

Should Antibiotic Prophylaxis Be Continued for Spontaneous Bacterial Peritonitis in Patients with Liver Cirrhosis? An Evidence-Based Analysis.

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ABSTRACT

Spontaneous bacterial peritonitis (SBP) is a serious complication in patients with decompensated cirrhosis. Since 1990, antibiotic prophylaxis has been widely recommended as a preventive strategy, especially with norfloxacin. However, current evidence suggests limited effectiveness in reducing mortality, an increase in resistant infections, and a high recurrence rate, which has led to questioning its net clinical benefit. This review explores the current evidence on the efficacy, risks, and alternatives to antibiotic prophylaxis in SBP.

KEYWORDS: Spontaneous bacterial peritonitis, antibiotic prophylaxis, resistant infections, multi-resistant pathogens, norfloxacin.

ARTICLE DETAILS

Published On:
09 July 2025

Available on:
<https://ijmscrs.com>

I. INTRODUCTION

SBP represents one of the most serious infectious complications in patients with cirrhosis, associated with a mortality rate of up to 40%. These patients are at high risk of developing infection due to endogenous factors such as dysfunction of humoral and cellular immunity. Immune dysfunction and alterations in the intestinal barrier promote bacterial translocation, justifying the historical use of prophylactic antibiotics¹. However, with the growing concern about antimicrobial resistance, it is essential to reevaluate this strategy.

II. HISTORICAL EVIDENCE: BASIS FOR RECOMMENDATION

The double-blind, placebo-controlled study by Ginès et al. (1990) included 80 patients and demonstrated a reduction in SBP recurrence with norfloxacin, with no impact on mortality or the overall incidence of infections. Despite its limited sample size, this trial has supported secondary antibiotic prophylaxis for decades. Clinical guidelines such as the American Association for the Study of Liver Diseases (AASLD), among others, still recommend this practice¹.

The incidence of infections caused by multidrug-resistant (MDR) bacteria has increased substantially in recent years, rising 100% when comparing data from studies conducted between 2002 and 2011. In the most recent analysis, MDR infections accounted for between 18% and 23% of bacterial isolates. The main risk factors identified

include prior exposure to healthcare facilities, nosocomial or healthcare-associated infections, prophylactic use of norfloxacin, recent use of other antibiotics, and a history of infection with resistant microorganisms. It is noteworthy that initial empirical treatment has been ineffective in approximately 90% of these cases².

III. IMPACT OF PROPHYLAXIS ON ANTIMICROBIAL RESISTANCE

Several studies have documented that patients with cirrhosis receiving fluoroquinolone prophylaxis, especially norfloxacin, have a significant increase in colonization by multidrug-resistant microorganisms, including carbapenem-resistant Enterobacteriaceae. This colonization not only increases therapeutic difficulty in the event of infection but is also associated with higher mortality^{1,2}.

In a cohort of more than 7,000 patients, those receiving primary prophylaxis for SBP were 2.43 times more likely to develop an infection caused by fluoroquinolone-resistant organisms, in addition to a significantly longer hospital stay ($p < 0.01$)³.

Doubtful efficacy of secondary prophylaxis

Despite being considered a solid indication, secondary prophylaxis has also shown significant limitations. Two large cohorts, including more than 11,000 patients in total, demonstrated that those who received secondary prophylaxis after a first episode of SBP had a

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higher rate of infection recurrence compared to those who did not receive prophylactic treatment⁴.

Even after adjusting for clinical variables and liver disease severity, the use of secondary prophylaxis was associated with a 63–68% increase in SBP recurrence, with no reduction in short- or medium-term mortality⁴.

IV. AMBIGUOUS EVIDENCE IN META-ANALYSES AND CLINICAL TRIALS

The most recent Cochrane review, based on 29 studies with low-certainty evidence, found no significant differences in mortality or serious adverse events when comparing antibiotic prophylaxis versus placebo. Although modest benefits were observed with certain sulfonamides and rifaximin, the findings are inconclusive^{5,6}.

Rifaximin, compared with norfloxacin, showed better results in some recent studies, especially in secondary prevention, thanks to its broad spectrum and low resistance profile. However, its efficacy still requires validation in high-quality trials^{5,6}.

V. TOWARD A MORE PERSONALIZED APPROACH

Given the changing bacterial epidemiology, the high rate of antimicrobial resistance, and the lack of clear mortality benefits, several experts propose abandoning universal prophylaxis, even in patients with traditional indications. Instead, they suggest individualizing the decision based on clinical risk, local resistance context, and life expectancy.

Furthermore, non-antibiotic strategies, such as modulating the gut microbiota and reducing portal pressure, are being explored to prevent SBP without the adverse effects of prolonged antibiotic therapy^{5,7}.

CONCLUSIONS

Antibiotic prophylaxis in patients with cirrhosis and at risk of SBP should be reconsidered in light of current evidence. While it has historically been a valuable preventive tool, its clinical utility is increasingly being questioned due to the changing epidemiology of pathogens involved in the infection, as well as antimicrobial resistance, serious adverse effects, and the lack of impact on mortality. In this context, it is prudent to adopt a highly individualized approach and avoid prolonged antibiotic use in the absence of a clear indication supported by solid evidence.

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