Spontaneous Bacterial peritonitis in Patients with Liver Cirrhosis and Ascites: Antimicrobial Sensitivity Pattern

Thesis

Submitted in Partial Fulfillment of the Master Degree in Internal Medicine

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2017

Abstract

Background: Spontaneous bacterial peritonitis (SBP) is a common bacterial infection in patients with cirrhosis and ascites requiring prompt recognition and treatment. All patients with cirrhosis and ascites are at risk of SBP and the prevalence of SBP in outpatients is 1.5-3.5% and about 10%-30% in hospitalized patients**.** Half of the episodes of SBP are present at the time of hospital admission while the rest are acquired during hospitalization **.** In-hospital mortality for the first episode of SBP ranges from 10% to 50%, depending on various risk factors**.**

Aims: To identify the most suitable antibiotic to describe for empiric therapy of SBP in Egyptian patients with liver cirrhosis and ascites

Methodology: The study was a cross sectional observational study. Eighty consecutive patients presenting with tense ascites and manifestations of liver cirrhosis were included in the study. Patients were admitted at the Internal Medicine Departments of Ain Shams University Hospital and Ahmed Maher Teaching Hospital during the period between January 2016 and January 2017. All were complaining of abdominal pain, fever, nausea some of them presented with disturbed conscious level, others were asymptomatic.

Results: The study included 80 patients presenting with ascites and clinical manifestations of decompensated liver cirrhosis. They were 50 males (62.5%) and 30 females (37.5%) with a male to female ratio (1.7 : 1). Their age ranging between (50) and (60) years (55.12±5.61).

Conclusion: Any patient with liver cirrhosis and ascites complain of abdominal pain, vomiting, fever or disturbed conscious level should undergo ascetic fluid analysis for PMN cell count and culture\sensitivity.

Keywords: Spontaneous Bacterial, peritonitis in Patients, Liver Cirrhosis, Antimicrobial Sensitivity Pattern

First of all, thanks to Allah whose magnificent help was the main factor in completing this work.

No words can express my deep sincere feelings Towards Prof. Dr. Maha EL Touny, Professor of Internal Medicine, Faculty of Medicine–Ain Shams University for her continuous encouragement, guidance and support she gave me throughout the whole work. It has been a great honor for me to work under her generous supervision.

I would like to express my deepest appreciation, respect and thanks to Dr. Hala Mahmoud Hafez, Assistant Professor of Clinical Pathology, Faculty of Medicine–Ain Shams University, for her continuous guide in all aspects of life beside her great science, knowledge and information.

Finally I would present all my appreciations to Dr. Ahmed Samir Allam, Lecturer of Internal Medicine, Faculty of Medicine – Ain Shams University, for his effort, without him, this work could not have been completed.

Last but not least, sincere gratitude to *My Family* for their continuous encouragement and spiritual support.

سورة البقرة الآية: ٣٢

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List of Abbreviations

AASLD : American Association for the Study of Liver Diseases

CDC : Centers for Disease Control and Prevention

CLSI : Clinical Laboratory Standards Institute

ECDC : European Centre for Disease Prevention and Control

EUCAST :European Committee on Antimicrobial Susceptibility Testing

FDA : Food and Drug Administration

MDR : Multidrug-resistant

MELD : Model for End-Stage Liver Disease

PD : Peritoneal dialysis

PDR : Pandrug-resistant

PELD : Pediatric End-Stage Liver Disease

PMN : Polymorphonuclear neutrophil

PPIs : Proton pump inhibitors

PT : Prothrombin time

SBP : Spontaneous bacterial peritonitis

TIPS : Transjugular intrahepatic portosystemic shunting

VBS : Viridans group streptococci

XDR : Extensively drug-resistant

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Introduction

Spontaneous bacterial peritonitis (SBP) is a common bacterial infection in patients with cirrhosis and ascites requiring prompt recognition and treatment. All patients with cirrhosis and ascites are at risk of SBP and the prevalence of SBP in outpatients is 1.5-3.5% and about 10%-30% in hospitalized patients ***(Fernandez et al., 2000).*** Half of the episodes of SBP are present at the time of hospital admission while the rest are acquired during hospitalization **(*Bajaj et al., 2009).*** In-hospital mortality for the first episode of SBP ranges from 10% to 50%, depending on various risk factors ***(Thuluvath et al., 2001; Nobre et al., 2008).***

The diagnosis of SBP requires paracentesis (aspiration of fluid with a needle) from the abdominal cavity ***(Rimola et al., 2000).*** If the fluid contains bacteria or large numbers of neutrophil granulocytes (>250 cells/µL), infection is confirmed and antibiotics are required to avoid complications. In addition to antibiotics, infusions of albumin are usually administered ***(Rimola et al., 2000).***

Symptoms include fevers, chills, nausea, vomiting, abdominal tenderness and general malaise ***(Lata et al., 2009).*** Patients may complain of abdominal pain and worsening ascites ***(Lata et al., 2009).*** Thirteen percent of patients have no signs or symptoms ***(Koulaouzidis et al., 2009)*** .

SBP is thought to result from a combination of factors inherent in cirrhosis and ascites, such as prolonged bacteremia secondary to compromised host defenses, intrahepatic shunting of colonized blood, and defective bactericidal activity within the ascitic fluid**.** Pharmacologic acid suppression has also been associated with SBP in patients with advanced cirrhosis ***(Bajaj et al., 2009; Gati et al., 2012; Deshpande et al., 2012).***

All people with cirrhosis might benefit from antibiotics (oral fluoroquinolone norfloxacin) if:

- Ascitic fluid protein <1.0 g/dL ***(Moore et al., 2006)***. Patients with fluid protein <15 g/L and either Child-Pugh score of at least 9 or impaired renal function may also benefit ***(Fernández et al., 2007),***
- Previous SBP.

Additionally, the widespread use of quinolones and other antibiotics in the prophylactic treatment of SBP in cirrhotic patients has also favored flora modifications and the development of bacterial resistance, directly affecting the current management of infections in this patient group ***(Fernández et al., 2002; Pleguezuelo et al., 2013).***

Aim of the Study

To identify the most suitable antibiotic to describe for empiric therapy of SBP in Egyptian patients with liver cirrhosis and ascites

Liver Cirrhosis

Cirrhosis is a condition in which the liver does not function properly due to long-term damage. Typically, the disease comes on slowly over months or years. Early on, there are often no symptoms. As the disease worsens, a person may become tired, weak, itchy, have swelling in the lower legs, develop yellow skin, bruise easily, have fluid build up in the abdomen, or develop spider-like blood vessels on the skin. The fluid build-up in the abdomen may become spontaneously infected. Other complications include hepatic encephalopathy, bleeding from dilated veins in the esophagus or dilated stomach veins, and liver cancer. Hepatic encephalopathy results in confusion and possibly unconsciousness ***(O'Shea et al., 2010).***

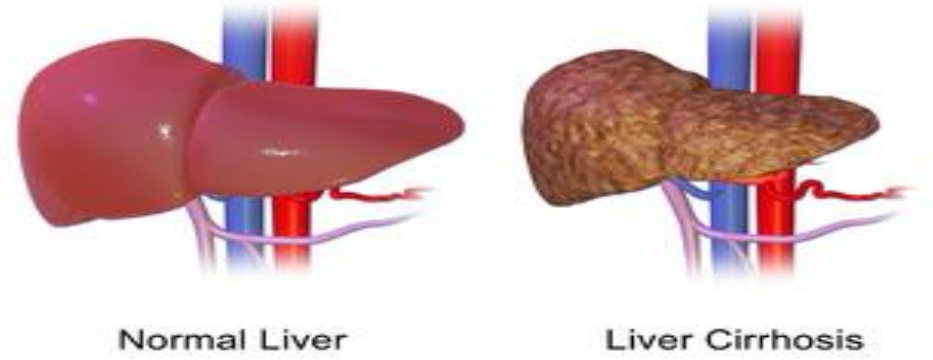

Figure (1): Normal & cirrhotic liver

Cirrhosis is most commonly caused by alcohol, hepatitis B, hepatitis C, and non-alcoholic fatty liver disease ***(O'Shea et al., 2010).***

Cirrhosis resulted in 1.2 million deaths in 2013, up from 0.8 million deaths in 1990. Of these, alcohol caused 384,000, hepatitis C caused 358,000, and hepatitis B caused 317,000. In the United States, more men die of cirrhosis than women. The first known description of the condition is by Hippocrates in the 5th century **(*Brower Steven, 2012).***

Signs and symptoms:

Cirrhosis has many possible manifestations. These signs and symptoms may be either as a direct result of the failure of liver cells or secondary to the resultant portal hypertension. There are also some manifestations whose causes are nonspecific but may occur in cirrhosis. Likewise, the absence of any does not rule out the possibility of cirrhosis. Cirrhosis of the liver is slow and gradual in its development. It is usually well advanced before its symptoms are noticeable enough to cause alarm. Weakness and loss of weight may be early symptoms **(*Friedman, 2014).***

The following features are as a direct consequence of liver cells not functioning:

- Spider angiomata or spider nevi are vascular lesions consisting of a central arteriole surrounded by many smaller vessels (hence the name "spider") and occur due to an increase in estradiol. One study found that spider angiomata occur in about 1/3 of cases **(*Li et al., 1999)***

- Palmar erythema is a reddening of palms at the thenar and hypothenar eminences also as a result of increased estrogen **(*William James, 2005).***

- Gynecomastia, or increase in breast gland size in men that is not cancerous, is caused by increased estradiol and can occur in up to 2/3 of patients **(*Slater et al., 2013).***

- Hypogonadism, a decrease in sex hormones manifest as impotence, infertility, loss of sexual drive, and testicular atrophy, can result from primary gonadal injury or suppression of hypothalamic/pituitary function. Hypogonadism is associated with cirrhosis due to alcoholism and hemochromatosis.

- Ascites, accumulation of fluid in the peritoneal cavity (space in the abdomen), gives rise to flank dullness