

Comparison of Intravenous Ciprofloxacin and Ceftriaxone in the Management of Spontaneous Bacterial Peritonitis in Cirrhosis of Liver at Mayo Hospital, Lahore

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ABSTRACT

Aim: To compare the efficacy of intravenous ciprofloxacin with ceftriaxone in the management of spontaneous bacterial peritonitis in patients of liver cirrhosis at Mayo Hospital Lahore.

Methods: A total of 240 patients of liver cirrhosis were selected for this study. This study was conducted from January to June 2011 at Department of Medicine, Mayo Hospital Lahore. Patients were randomly allocated in two groups (Group A and B). Patients aged 13 to 60 years of both genders with established liver cirrhosis, diagnosed on ultrasound abdomen were included in this study. Patients with hemorrhagic or malignant ascites, peritonitis, tuberculosis peritonitis, hepatocellular carcinoma and diabetes mellitus were excluded from study. In group A, 120 patients were given intravenous ciprofloxacin 200mg 12 hourly and in group B 120 patients on ceftriaxone 1g 12 hourly. Treatment was given for 5 days and efficacy of treatment was determined by means of evaluating clinical symptoms.

Results: The mean age of the patients in group A was 43.4±10.4 years and in group B was 44.2±10.2 years. In group A there were 84(70%) patients and 88(73.3%) patients in group B in whom spontaneous bacterial peritonitis was settled down.

Conclusion: These results suggest that IV ciprofloxacin is as effective as ceftriaxone in the treatment of spontaneous bacterial peritonitis in cirrhotic patients.

Keywords: Spontaneous bacterial peritonitis, ciprofloxacin, ceftriaxone, liver cirrhosis.

INTRODUCTION

Liver cirrhosis is defined as necrosis of the liver parenchyma followed by fibrosis and regeneration¹. Liver cirrhosis is sequel of chronic hepatitis e.g. chronic hepatitis "B", hepatitis "C", alcohol related liver damage, autoimmune hepatitis and haemochromatosis². Ascites is the most common complication of cirrhosis³.

Due to inadequate defense mechanism cirrhotic patients with ascites have an increased susceptibility to infections, the most frequent and the most severe one being spontaneous bacterial peritonitis (SBP)⁴. Spontaneous bacterial peritonitis is the infection of ascitic fluid in patients with decompensated cirrhosis⁵. It occurs in 10-30% of the patients with Ascites⁶.

Spontaneous bacterial peritonitis involves the translocation of bacteria from the intestinal lumen to the lymph nodes, with subsequent bacteremia and infection of the ascetic fluid. E. coli is the commonest organism followed by streptococcal pneumoniae⁶. Symptoms of infection occur in most patients with spontaneous bacterial peritonitis including fever, abdominal pain, mental status changes and ileus⁵.

A symptomatic spontaneous bacterial peritonitis can be present as first presentation of ascites in chronic liver disease patients⁷. Patients with spontaneous bacterial peritonitis has a mortality rate ranging between 30-50%⁸ early diagnoses and prompt treatment with antibiotic can save patients lives⁹. Different options in antibiotics are ceftriaxone, cefotaxime, ampicillin, ciprofloxacin, ofloxacin and metronidazole.

Cefotaxime or ceftriaxone were considered the first-choice antibiotic for empirical treatment in cirrhotic patients developing spontaneous bacterial peritonitis. It has been suggested that ciprofloxacin could be an alternative to cefotaxime or ceftriaxone in cirrhotic patients developing spontaneous bacterial peritonitis. The resolution of spontaneous bacterial peritonitis was found 80% vs. 83% in intravenous ciprofloxacin and ceftriaxone groups respectively. These results suggest that intravenous ciprofloxacin is as effective as cefotaxime and ceftriaxone in the empirical treatment of spontaneous bacterial peritonitis in cirrhotic patients, and is also less expensive¹⁰.

However, no study has been conducted uptill now to compare the efficacy of third generation cephalosporins (ceftriaxone) and quinolones (ciprofloxacin). The present study is designed to compare the effectiveness of intravenous

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ciprofloxacin and ceftriaxone in the management of spontaneous bacterial peritonitis so as to determine the frequent use of one over the other.

PATIENTS AND METHODS

A total of 240 patients of liver cirrhosis who fulfilled the inclusion criteria were selected from all Medical Wards of Mayo Hospital Lahore. Informed consent was taken for taking part in the study and confidentiality was ensured to all the patients. Demographic characteristics like age and sex were recorded.

Patients aged 13 to 60 years of both genders with established liver cirrhosis, diagnosed on ultrasound abdomen were included in this study. Patients with hemorrhagic or malignant ascites, peritonitis, tuberculosis peritonitis, hepatocellular carcinoma and diabetes mellitus were excluded from study. Liver cirrhosis was confirmed on ultrasound abdomen. Diagnosis of spontaneous bacterial peritonitis was suspected on history and relevant clinically examination as mentioned above and were confirmed on the ascitic fluid routine examination. Patients were randomly allocated in two groups using random number table (Group A and B). In group A, 120 patients were given intravenous ciprofloxacin 200mg 12 hourly and in group B 120 patients on ceftriaxone 1g 12 hourly. Treatment was given for 5 days and efficacy of treatment was determined by means of evaluating clinical symptoms, i.e., decrease in temperature to normal 98.6°F, no abdominal pain, determining the ascitic fluid neutrophil count after consecutive 5 days.

All the collected data was entered into SPSS versions 11 and analyzed. Qualitative variables like sex were presented as frequency and percentage. Quantitative variable like age was presented as mean and standard deviation. The final outcome i.e. resolution of spontaneous bacterial peritonitis (Yes, No) was compared between the two groups by Chi Square test. P<0.05 was considered as significant.

RESULTS

The mean age of the patients in group A was 43.4±10.4 years and in group B was 44.2±10.2 years. In group A, there are 90(75%) male patients and 30(25%) female patient and in group B 83(69.2%) male patients and 37(30.8%) female patients. In the ascetic fluid polymorph nuclear count (AFPC), on day 5 the mean AFPC in group A was 243.9±35.1 cells/cubic millimeter and in group B was 245.7±17.1 cells/cubic millimeter. In the spontaneous bacterial peritonitis settled down, in group A 84(70%) patients in whom spontaneous bacterial peritonitis settled

down and in group B 88(73.3%) patients in whom spontaneous bacterial peritonitis settled down (Table 1).

Table 1: Distribution of patients by spontaneous bacterial peritonitis settled down

SBP settled	Group A	Group B
Yes	84(70%)	88(73.3%)
No	36(30%)	32(26.7%)

p 0.01

DISCUSSION

Due to inadequate defense mechanism cirrhotic patients with ascites have an increased susceptibility to infections, the most frequent and the most severe one being spontaneous bacterial peritonitis (SBP)⁴. Spontaneous bacterial peritonitis is the infection of ascitic fluid in patients with decompensated cirrhosis⁵. It occurs in 10-30% of the patients with Ascites⁶.

Spontaneous bacterial peritonitis involves the translocation of bacteria from the intestinal lumen to the lymph nodes, with subsequent bacteremia and infection of the ascetic fluid. E. coli is the commonest organism followed by streptococcal pneumoniae.⁶ Symptoms of infection occur in most patients with spontaneous bacterial peritonitis including fever, abdominal pain, mental status changes and ileus⁵.

A symptomatic spontaneous bacterial peritonitis can be present as first presentation of ascites in chronic liver disease patients⁷. Patients with spontaneous bacterial peritonitis has a mortality rate ranging between 30-50%⁸. Early diagnoses and prompt treatment with antibiotic can save patients lives⁹. Different options in antibiotics are ceftriaxone, cefotaxime, ampicillin, ciprofloxacin ofloxacin and metronidazole.

Cefotaxime or ceftriaxone were considered the first-choice antibiotic for empirical treatment in cirrhotic patients developing spontaneous bacterial peritonitis. It has been suggested that ciprofloxacin could be an alternative to cefotaxime or ceftriaxone in cirrhotic patients developing spontaneous bacterial peritonitis. The resolution of spontaneous bacterial peritonitis was found 80% vs. 83% in intravenous ciprofloxacin and ceftriaxone groups respectively. These results suggest that Intravenous ciprofloxacin is as effective as cefotaxime and ceftriaxone in the empirical treatment of spontaneous bacterial peritonitis in cirrhotic patients, and is also less expensive¹⁰.

In our study the mean age of the patients in group A was 43.4±10.4 years and in group B was 44.2±10.2 years. As compared with the study of Fransa et al¹¹ the mean age of the patients was 45 years, which is comparable with our study.

In our study, in group A, 75% male patients and 25% female patients. In group B 69.2% male patients and 30.8% female patients. As compared with the study of Fransa et al¹¹ 70% male and 30% female patients, which is comparable with our study.

In our study, in group A, 70% patients in whom spontaneous bacterial peritonitis was settled down and in group B, 73.3% patients in whom spontaneous bacterial peritonitis was settled down. As compared with the study of Tuncer et al¹⁰ the resolution of spontaneous bacterial peritonitis was found 80% vs. 83% in intravenous ciprofloxacin and ceftriaxone groups respectively.

In another study conducted by Fransa et al¹¹ the resolution of SBP on day 5 of treatment of ceftriaxone was achieved in 73% of the patients, which is almost same and comparable with our study.

According to the study of Angeli et al¹² intravenous-oral step-down schedule was possible in 82% patients who received ciprofloxacin; in which 74% patients were discharged before the end of antibiotic treatment and completed it at home.

Eighty patients were allocated to receive ciprofloxacin. Intravenous 200 mg/12 h for 7 days (group A, n= 40) or i.v. 200 mg/12 h during 2 days followed by oral 500 mg/12 h for 5 days (group B, n=40). All patients with spontaneous bacterial peritonitis admitted to the hospital were included. The infection resolution rate was 76.3% in group A and 78.4% in group B¹³.

CONCLUSION

These results suggest that intravenous ciprofloxacin is as effective as ceftriaxone in the treatment of spontaneous bacterial peritonitis in cirrhotic patients, and is also less expensive. Short course (5 days) of intravenous ciprofloxacin and ceftriaxone are useful therapy for SBP. If the polymorph nuclear differential count in ascitic fluid is less than 250 cells/mm³ on day 5 of treatment, the antibiotic can be discontinued.

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