Spontaneous Bacterial Empyema is Associated with Increased Mortality and Liver Transplant Has Survival Benefit: A Systematic Review and Meta-Analysis

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Introduction

- Spontaneous bacterial empyema (SBE) is an infection of a pre-existing hepatic hydrothorax in patients with cirrhosis. It is rarely reported in the literature and the prognostic significance of SBE is not clearly illustrated.
- Liver Transplant (LT) has been suggested to have a survival benefit in patients with SBE, however, this has been limited by small sample size studies.

Aim

The aim of this study was to perform a systematic review and meta-analysis to evaluate the effect of SBE on mortality and the survival benefit that LT may provide.

Methods

- A comprehensive search of several databases from each database's inception to December 2021 was conducted.
- Studies included in the systematic review met the following inclusion criteria: adult patients (age >18 years), with a diagnosis of SBE. Manuscripts with <5 patients were excluded from the study.
- The databases included Ovid MEDLINE®, Ovid EMBASE, and Google Scholar. Outcomes of interest were mortality and LT. Data synthesis was obtained using random-effects metanalysis and reported as risk ratio (RR) with 95% confidence intervals (CIs). Heterogeneity was assessed using I2 statistics.

Results

- After excluding duplicates, 257 unique titles were screened, ultimately including 3 retrospective cohort studies (Fig A). Study characteristics are shown in the Table.
- Two studies reported mortality as an outcome, with a total of 34 patients with SBE compared to 909 patients without SBE.
- SBE is significantly associated with increased mortality (RR 1.66, 95% CI 1.06-2.59, I2=6%) (Fig B).
- All studies included reported outcomes of LT. Fifty patients with SBE were included, of which 12 (24%) patients who received a LT had no mortality reported at last follow up. LT was significantly associated with reduced mortality (RR 0.13, 95% CI 0.03-0.58, I2=0%) (Fig.C)

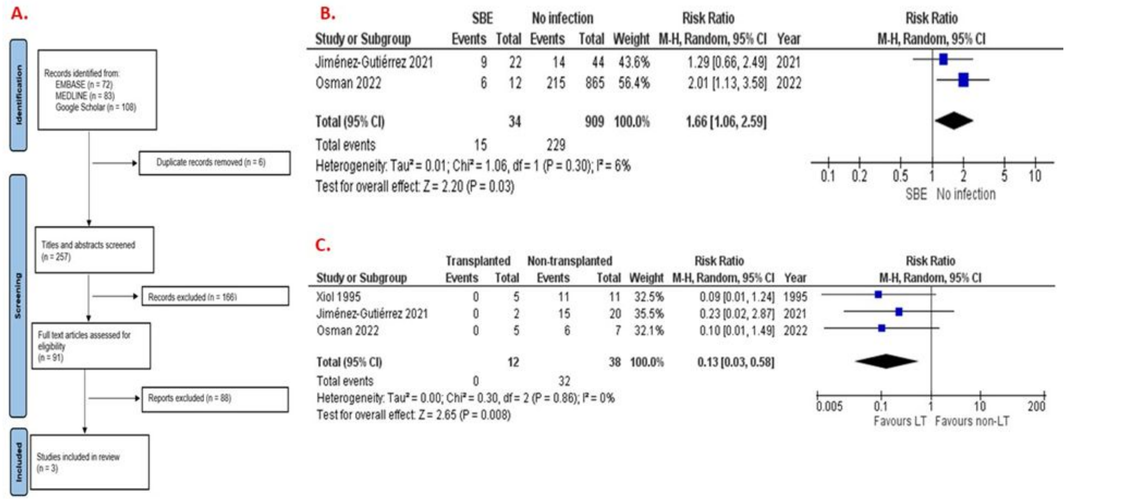
Conclusion

Patients who develop SBE have a higher risk of mortality. LT may provide a survival benefit in patients with SBE. More studies with larger sample sizes are needed to validate our findings.

Table: Baseline characteristics of patients with SBE in the literature

Study (year); Location	Age	Females	Etiology of Cirrhosis; Alcohol/Viral/ Other	MELD Score	MELD-Na Score	CTP classification: A/B/C (n)	CTP score
Osman (2022); United States of America	53.42 ± 10.11	3 (25.00%)	5/4/3	27.00 ± 5.75	28.92 ± 6.23	0/4/8	11.17 ± 1.85
Jiménez-Gutiérrez (2021); Mexico	58.00 (52.00–64.00)	11 (50.00%)	3/5/14	16.00 (12.20–17.80)	21.50 (17.20–26.00)	0/10/12	0.00 (8.00–11.00)
Xiol (1996); Spain	NR	NR	NR	NR	NR	NR	11 (10.00–11.25)

Figure



(A) Flowchart of the literature review. (B) Forest plot showing that SBE was associated with increased mortality. (C) Forest plot showing that LT was associated with lower mortality among patients with SBE.