

Frequency of Asymptomatic Spontaneous Bacterial Peritonitis in Patients with Decompensated Chronic Liver Disease

Asymptomatic
Spontaneous
Bacterial
Peritonitis

Qazi Sidra Shafi, Mohammad Iltaf, Fazal Wahab, Asma Khan and Saqib Ullah Khan

ABSTRACT

Objective: To determine the frequency of asymptomatic spontaneous bacterial peritonitis (SBP) in patients with decompensated chronic liver disease (DCLD).

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Gastroenterology, PGMI/Hayatabad Medical Complex, Peshawar, from 06-09-2022 to 06-03-2023.

Methods: A total of 164 patients aged 16-75 years, both genders, with DCLD-associated ascites were enrolled. Ascitic fluid samples were collected to identify the presence of SBP through polymorphonuclear (PMN) counts without clinical symptoms of SBP.

Results: The mean age was 56.25 ± 16.68 years, with 53% male and 47% female patients. Among the enrolled patients, 3.7% (n=6) had asymptomatic spontaneous bacterial peritonitis. The most frequent cause of DCLD was hepatitis C (39.6%), followed by hepatitis B (22.6%).

Conclusion: The study found that 3.7% of patients with DCLD had asymptomatic SBP. Screening for SBP in asymptomatic patients is recommended to reduce potential morbidity and mortality associated with this hidden condition.

Key Words: Asymptomatic SBP, Decompensated chronic liver disease, Infection, Child-Pugh class.

Citation of article: Shafi QS, Iltaf M, Wahab F, Khan A, Saqib Ullah Khan. Frequency of Asymptomatic Spontaneous Bacterial Peritonitis in Patients with Decompensated Chronic Liver Disease. Med Forum 2024;35(12):160-163. doi:10.60110/medforum.351235.

INTRODUCTION

Global health experts consider cirrhosis to appear as a significant worldwide medical concern when chronic liver diseases (CLD) cause progressive liver scarring along with fibrosis and impaired liver functioning. The load of cirrhosis creates substantial healthcare effects combined with significant statistical and economic impacts. The 12th position as a cause of death in the United States belongs to cirrhosis while its incidence is expected to rise because of increased hepatitis C infections and cases of non-alcoholic fatty liver disease (NAFLD) and alcohol-related liver disease^[1].

Decompensated chronic liver disease (DCLD) becomes the most dangerous manifestation which causes patients to experience complications including ascites and spontaneous bacterial peritonitis (SBP) as well as

hepatic encephalopathy and variceal bleeding. The infection of ascitic fluid known as SBP proves fatal because it exists without any discernible intra-abdominal bacterial source. Tests reveal that the worldwide SBP occurrence during cirrhosis affects 7-30% of hospitalized patients and about 3.5% of outpatients according to research.^[2-3] The progression toward SBP happens when bacteria migrate from intestines into ascitic fluid through the compromised gut barrier and impaired immune system of patients who have cirrhosis^[4]. The primary infective agents causing spontaneous bacterial peritonitis are gram-negative bacteria primarily consisting of *Escherichia coli* together with gram-positive *Streptococcus* species organisms^[5]. Healthcare providers use two ascitic fluid diagnostic criteria to identify SBP: either when the polymorphonuclear leukocyte (PMN) count exceeds 250 cells/mm³ or when bacteria growth is present during fluid culture analysis^[6]. The symptoms from SBP consist of high fever together with stomach pain and confusion but research shows one-third of patients may not detect any symptoms at all^[7]. The rapid disease evolution of asymptomatic SBP leads to symptomatic infections that result in acute-on-chronic liver failure and sepsis and eventual death without diagnosis according to research^[8]. The research conducted by a researcher revealed that 4% of decompensated liver disease patients presented with asymptomatic SBP yet other studies documented different rates from 3% to

Department of Gastroenterology, PGMI/Hayatabad Medical Complex Peshawar.

Correspondence: Mohammad Iltaf, Associate Professor
Department of Gastroenterology, PGMI/Hayatabad Medical
Complex Peshawar.

Contact No: 03339138429

Email: driltaf414@gmail.com

Received: January, 2024

Accepted: March-April, 2024

Printed: September, 2024

13%^[9,10]. The need for early diagnosis of SBP requires routine diagnostic ascitic taps because undiagnosed SBP presents high rates of morbidity. Secondary antibiotic prophylaxis among cirrhotic patients decreases both the rate of SBP recurrence and enhances their survival rates according to research findings^[11]. There are insufficient data regarding asymptomatic SBP prevalence in Pakistan among patients with decompensated chronic liver disease. The research determines how often asymptomatic SBP appears in DCLD patients when examining its relationship with clinical characteristics that include patient age and gender and Child-Pugh assessment results.

METHODS

Research investigators tested patients at the Department of Gastroenterology, PGMI/Hayatatabad Medical Complex, Peshawar, from September 6, 2022 until March 6, 2023. The research sample included 164 patients who were aged between 16 to 75 years with DCLD-associated ascites through non-probability consecutive sampling. The research excluded patients with peritonitis history and those who had undergone recent abdominal surgery along with those with chronic kidney disease.

Data Collection: The study participants provided consent before the researchers obtained a comprehensive clinical history and performed physical examination. The diagnostic ascitic fluid taps occurred under sterile procedures to assess PMN cell counts in the acquired samples. The research measured both Child-Pugh scores and APRI clinical indicators.

Statistical Analysis: Statistical analysis occurred through SPSS version 24.0 which IBM Corp. operated from its Armonk NY headquarters. The research team determined means and standard deviations for continuous data and counted frequencies of categorical data. The chi-square test ruled associations significant at a p value lower than 0.05.

RESULTS

The analyzed group comprised 164 patients who averaged 56.25 ± 16.68 years old. The patient participants included 87 males who made up 53% of the total while 77 females represented 47% of the total. The primary source of DCLD was Hepatitis C infections that affected 39.6% of patients before Hepatitis B patients who made up 22.6% and people with Wilson’s disease who comprised 12.2% of the total cases. The study participants demonstrated a mean Child-Pugh score of 10.92 ± 2.30 with 72% of patients belonging to Child-Pugh Class C. Results showed that asymptomatic Spontaneous Bacterial Peritonitis affected 3.7% of the 164 patient sample (6 out of 164 patients were affected). The study included 4 male participants who composed 66.7% (n=4) while the remaining 83.3% (n=5) belonged to Child-Pugh Class C. An association

analysis showed that age, gender or etiologies of DCLD did not significantly impact the presence of asymptomatic SBP because the p value exceeded 0.05. Of all unrecognized SBP patients, 66.7% belonged to the age group above 55 years. Most cases of SBP among positive results developed from Hepatitis C infection.

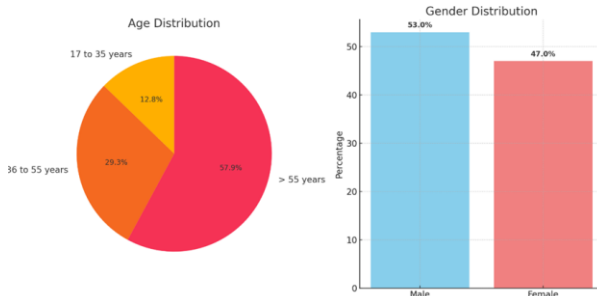


Figure No. 1: Age and Gender Distribution.

Table No. 1: Descriptive Statistics

Variables	Mean	Std. Deviation
Age (Years)	56.25	16.68
Child Pugh Score	10.92	2.3
APRI	1.1	0.26

Table No. 2: Age Distribution

Age Distribution	Frequency	Percent
17 to 35 years	21	12.8
36 to 55 years	48	29.3
> 55 years	95	57.9

Table No. 3: Gender Distribution

Gender	Frequency	Percent
Male	87	53.0
Female	77	47.0

DISCUSSION

The complication called Spontaneous bacterial peritonitis affects patients with decompensated chronic liver disease (DCLD) at rates of 3.7% which produces significant morbidity and mortality results. The occurrence of asymptomatic SBP emerged at 3.7% among patients having DCLD which matches findings documented in previous research reports and studies^[12]. The reported frequency stands lower than other studies which observed up to 13.4% in separate patient groups^[13] due to differing patient demographics and clinician care methods and ascites protein concentration levels. Multiple elements trigger SBP formation among patients who suffer from cirrhosis. SBP develops through bacterial translocation which results from damaged gut bacteria and intestinal barrier breakdown along with weakened host resistance. The paper by a researcher describes how systemic inflammation acts as a factor that increases bacterial translocation outcomes leading to infection risk^[14]. The discovery matches our clinical finding about liver disease patients with advanced stages and poor immune function being more

susceptible to silent SBP infections. Our study showed patients in Child-Pugh Class C had increased occurrence of asymptomatic SBP in comparison to patients in Child-Pugh Class B. The research findings by another researcher show that liver dysfunction severity functions as an excellent indicator of bacterial infections particularly SBP^[15]. The most frequent underlying cause of DCLD which develops into SBP proved to be hepatitis C and hepatitis B infections according to our study results but these findings matched worldwide medical evidence demonstrating viral hepatitis acts as major contributors to cirrhosis-related conditions^[16]. Transparency testing of ascites through routine diagnostic paracentesis stands as a critical practice among cirrhotic patients with ascites since many symptomatic patients demonstrate no apparent symptoms. In an other study, researcher reveals through their research that one-third of patients develop SBP without showing any symptoms yet proper early treatment of this silent condition produces better results. The screening of asymptomatic patients may decrease the occurrence of serious infections together with septic events and death rates. The development of acute kidney injury (AKI) during the course of SBP triggers increased mortality numbers among affected patients. The research done by another researcher found that AKI affected half of SBP patients yet albumin treatment minimized both kidney damage and death rates^[17,18]. The importance of diagnosing cirrhotic patients at early stages emerges from these results since it helps avoid organ failure and enhances long-term survivability. The low occurrence of asymptomatic SBP in our research warrants attention about the potential 70% recurrence rate after the first episode when patients lack proper preventive measures^[16]. The application of norfloxacin prophylaxis decreases infection recurrence alongside improving patient survival rates mainly for high-risk individuals. The clinical implementation of these prevention measures should be done urgently to reduce the disease-related impacts of SBP.

CONCLUSION

The study identified a 3.7% frequency of asymptomatic spontaneous bacterial peritonitis (SBP) in patients with decompensated chronic liver disease (DCLD). Routine diagnostic paracentesis is crucial for early detection and management of asymptomatic SBP, which can help reduce complications such as acute kidney injury and improve long-term patient outcomes.

Limitations: This study was limited by its single-center design, which may affect the generalizability of the findings. Additionally, the relatively small sample size may have restricted the detection of broader trends. Patients excluded due to previous peritonitis history may have introduced selection bias, influencing the prevalence rates of asymptomatic SBP.

Future Findings: Future research should focus on multicenter studies with larger populations to better evaluate regional variations in asymptomatic SBP frequency. Further investigations could explore the role of novel biomarkers for early diagnosis and assess the long-term impact of routine pr

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Qazi Sidra Shafi, Mohammad Iltaf
Drafting or Revising Critically:	Fazal Wahab, Asma Khan, Saqib Ullah Khan
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

Conflict of Interest: The study has no conflict of interest to declare by any author.

Source of Funding: None

Ethical Approval: No.874/B&PSC/2022 Dated 03.08.2022

REFERENCES

1. Peery AF, Crockett SD, Murphy CC, et al. Burden and cost of gastrointestinal, liver, and pancreatic diseases in the United States: update 2018. *Gastroenterol* 2019;156(1):254-272.
2. Tay PWL, Xiao J, Tan DJH, et al. An epidemiological meta-analysis on the worldwide prevalence, resistance, and outcomes of spontaneous bacterial peritonitis in cirrhosis. *Front Med (Lausanne)* 2021;8:693652.
3. Luo WW, Zhang DZ. [Diagnosis and treatment of bacterial infection in patients with end-stage liver disease]. *Zhonghua Gan Zang Bing Za Zhi* 2018;26(1):10-12.
4. Fernández J, Angeli P, Trebicka J, et al. Efficacy of albumin treatment for patients with cirrhosis and infections unrelated to spontaneous bacterial peritonitis. *Clin Gastroenterol Hepatol* 2020;18(4):963-973.e14.
5. Li H, Wieser A, Zhang J, et al. Patients with cirrhosis and SBP: Increase in multidrug-resistant organisms and complications. *Eur J Clin Invest* 2020;50(2):e13198.
6. Fiore M, Maraolo AE, Gentile I, et al. Current concepts and future strategies in the antimicrobial therapy of emerging gram-positive spontaneous bacterial peritonitis. *World J Hepatol* 2017;9(30):1166-1175.
7. Komolafe O, Roberts D, Freeman SC, et al. Antibiotic prophylaxis to prevent spontaneous bacterial peritonitis in people with liver cirrhosis: a network meta-analysis. *Cochrane Database Syst Rev* 2020;1(1):CD013125.

8. Oliveira AM, Branco JC, Barosa R, et al. Clinical and microbiological characteristics associated with mortality in spontaneous bacterial peritonitis: a multicenter cohort study. *Eur J Gastroenterol Hepatol* 2016;28(10):1216-1222.
9. Haj M, Hart M, Rockey DC. Development of a novel clinical staging model for cirrhosis using the Nationwide Inpatient Sample. *J Investig Med* 2018;66(6):992-997.
10. Numan L, Elkafrawy A, Kaddourah O, et al. Spontaneous bacterial peritonitis: we are still behind. *Cureus* 2020;12(4):e7711.
11. Alotaibi A, Almaghrabi M, Ahmed O, et al. Incidence of spontaneous bacterial peritonitis among asymptomatic cirrhosis patients undergoing outpatient paracentesis: a systematic review and meta-analysis. *Eur J Gastroenterol Hepatol* 2021;33(1S Suppl 1):e851-7.
12. Mazloom SS, Khoramian MK, Mohsenian L. Spontaneous bacterial peritonitis in afebrile cirrhotic patients; report from a referral transplantation center. *Bull Emerg Trauma* 2018;6(4):363-366.
13. Singh A, Cresci GA, Kirby DF. Proton pump inhibitors: risks and rewards and emerging consequences to the gut microbiome. *Nutr Clin Pract* 2018;33(5):614-624.
14. Fernández J, Gustot T. Management of bacterial infections in cirrhosis. *J Hepatol* 2019;70(3):491-511.
15. Caly WR, Bitelman B, Carrilho FJ, et al. Clinical features of refractory ascites in outpatients. *Clinics (Sao Paulo)* 2017;72(7):405-410.
16. Moreau R, Elkrief L, Bureau C, et al. Effects of long-term norfloxacin therapy in patients with advanced cirrhosis. *Gastroenterol* 2018;155(6):1816-1827.
17. Wiest R, Albillos A, Trauner M, Bajaj JS, Jalan R. Targeting the gut-liver axis in liver disease. *J Hepatol* 2017;67(5):1084-1103.
18. Li H, Chen LY, Zhang NN, et al. Characteristics, diagnosis and prognosis of acute-on-chronic liver failure in cirrhosis associated with HBV and alcohol. *Liver Int* 2021;41(6):1260-1270.