

Original article:

Comparison of Efficacy of Different Antibiotic Therapy in Patients with Diarrhea: A Hospital Based Study

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Abstract

Background: Traveler's diarrhea (TD) is defined as the development of at least three stools per day, is common in travelers who go outside their own country. TD is associated with one or more enteric symptom, such as abdominal pain or cramps, occurring in a traveler after arrival, usually in a resource-limited destination. Hence; present study was planned to compare the efficacy of two different antibiotics regimes in treating patients with TD.

Materials & Methods: A total of 80 patients with TD were included in the present study and were randomly divided into two study groups as follows: Group A: Patients were given ofloxacin therapy for five days, Group B: Patients were given ciprofloxacin therapy for five days. Subjects of both the study groups were treated according to the antibiotic course of their respective group. Response in terms of both clinical and microbiological improvement was assessed.

Results: Clinical cure was seen in 92.5 percent of the patients of group A, while it was seen in 90 percent of the patients of the group B. Microbiological cure was seen in 90 percent patients each of both the study groups. Non- significant results were obtained while comparing the clinical and microbiological efficacy of both the antibiotics in TD patients.

Conclusion: Both the antibiotics used in the present study are equally effective in treating patients with TD.

Key words: Antibiotic, Diarrhea, Efficacy.

INTRODUCTION

Bacteria are responsible for up to 50% of the cases of acute diarrhea seen in clinical practice. When patients with traveler's diarrhea and severe noninfantile diarrhea and dysentery are examined, bacterial enteropathogens are responsible for well over half of the cases. Antimicrobial agents have been shown to be effective in the treatment of diarrhea as a result of enterotoxigenic *Escherichia coli* (ETEC) infection, shigellosis, and traveler's diarrhea. An important consideration in the treatment of diarrhea is the development of resistance to the commonly used antimicrobial agents with repeated exposure. Traveler's diarrhea (TD) is defined as the development of at least three stools per day, is common in travelers who go outside their own country. TD is associated with one or more enteric symptom, such as abdominal pain or cramps, occurring in a traveler after arrival, usually in a resource-limited destination.⁴

Given that most cases of TD are caused by ingestion of contaminated food and water, it is thought that counseling on food and water hygiene measures reduces the risk of TD.⁵⁻⁷ However, there is little evidence that such precautions decrease the incidence of TD, and it is likely that factors outside of a traveler's control, such as poor

restaurant hygiene, may have a higher impact. Despite this, travelers should be educated on appropriate food and water precautions including frequent hand washing with soap.^{8,9} Hence; present study was planned to compare the efficacy of two different antibiotics regimes in treating patients with TD.

MATERIALS & METHODS

The present investigation was commenced in the department of General Medicine, Swatantra Sainani late Dr. Mangal Singh District Hospital, Dholpur, Rajasthan, India. Written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 80 patients with TD were included in the present study and were randomly divided into two study groups as follows:

Group A: Patients were given ofloxacin therapy for five days

Group B: Patients were given ciprofloxacin therapy for five days

Exclusion Criteria

- Subjects with positive history of any other systemic illness,
- Subjects with history of any known drug allergy,
- Subjects with history of any other gastric lesion

Subjects of both the study groups were treated according to the antibiotic course of their respective group. Response in terms of both clinical and microbiological improvement was assessed. Evaluation of the results was done by SPSS software. Chi- square test was used for the assessment of level of significance.

RESULTS

In the present study, a total of 80 subjects were included. Mean age of the patients of the group A was 43.5 years and 45.8 years respectively. There were 25 males and 24 males in the Group A and Group B respectively. There were 25 males and 26 females in the Group A and Group B respectively. Clinical cure was seen in 92.5 percent of the patients of group A, while it was seen in 90 percent of the patients of the group B. Microbiological cure was seen in 90 percent patients each of both the study groups. Non- significant results were obtained while comparing the clinical and microbiological efficacy of both the antibiotics in TD patients.

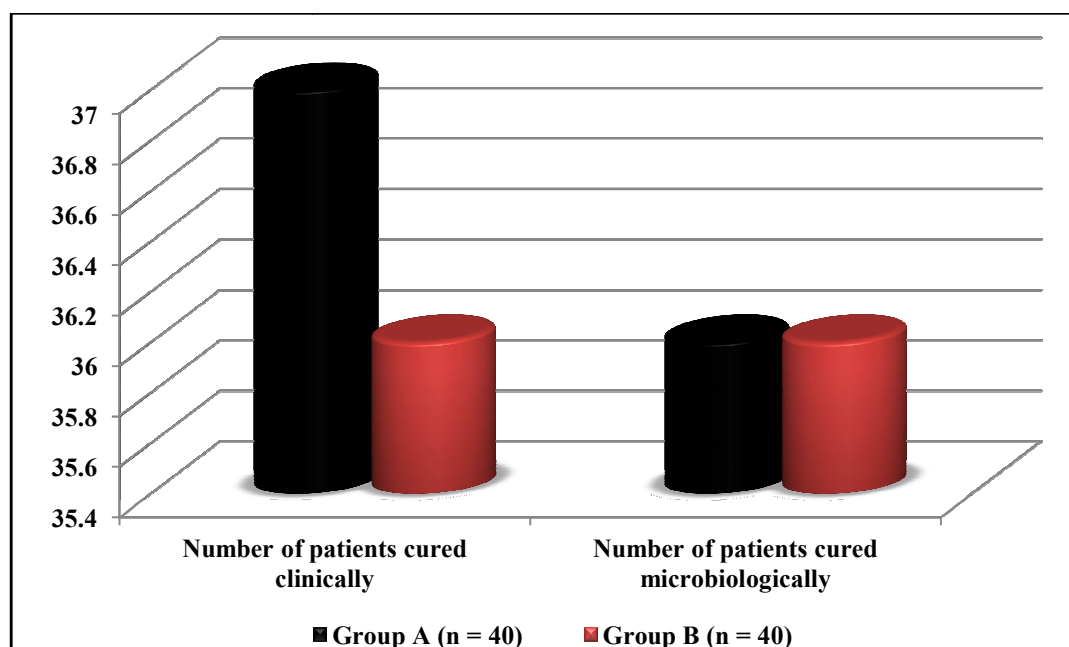
Table 1: Clinical cure

Group	Number of patients cured	Percentage of patients cured	P- value
Group A (n = 40)	37	92.5	0.44
Group B (n = 40)	36	90	

Table 2: Microbiological cure

Group	Number of patients cured	Percentage of patients cured	P- value
A (n = 40)	36	90	1
B (n = 40)	36	90	

Graph 1: Clinical and microbiological cure



DISCUSSION

Self-treatment upon initial symptoms is the mainstay of traveler’s diarrhea management, the backbone of which is oral rehydration therapy. Adding to that backbone, for mild cases, the use of bismuth and loperamide is effective and sufficient. For moderate or severe TD, use of empiric oral antibiotics has been found to be effective in shortening the duration of symptoms, though there is increasing evidence that this practice may have societal and personal health costs.¹⁰ Hence; we planned the present study to compare the efficacy of two different antibiotics regimes in treating patients with TD.

In the present study, a total of 80 subjects were included. Mean age of the patients of the group A was 43.5 years and 45.8 years respectively. There were 25 males and 24 males in the Group A and Group B respectively. There were 25 males and 26 females in the Group A and Group B respectively. Fluoroquinolones are generally well-tolerated among the majority of patients with comparable efficacies between ciprofloxacin and levofloxacin. Mild and self-limiting adverse effects (e.g., nausea and vomiting) occur in approximately 5% of patients. Serious adverse effects, such as tendinopathy and *C. difficile* - associated diarrhea, are also associated with fluoroquinolone use, but are less frequent. Furthermore, increasing fluoroquinolone resistance worldwide has reduced the effectiveness of this antibiotic.¹⁰ The key factor in the management of acute watery traveler's diarrhea, particularly in infants and young children, is the restoration of water and electrolyte balance. This does not reduce the duration of the illness but will limit dehydration and prevent acidosis. Many patients will require no additional therapy, whereas some will need pharmacologic treatment to shorten the duration of diarrhea or to relieve the accompanying symptoms, like abdominal discomfort, nausea and vomiting. A typical 3- to 5-day illness can be reduced to approximately 1 day by trimethoprim-sulfamethoxazole (TMP-SMX) combination. Some other systemic antimicrobials have been successfully used but, during the last few years, the 4-fluoroquinolone drugs have received considerable attention and have been shown to be highly effective in reducing the duration of traveler's diarrhea.¹¹

In the present study, clinical cure was seen in 92.5 percent of the patients of group A, while it was seen in 90 percent of the patients of the group B. Microbiological cure was seen in 90 percent patients each of both the study groups. Non-significant results were obtained while comparing the clinical and microbiological efficacy of both the antibiotics in TD patients. In another previous study, 232 patients, 300 mg of ofloxacin given orally twice daily for 5 or 3 days was compared with placebo for the treatment of acute diarrhea in U.S. students visiting Guadalajara, Mexico. The 3-day regimen of ofloxacin was found to be as effective as the 5-day regimen in producing a clinical and microbiologic cure. Clinical cures for patients who received ofloxacin for 5 days occurred in 59 of 66 (89%) subjects, whereas clinical cure occurred in 77 of 81 (95%) of those who received ofloxacin for 3 days and in 56 of 79 (71%) of those who took placebo ($P = 0.0001$). When the duration of diarrhea after therapy was begun was compared in subgroups, a significant (P less than 0.05) shortening of posttreatment illness occurred in comparison with that in the placebo group for the following groups: for 5 days of ofloxacin, cases of shigellosis (32 versus 98 h); for 3 days of ofloxacin, all cases (28 versus 56 h), cases of enterotoxigenic *Escherichia coli* diarrhea (26 versus 66 h), cases of shigellosis (24 versus 98 h), all cases of illnesses associated with a bacterial enteropathogen (28 versus 69 h), and cases of illnesses in which numerous leukocytes were found in stool by microscopy (22 versus 49 h). Microbiologic eradication rates were 75 of 78 (96%) for patients who received ofloxacin and 37 of 46 (80%) for patients who received placebo ($P = 0.009$). There was no significant difference in the number of adverse events reported by patients in either of the treatment groups.¹²

CONCLUSION

Under the light of above mentioned data, the authors concluded that both the antibiotics used in the present study are equally effective in treating patients with TD. However; further studies are recommended.

REFERENCES

1. Hawk D, Tribble DR, Riddle MS. Clinical treatment of nondysentery travelers' diarrhea during deployment. *Mil Med.* 2010;175(3):140–6.
2. Ericsson CD, Johnson PC, Dupont HL, Morgan DR, Bitsura JA, de la Cabada FJ. Ciprofloxacin or trimethoprim-sulfamethoxazole as initial therapy for travelers' diarrhea. A placebo-controlled, randomized trial. *Ann Intern Med.* 1987;106(2):216–20.
3. Riddle MS, DuPont HL, Connor BA. ACG Clinical Guideline: Diagnosis, Treatment, and Prevention of Acute Diarrheal Infections in Adults. *Am J Gastroenterol.* 2016;111(5):602–22.
4. Porter CK, El Mohammady H, Baqar S, Rockabrand DM, Putnam SD, Tribble DR, et al. Case series study of traveler's diarrhea in U.S. military personnel at Incirlik Air Base, Turkey. *Clin Vaccine Immunol.* 2008;15(12):1884–7.
5. Blondeau JM. Expanded activity and utility of the new fluoroquinolones: a review. *Clin Ther.* 1999;21(1):3–40.
6. DuPont HL, Jiang ZD, Ericsson CD, Adachi JA, Mathewson JJ, DuPont MW, et al. Rifaximin versus ciprofloxacin for the treatment of traveler's diarrhea: a randomized, double-blind clinical trial. *Clin Infect Dis.* 2001;33(11):1807–15.
7. Boccumini LE, Fowler CL, Campbell TA, Puertolas LF, Kaidbey KH. Photoreaction potential of orally administered levofloxacin in healthy subjects. *Ann Pharmacother.* 2000;34(4):453–8.
8. Riddle MS, Tribble DR, Putnam SD, Mostafa M, Brown TR, Letizia A, et al. Past trends and current status of self-reported incidence and impact of disease and nonbattle injury in military operations in Southwest Asia and the Middle East. *Am J Public Health.* 2008;98(12):2199–206.
9. De Bruyn G, Hahn S, Borwick A. Antibiotic treatment for travellers' diarrhoea. *Cochrane Database Syst Rev.* 2000;(3):CD002242.
10. Sanders JW, Putnam SD, Riddle MS, Tribble DR. Military importance of diarrhea: lessons from the Middle East. *Curr Opin Gastroenterol.* 2005;21(1):9–14.
11. Scarpignato C1, Rampal P. Prevention and treatment of traveler's diarrhea: a clinical pharmacological approach. *Chemotherapy.* 1995;41 Suppl 1:48-81.
12. DuPont HL, Ericsson CD, Mathewson JJ, DuPont MW. Five versus three days of ofloxacin therapy for traveler's diarrhea: a placebo-controlled study. *Antimicrob Agents Chemother.* 1992 Jan; 36(1): 87–91.