Nosocomial vs Healthcare-associated vs Community acquired SBP- A systematic review and meta-analysis

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Introduction: Spontaneous bacterial peritonitis (SBP) is a common complication in decompensated liver cirrhosis. SBP is defined as ascitic fluid polymorphonuclear cell count > 250/mm3. Community acquired SBP (CA-SBP) occurs within 48-72 hours after hospital admission. Healthcare associated SBP (HA-SBP) is defined as SBP occurring in patients who were hospitalized in the preceding 90 days to months. Nosocomial SBP (N-NBP) occurs 48-72 hours after hospital admission.

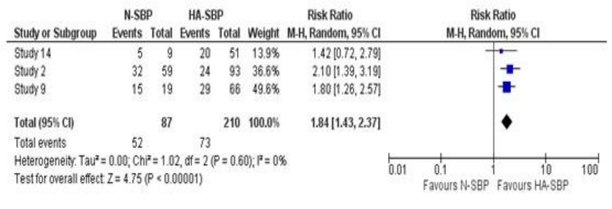
Methods: We conducted a systematic review and meta-analysis on the studies that compared N-SBP, HA-SBP and CA-SBP. We performed a comprehensive database search in PubMed, Embase and Web of Science from inception through May 18, 2022. Randomized controlled trials, prospective and retrospective cohort studies and case series were included. The primary outcome was mortality rate in all types of SBP. Secondary outcome was resistance to third generation cephalosporins. The random effects model was used to calculate the risk ratios (RR), mean differences (MD) and confidence intervals (CI). A p value <0.05 was considered statistically significant. Heterogeneity was assessed using the Higgins I2 index.

Results

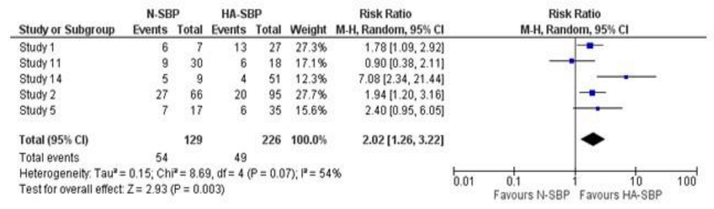
Fourteen retrospective and prospective cohort studies comprising of 2302 SBP episodes were included. The mortality rate was statistically significantly higher in N-SBP compared to HA-SBP (RR 1.84, p<0.0001, CI 1.43-2.37, I2=0%) and CA-SBP (RR 1.69, p<0.00001, CI 1.4-1.98, I2= 33%), but not statistically significant between HA-SBP and CA-SBP (RR=1.40, p=0.34, CI=0.71-2.76, I2=53%).

Resistance to third generation cephalosporins was statistically significantly higher in N-SBP compared to HA-SBP (RR=2.02, p=0.003, CI 1.26-3.22, I2=54%) and CA-SBP (RR=3.96, p<0.00001, CI=2.50-3.60, I2=52%) and also between HA-SBP and CA-SBP (RR=2.25,p=0.002, CI=1.33-3.81, I2=0%).

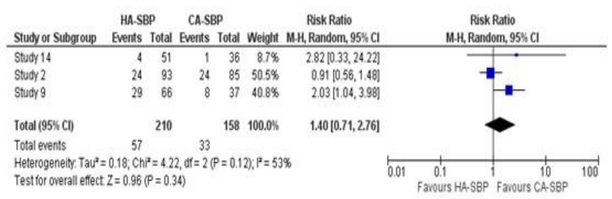
Mortality rate between N-SBP and HA-SBP



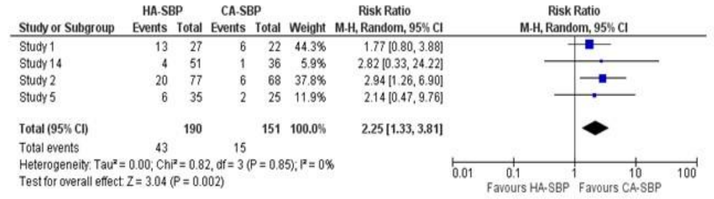
3rd generation cephalosporin resistance between N-SBP and HA-SBP



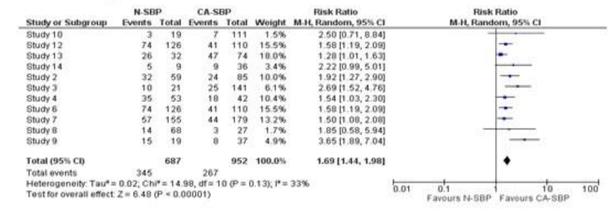
Mortality rate between HA-SBP and CA-SBP



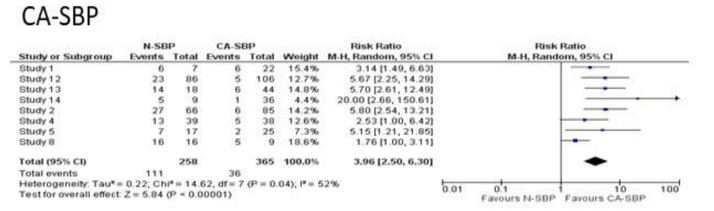
3rd generation cephalosporin resistance between HA-SBP and CA-SBP



Mortality rate between N-SBP and CA-SBP



3rd generation cephalosporin resistance between N-SBP and CA-SBP



Conclusion

Our meta-analysis demonstrated that mortality rate is higher in N-SBP compared to HA-SBP and N-SBP compared to CA-SBP. Third generation cephalosporin resistance is considerably higher in N-SBP and HA-SBP compared to CA-SBP. Lower threshold to start broad spectrum antibiotics with targeted therapy guided through culture data should be undertaken for appropriate treatment of SBP and to improve mortality in N-SBP and HA-SBP.