treatment of acute diarrheal disease. Data was collected from 230 patients' record cards treated for acute diarrheal disease from January 2018 to December 2018 using structured questionnaires. The finding is presented using frequency distribution and percentages in tables as well as figures. Among the 230 patients, 49.60% were males and the rest were females. From the total, 172 of them were with watery type of diarrhea and 132 of them were prescribed antibiotics inappropriately out of which 77 were under 5 years. In addition, 27 patients were diagnosed with mucoid diarrhea and only eight of them were treated with antibiotics whereas 31 patients were with bloody type of diarrhea and 10 of them were not treated with antibiotics. Of the 230 cases, 161 (70%) patients received different types of antibiotics, and cotrimoxazole, amoxicillin and ciprofloxacin were the most prescribed antibiotics. The study revealed that there is a high level of inappropriate antibiotics use which may fuel the increased antimicrobial resistance and associated costs nationally as well as globally.¹³

In the present study, other prescribed antibiotics included doxycycline, gentamycin, ceftriaxone, cephalixin and metronidazole found to be present in 5 percent, 2 percent, 1 percent, 2.5 percent and 14 percent of the patients respectively. Metronidazole + Ciprofloxacin and Cotrimoxazole + Amoxicillin were

found to be present in 6 percent and 6.5 percent of the patients respectively. Tulu S et al, in a previous study, assessed the pattern of antibiotic use for acute diarrhoeal diseases. Data were collected retrospectively from patients treated for diarrhoeal diseases from January 2015 to December 2015 using structured questionnaires and entered into SPSS (IBM 20) and descriptive statistics was carried out. Among the 303 patients, 51.2% were males and 48.8% were females. Of them, 62% were children under five years. Two hundred sixty three (86.8%) patients received eight different types of antibiotics and cotrimoxazole (178 patients, 58.7%) was the most prescribed antibiotics, followed by ciprofloxacin (33, 10.9%) and amoxicillin (14, 4.6%). Based on the presence of blood in stools, 14.5% of cases were of invasive bacterial type. According to the recommendations of WHO, the rate of overuse of antibiotics was 72.3%. Their study revealed that there was high overuse of antibiotics for both adults and children under five with acute diarrhoea in Bishoftu General Hospital. And Cotrimoxazole was the most prescribed antibiotic.¹⁴ Kotwani A et al obtained information on the current prescribing rates of antibiotics in acute diarrhea in the community. Antibiotic use in acute diarrhea in the community (December 2007–November 2008) was surveyed by using patients' exit interviews at public and private facilities from four residential localities. Data were collected from 10 public sector facilities and 20 private clinics over 1 year. The percentage of patients receiving antibiotics and the prescribing pattern of antibiotics were analyzed by using the anatomical therapeutic chemical classification and the defined daily dose. At public facilities 43% (171 of 398) and at private facilities 69% (76 of 110) of the patients with acute diarrhea were prescribed at least one antibiotic. Diarrhea increased during peak humid summer months, but doctors were fairly consistent in their antibiotic prescribing throughout the year. The main antibiotic class that was prescribed in both public and private sector facilities was fluoroquinolones, J01MA (91.5% and 96%, respectively). Pediatricians working in the private sector prescribed antibiotics to 51.5% (17 of 33) of children with diarrhea, whereas pediatricians working in the public sector prescribed antibiotics to 23% of children with acute diarrhea. At public facilities, the most commonly prescribed fluoroquinolone was norfloxacin, followed by ofloxacin and ciprofloxacin. At private clinics, it was ofloxacin followed by ciprofloxacin.¹⁵

CONCLUSION

There is irrational use of antibiotics for the treatment of acute diarrhea that warrants interventional strategies.

REFERENCES

1. Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015;386(9995):743–800.
2. Imhoff B., Morse D., Shiferaw B. Burden of self-reported acute diarrheal illness in FoodNet surveillance areas, 1998–1999. *Clin Infect Dis*. 2004;38(Suppl. 3):S219–S226.
3. Sandler R.S., Everhart J.E., Donowitz M. The burden of selected digestive diseases in the United States. *Gastroenterology*. 2002;122:1500–11.
4. Zerr D.M., Allpress A.L., Heath J., Bornemann R., Bennett E. Decreasing hospital-associated rotavirus infection: a multidisciplinary hand hygiene campaign in a children's hospital. *Pediatr Infect Dis J*. 2005;24:397–403.
5. O'Horo J., Safdar N. The role of immunoglobulin for the treatment of *Clostridium difficile* infection: a systematic review. *Int J Infect Dis*. 2009;13(6):663–7.
6. L.C. Fischer, O.F. Walker, W.M. Young, E.R. Black. Zinc and low osmolarity oral rehydration salts for diarrhea: a renewed call to action. *Bull WHO* 2009; 87:733-804.
7. N. Bhandari, R. Bahl, S. Taneja, et al. Substantial reduction in severe diarrheal morbidity by daily zinc supplementation in young north Indian children. *Pediatrics* 2002; 109(6):e86.
8. S. Bhatnagar, N. Bhandari, U.C. Mouli, M.K. Bhan. Consensus statement of IAP National Task Force: status report on management of acute diarrhea. *Ind Pediatr* 2004; 41(4): 335-48.
9. Fine K.D, Krejs G.J, Fordtran J.S. Diarrhea. In: Sleisenger M.H, Fordtran J.S, editors. *Gastrointestinal Disease: Pathophysiology, Diagnosis, Management*. 6th ed. WB Saunders; Philadelphia: 1998: 1043–72.
10. Powell D.W. Approach to the patient with diarrhea. In: Yamada T, Alpers D.H, Owyang C, Powell D.W, Silverstein F.E, editors. *Textbook of Gastroenterology*. 2nd ed. JB Lippincott; Philadelphia: 1995. pp. 813–31.
11. Prado V, O'Ryan M.L. Acute gastroenteritis in Latin America. *Infect Dis Clin of North Am*. 1994;8:77–106.
12. Jones TF, Bulens S, Gettner S, et al. Use of stool collection kits delivered to patients can improve confirmation of etiology in foodborne disease outbreaks. *Clin Infect Dis*. 2004;39(10):1454–59.
13. Misganaw D, Abteu K. Evaluation of Antibiotic Utilization Pattern During Acute Diarrheal Disease at Chefa-Robit Health Center, Kemissie, North East Amhara, Ethiopia. *Drug Healthc Patient Saf*. 2020;12:169-75.
14. Tulu S et al. Assessment of Antibiotic Utilization Pattern in Treatment of Acute Diarrhoea Diseases in Bishoftu General Hospital, Oromia Ethiopia. *Advances in Medicine* 2018(1):1-6.
15. Kotwani A et al. Antibiotic-Prescribing Practices of Primary Care Prescribers for Acute Diarrhea in New Delhi, India. *Value in health* 2012; 15 :S116 –S119.