Review: Antibiotic prophylaxis reduces mortality and bacterial infection in cirrhosis and gastrointestinal bleeding

QUESTION

In patients with cirrhosis and gastrointestinal (GI) bleeding, how effective is antibiotic prophylaxis in reducing bacterial infection and mortality?

DATA SOURCES

Studies were identified by searching MEDLINE (1966 to 2001), EMBASE/Excerpta Medica (1980 to 2001), the Cochrane Library, and the Cochrane Hepato-Biliary Group Controlled Trials Register; scanning the references of all retrieved studies; and by contacting authors and experts in the field.

STUDY SELECTION

Studies were selected if they were randomized controlled trials (RCTs) comparing antibiotic therapy with placebo, no treatment, or another antibiotic to prevent bacterial infections in adults with cirrhosis of the liver and GI bleeding.

DATA EXTRACTION

3 reviewers assessed study quality (allocation concealment, blinding, sample size, and follow-up). 2 reviewers independently extracted data on trial characteristics; patient characteristics; antibiotic type, dose, method of administration, schedule, follow-up, and duration; and outcomes. Main outcomes were mortality and bacterial infection.

MAIN RESULTS

8 RCTs (864 patients) comparing antibiotics with placebo or no treatment were included. 8 RCTs showed a reduction in mortality in patients who received antibiotic prophylaxis (Table). 3 RCTs showed a nonsignificant reduction in mortality from bacterial infections (relative risk [RR] 0.31, 95% CI 0.09 to 1.04). 8 RCTs showed a reduction in bacterial infection in patients who received antibiotics (Table). Antibiotic prophylaxis reduced bacteremia (6 RCTs, n = 650, RR 0.26, CI 0.15 to 0.43), pneumonia (6 RCTs, n = 761, RR 0.49, CI 0.29 to 0.84), spontaneous bacterial peritonitis (6 RCTs, n = 650, RR 0.31, CI 0.15 to 0.36), and urinary tract infections (6 RCTs, n = 761, RR 0.23, CI 0.12 to 0.43). 3 RCTs (n = 503) that compared one antibiotic regimen with another showed no differences for mortality or bacterial infection.

CONCLUSION

In patients with cirrhosis and gastrointestinal bleeding, antibiotic prophylaxis reduces bacterial infection and mortality.

Antibiotic prophylaxis vs placebo or no treatment for cirrhosis and gastrointestinal bleeding*

Outcomes†	Weighted event rates		RRR (95% CI)	NNT (CI)
	Antibiotics	Placebo or no treatment		
Mortality	15.5%	22%	27% (5 to 45)	16 (9 to 91)
Bacterial infection	16%	42%	60% (49 to 68)	4 (4 to 5)

*Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article using a fixed-effects model.
†Follow-up period ranged from 24 hours to 30 days.

COMMENTARY

Acute variceal bleeding is associated with a 20% to 40% in-hospital mortality rate (1). Although endoscopic therapy (e.g., variceal band ligation and sclerotherapy) and vasoactive agents (e.g., terlipressin, octreotide, and somatostatin) are widely used to treat variceal bleeding, it is uncertain whether these interventions reduce mortality (2).

Bacterial infections are common in cirrhotic patients presenting with variceal bleeding and are associated with a 5-fold increase in mortality (3), making routine antibiotic prophylaxis an attractive option. The well-designed meta-analysis by Soares-Weiser and colleagues suggests that antibiotic prophylaxis reduces mortality by an absolute 6.5% and the incidence of bacterial infections by an absolute 26%. Little difference in efficacy existed among various antibiotics; quinolones were the most frequently used antibiotic group.

We share the concerns of the authors of the meta-analysis regarding the possibility of bias: None of the 11 included studies was blinded; in fact, only 1 study used placebo in the control group. None of the studies described adequate allocation concealment, and after the authors of the studies were contacted, it was concluded that only 3 studies used adequate allocation concealment. Funnel plots suggested the possibility of publication bias. Furthermore, interpretation of the mortality results is hindered by the relatively short and varied follow-up periods (24 h to 30 d).

Antibiotic prophylaxis in acute variceal bleeding seems promising, but the strength of the evidence presented in this meta-analysis is limited by the possibility of bias in the included studies. Future RCTs should use double-blind designs and adequate allocation concealment and should have longer follow-up.

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References

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