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Original Article

Comparative Efficacy Analysis of Various Antibiotics in Diarrhea Patients at a Tertiary Care Centre

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ABSTRACT

Background: Acute diarrhea is a prevalent issue faced by family physicians in adult patients. The primary cause is often viral gastroenteritis, which typically resolves on its own. Factors such as increased travel, the presence of comorbid conditions, and foodborne illnesses contribute to a rise in bacterial cases of acute diarrhea. Hence; the present study was conducted for comparative efficacy analysis of various antibiotics in diarrhea patients at a tertiary care centre.

Materials & Methods: A total of 60 patients were enrolled and were randomized into two study groups with 30 patients in each group: Rifaximin group and Ciprofloxacin group. Complete demographic and clinical details of all the patients were obtained. Subjects completed daily diaries of clinical symptoms and signs, including the time and form of all stools passed during the 5- day study period. Safety was assessed by means of physical examination, assessment of vital signs, and routine blood studies relevant to hematologic, liver, and kidney function. To be eligible, subjects had to pass more than unformed stools in 24 hours. Outcome was evaluated and compared. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software.

Results: Mean age of the patients of the Rifaximin group and ciprofloxacin group was 23.8 years and 25.1 years respectively. At 24 to 48 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 2.5 and 2.1 respectively. At 48 to 72 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 1.8 and 1.5 respectively. At 72 to 96 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 0.8 and 0.8 respectively. Although non-significant, slightly better results were obtained among patients of the ciprofloxacin group.

Conclusion: Administration of antibacterial drugs has become the recommended therapy for this illness. Because of their activity against each of these bacteria, fluoroquinolones have become the accepted therapeutic agents for diarrhea in adults. Slightly better results were seen among patients of the ciprofloxacin group.

KEYWORDS: Rifampicin, Diarrhea, Antibiotic.

INTRODUCTION

Acute diarrhea is a prevalent issue faced by family physicians in adult patients. The primary cause is often viral gastroenteritis, which typically resolves on its own. Factors such as increased travel, the presence of comorbid conditions, and foodborne illnesses contribute to a rise in bacterial cases of acute diarrhea. A thorough history and physical examination that assesses risk factors and identifies signs of inflammatory diarrhea or severe dehydration can help guide necessary diagnostic testing and treatment options. Generally, laboratory evaluations are not required for most patients, and routine stool cultures are not advised.[1] The main focus of treatment is on preventing and managing dehydration. Diagnostic assessments should be limited to individuals experiencing severe dehydration or illness, persistent fever, bloody stools, or those who are immunocompromised, as well as in instances of suspected hospital-acquired infections or outbreaks. Oral

rehydration therapy combined with early refeeding is the recommended approach for treating dehydration.[2,3] Antimotility medications should be avoided in cases of bloody diarrhea; however, loperamide combined with simethicone may alleviate symptoms in patients with watery diarrhea. The use of probiotics may also reduce the duration of illness. When indicated, antibiotics can effectively treat conditions such as shigellosis, campylobacteriosis, Clostridium difficile infections, traveler's diarrhea, and certain protozoal infections.[4] Rifaximin is a nonsystemic antibiotic with broad-spectrum in vitro activity against enteric bacteria and is indicated for the treatment of TD in patients 12 years or older caused by noninvasive strains of E coli. Rifaximin 600 or 800 mg/day has been shown to reduce the duration of diarrhea with a safety and tolerability profile similar to placebo. In a randomized, double-blind study of 187 individuals with TD, rifaximin was as effective as ciprofloxacin in reducing the median time from the administration of the first dose until passage of the last unformed stool (TLUS) (25.7 vs 25 hours, respectively) in patients with pathogen-specific illness.[5- 7] Hence; the present study was conducted for comparative efficacy analysis of various antibiotics in diarrhea patients at a tertiary care centre.

MATERIALS & METHODS

A total of 60 patients were enrolled and were randomized into two study groups with 30 patients in each group: Rifaximin group and Ciprofloxacin group. Complete demographic and clinical details of all the patients were obtained. Subjects completed daily diaries of clinical symptoms and signs, including the time and form of all stools passed during the 5- day study period. Safety was assessed by means of physical examination, assessment of vital signs, and routine blood studies relevant to hematologic, liver, and kidney function. To be eligible, subjects had to pass more than unformed stools in 24 hours. Outcome was evaluated and compared. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

RESULTS

The mean age of the patients of the Rifaximin group and ciprofloxacin group was 23.8 years and 25.1 years respectively. Majority proportion of patients of both the study groups were males. The number of unformed stools were 7.2 among the rifaximin group and 7.8 in ciprofloxacin group. The mean duration of illness among patients of the rifaximin group and ciprofloxacin group was 23.88 and 25.1 respectively. At 24 to 48 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 2.5 and 2.1 respectively. At 48 to 72 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 1.8 and 1.5 respectively. At 72 to 96 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 0.8 and 0.8 respectively. Although non-significant, slightly better results were obtained among patients of the ciprofloxacin group.

Table 1: Demographic data

Variable	Rifaximin group	Ciprofloxacin group
Mean age (years)	23.8	25.1
Males	16	18
Females	14	12

Table 2: Baseline characteristics

Variable	Rifaximin group	Ciprofloxacin group
Number of unformed stools	7.2	7.8
Duration of illness (hours)	23.8	25.1

Table 3: Comparison of mean number of unformed stools per day

Time intervals	Rifaximin group	Ciprofloxacin group	p-value
24 to 48 hours	2.5	2.1	0.84
48 to 72 hours	1.8	1.5	0.55
72 to 96 hours	0.8	0.4	0.25

DISCUSSION

Acute diarrhea continues to be a significant global health concern, contributing to substantial morbidity and mortality, with over two million fatalities each year. This condition is particularly prevalent in developing nations, predominantly affecting children under the age of five. While the majority of acute diarrhea cases are attributed to viral infections, such as rotavirus and enteric adenovirus, which typically manifest in a mild and self-limiting manner, healthcare providers in outpatient and emergency settings, especially in resource-limited countries, often encounter severe cases. These critical presentations are marked by symptoms of profound dehydration, toxemia, pronounced leukocytosis with elevated immature cell counts, high fever, significant welfare deterioration, tenesmus, and substantial fecal blood loss, along with the potential for widespread infection.

The primary approach to treatment involves supportive anti-dehydration therapy combined with appropriate nutritional support, which remains essential regardless of the underlying cause or severity of the condition. Timely and early intervention with these measures is linked to improved patient outcomes. Furthermore, dehydration can mimic symptoms of toxemia, complicating the clinical evaluation of severity. Therefore, it is imperative that volumetric resuscitation, electrolyte balance restoration, and nutritional support are prioritized before implementing any additional therapeutic strategies.[8- 10] Hence; the present study was conducted for comparative efficacy analysis of various antibiotics in diarrhea patients at a tertiary care centre.

The mean age of the patients of the Rifaximin group and ciprofloxacin group was 23.8 years and 25.1 years respectively. Majority proportion of patients of both the study groups were males. The number of unformed stools were 7.2 among the rifaximin group and 7.8 in ciprofloxacin group. The mean duration of illness among patients of the rifaximin group and ciprofloxacin group was 23.88 and 25.1 respectively. At 24 to 48 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 2.5 and 2.1 respectively. At 48 to 72 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 1.8 and 1.5 respectively. At 72 to 96 hours, the mean number of unformed stools among patients of Rifaximin group and Ciprofloxacin group was 0.8 and 0.8 respectively. Although non-significant, slightly better results were obtained among patients of the ciprofloxacin group.

Herbert L. Dupont et al evaluated the efficacy and safety of rifaximin-loperamide in the treatment of travelers' diarrhea. Consenting adults with acute diarrhea (≥3 unformed stools in 24 hours with ≥1 symptom of enteric infection) were randomized to receive rifaximin 200 mg 3 times daily for 3 days; loperamide 4 mg initially followed by 2 mg after each unformed stool; or a combination of both drugs using the same dosing regimen. The primary end point was the median time from beginning therapy until passing the last unformed stool. A total of 310 patients completed treatment with rifaximin (n = 102), loperamide (n = 104), or rifaximin-loperamide combination therapy (n = 104). The groups showed demographic similarity. Rifaximin and rifaximin-loperamide significantly reduced the median time until passage of the last unformed stool (32.5 ± 4.14 h and 27.3 ± 4.13 h, respectively) vs loperamide (69 ± 4.11 h; P = .0019). The mean number of unformed stools passed during illness was lower with rifaximin-loperamide (3.99 ± 4.28) compared with rifaximin (6.23 ± 6.90; P = .004) or loperamide alone (6.72 ± 6.93; P = .002). All treatments were well tolerated with a low incidence of adverse events. Rifaximin-loperamide therapy provided rapid symptomatic improvement and greater overall wellness compared with either agent alone.[11]

The efficacy of rifaximin orally taken at a dose of 200 mg three times a day for 3 days, the currently recommended dose for acute diarrhea, was evaluated in two RCTs in adult patients with travelers' diarrhea [Taylor et al. 2006; Steffen et al. 2003]. One study with three treatment arms was conducted in 380 patients at clinical sites in Mexico, Guatemala, and Kenya (study 1) [Steffen et al. 2003]. The study participants were randomized to receive either 3-day courses of rifaximin (200/400 mg three times a day) or placebo. Stool specimens were collected before and after treatment. For both rifaximin dosages, the median TLUS was significantly shorter compared with the placebo (32.5 and 32.9 h vs. 60.0 h, respectively; p = 0.001). Moreover, the participants in the rifaximin groups showed better clinical responses than the placebo group (79.2% and 81.0% vs. 60.5%, p = 0.001). Nevertheless, the microbiologic-eradication rates based on the posttreatment fecal cultures in the participants with at least one pathogen before treatment were not significantly different across the treatment groups, and it was the same in the subgroup with ETEC identified from the stool specimens [Steffen et al. 2003].[12, 13]

CONCLUSION

Administration of antibacterial drugs has become the recommended therapy for this illness. Because of their activity against each of these bacteria, fluoroquinolones have become the accepted therapeutic agents for diarrhea in adults. Slightly better results were seen among patients of the ciprofloxacin group.

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