

Compare the Efficacy of Oral Versus Intravenous Medicine in Treatment of Spontaneous Bacterial Peritonitis

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ABSTRACT

Objective: The purpose of this study is to determine whether or not oral medication is more effective than intravenous medication in the treatment of peritonitis caused by bacteria.

Study Design: Comparative study

Place and Duration: Department of Internal Medicine Gangaram hospital Lahore and Medical ward, THQ Hospital Dargai, from October, 2021 to March, 2022.

Methods: There were 102 cases of both genders having spontaneous bacterial peritonitis because of cirrhosis were included. Included patients were aged between 18-60 years. After taking informed written consent, detailed demographics of enrolled cases were recorded. Patients were equally divided in two groups. Group I received intravenous antibiotic in 51 patients and group II received oral antibiotics in 51 patients. Post-treatment outcomes were compared among both groups. SPSS 22.0 was used to analyze all data.

Results: We found that effectiveness in group I was higher 47 (92.2%) as compared to group II 44 (86.3%) but not a significant difference observed. Frequency of mortality in group II was 4 (7.8%) and in group I 3 (5.9%). Diarrhea, nausea, vomiting, rashes and gastrointestinal distress were the most common adverse effects in both groups.

Conclusion: We concluded in this study that the use of antibiotics orally and intravenously for SBP treatment was affective equally. There was no any significant difference observed in both procedures.

Keywords: Cirrhosis, Oral Antibiotics, Intravenous Antibiotics, SBP, Efficacy

INTRODUCTION

Ten percent to thirty percent of cirrhotic patients admitted with ascites develop a life-threatening infection called spontaneous bacterial peritonitis (SBP). [1,2] In patients with SBP, third-generation cephalosporins given intravenously are considered the gold standard for antibacterial therapy. Switch treatment, in which intravenous antibiotics are administered first and then gradually reduced to oral doses, has also been demonstrated to be successful. [3,4] Switch treatment with cipro has been shown to be beneficial in treating both complex and simple SBP by Terg et al., however there was no comparative to an intravenous 3rd cephalosporin in this trial. [5] It was found by Navasa et al. that ofloxacin given orally was just as effective as cefotaxime given intravenously, however this trial only included individuals with uncomplicated SBP. [6] Oral cipro was shown to be equally efficacious as cefotaxime and ciprofloxacin in a recent pilot trial for the management of SBP. [7] However, there has been no randomised controlled experiment contrasting ciprofloxacin switch treatment with third-generation cephalosporin intravenous delivery, despite these findings. This means that the benefits of switching therapy on iv 3rd cephalosporin in the management of SBP, most importantly the decrease in the duration of the hospital stay, have mostly been conjectured up until this point.

In individuals with chronic liver disease, ascites may initially emerge as a sign of a bacterial peritonitis that develops spontaneously. Patients with cirrhosis who developed spontaneous bacterial peritonitis were traditionally prescribed cefotaxime or ceftazidime as an empirical therapy. Ciprofloxacin has been suggested as an alternative to cefotaxime and ceftriaxone for treating spontaneous bacterial peritonitis in cirrhotic individuals. Resolution of spontaneous bacterial peritonitis was observed in 82% of those treated with intravenous ciprofloxacin and in 91% of those treated with ceftriaxone. [8] There is just one bacterium that may cause SBP, and it causes all instances. 8 *Klebsiellapneumoniae* and *Escherichia coli* are examples of gram-negative bacteria found in the gut, whereas gram-positive bacteria are far more numerous (*Streptococcus pneumoniae*, *Enterococcus* species, *viridans streptococci*). SBP is not caused by

microorganisms that thrive without oxygen. When treating cirrhotic individuals for peritonitis, ciprofloxacin is just as effective as ceftriaxone and cefotaxime, but it's cheaper and easier to administer orally. [9]

Third-generation cephalosporins are the preferred and most often used class of antibiotics; cefotaxime is the most widely used agent within this class of antibiotics. However, other agents, such as ceftriaxone and ceftazidime, are just as effective. Antibiotic-prevented infections are more common in patients who are susceptible to Gram-positive bacteria. Recent research has shown that individuals with peritonitis caused by bacteria who receive intravenous albumin had a lower risk of sequelae such hepatorenal syndrome and maybe a much better chance of survival (Kuiper 2007). [10]

The purpose of this research was to compare the effectiveness of intravenous and oral antibiotics in the treatment of SBP. The research intended to improve care and lower death rates.

MATERIAL AND METHODS

This comparative study was conducted at Internal Medicine Gangaram hospital Lahore and Medical ward, THQ Hospital Dargai, from October, 2021 to March, 2022 and comprised of 102 patients of SBP. After taking informed written consent, detailed demographics of enrolled cases were recorded. Patients had peritonitis due to trauma or surgery, <18 years of age and those did not provide written consent were excluded from this study.

Included patients were aged between 18-60 years. The diagnosis of SBP was determined based on the patient's history and physical exam, and diagnostic ascitic fluid aspiration was conducted using a sterile technique and a 20 cc syringe. Using a computer-generated random number table, the patients were split in half (Group I and II). 51 patients in group I were randomly assigned to receive either intravenous ceftriaxone or cefotaxime 8 hourly for five days and oral ciprofloxacin 12 hourly for five days were given in group II. After 5 days of treatment, the patient's clinical symptoms were evaluated to determine whether or not the treatment had been successful. These symptoms included a

reduction in temperature to normal 98.6°F using a thermometer, the absence of abdominal pain using the palpatory method of clinical examination of the abdomen, and an examination of the neutrophil count in 20 cc of ascitic fluid obtained via paracentesis using a sterile method in the hospital laboratory. A performa contained all the data that was gathered.SPSS 22.0 was used to analyze all data.

RESULTS

There were majority males 64 (62.7%) and 45 (37.3%) patients were females.(figure 1)

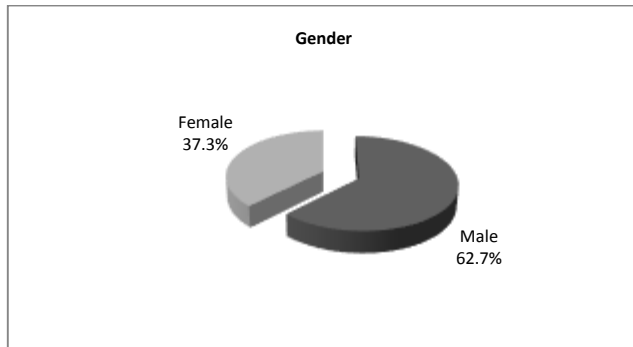


Figure-1: Gender distribution among all cases

Among all cases, 27 (26.5%) had age 18-30 years, 33 (32.4%) had age 31-40 years, 40 (39.2%) had age 41-50 years and 2 (1.96%) had age 51-60 years. Mean BMI of the patients was 25.11±10.40 kg/m² and mean duration of cirrhosis was 3.5±7.18 years. Majority of the cases 57 (55.9%) were from rural areas and 63 (51.96%) patients were not educated.(table 1)

Table-1: Included patients with baseline information

Variables	Frequency	Percentage
Mean BMI (kg/m ²)	25.11±10.40	
Mean time of Cirrhosis (years)	3.5±7.18	
Age		
18-30 years	27	26.5
31-40 years	33	32.4
41-50 years	40	39.2
51-60 years	2	1.96
Residency		
Urban	45	44.1
Rural	57	55.9
Education Status		
Urban	39	40.04
Rural	63	59.96

We found that effectiveness in group I was higher 47 (92.2%) as compared to group II 44 (86.3%) but not a significant difference observed.(figure 1)

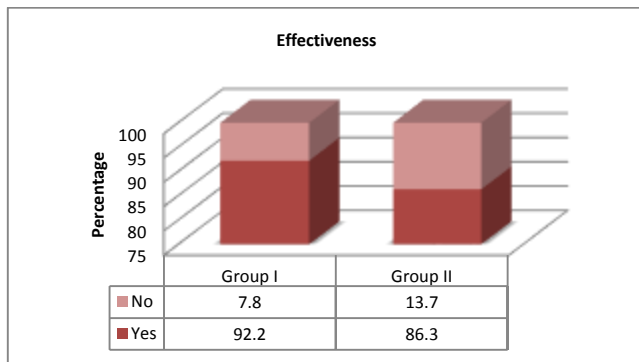


Figure-1: Efficacy to eliminate SBP among both groups

Frequency of mortality in group II was 4 (7.8%) and in group I 3 (5.9%).table 2)

Table-2: Rate of mortality among both groups

Variables	Group I	Group II
Mortality		
Yes	4 (7.8%)	3 (5.9%)
No	47 (92.2%)	48 (94.1%)

After treatment, diarrhea, nausea, vomiting, rashes and gastrointestinal distress were the most common adverse effects in both groups.(table 3)

Table-3: Post-treatment adverse outcomes among both groups

Variables	Group I	Group II
Complications		
diarrhea	4	3
nausea	3	4
vomiting	3	2
rashes	2	1
gastrointestinal distress	5	3

DISCUSSION

Among people with cirrhosis of the liver, SBP is the result of a bacterial infection of the ascetic fluid without any discernible intra abdominal source of infection. A deadly complication of cirrhosis with ascites. Standard therapy cannot prevent the up to 27% death rate from infections that might occur with SBP. Ascites may initially manifest as symptomatic SBP in individuals with chronic liver dysfunction. A patient's life may be saved by an early diagnosis and rapid administration of antibiotic therapy. Antibiotics like ceftriaxone, cefotaxime, ampicillin, ciprofloxacin, ofloxacin, and metronidazole are just some of the choices out there.[11] To cause SBP, bacteria must travel through the lymph nodes from the intestine, causing bacteremia and an infection of the aspirate. Both E. coli and streptococcus pneumoniae are prevalent pathogens. Most patients with SBP also experience the classic signs of infection, such as stomach discomfort, fever, mental status changes, and ileus. [12]

In current study 102 cases of both genders had SBP were included. There were majority males 64 (62.7%) and 45 (37.3%) patients were females. Among all cases, 27 (26.5%) had age 18-30 years, 33 (32.4%) had age 31-40 years, 40 (39.2%) had age 41-50 years and 2 (1.96%) had age 51-60 years. Mean BMI of the patients was 25.11±10.40 kg/m² and mean duration of cirrhosis was 3.5±7.18 years. Majority of the cases 57 (55.9%) were from rural areas and 63 (51.96%) patients were not educated. Previous research present comparable results.[14]

Our research showed that the advantages of oral antibiotics and suppressive therapy are little studied, making their roles in medicine uncertain and difficult to predict. Tenderness, cirrhosis, and ascites are indicators of a more severe infection that often respond better to IV antibiotics. Results from IV antibiotics were reportedly better than those from oral antibiotics in this scenario. Third-generation cephalosporins, which are broad-spectrum antibiotics with few adverse effects, are the best option for managing SBP. Further, as compared to other antibiotics, the risk of nephrotoxicity decreased. [15] Management of peritonitis caused by bacteria with either oral or intravenous antibiotics did not improve outcomes in this investigation. Following up with patients for 4 months, we noticed improved results. Angeli et al found that 82% of patients treated with ciprofloxacin were able to transition to an intravenous-oral step-down plan, and 74% of those patients were able to be discharged early from the hospital and finish their antibiotics at home.[16]

Similar and equivalent results were found in a separate research by Fransa et al, in which 73% of patients had therapeutic effectiveness on day 5 with ceftriaxone.[17] Based on the findings, it can be said that intravenous ciprofloxacin is just as effective as ceftriaxone in treating SBP in cirrhotic individuals.

CONCLUSION

We concluded in this study that the use of antibiotics orally and intravenously for SBP treatment was affective equally. There was no any significant difference observed in both procedures.

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