Activity of piperacillin/tazobactam against extended-spectrum \( \beta \)-lactamase-producing and non-producing \textit{Escherichia coli} clinical strains

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Background and purpose:
Urosepsis is associated with a mortality rate of 20-40% in critically ill patients (1). Data is sporadic whether piperacillin/tazobactam (PTZ) remains effective against ESBL-producing \textit{E. coli} (ESBL-EC) urosepsis. This study aims to evaluate the activity of PTZ regimens against ESBL-producing and non-producing \textit{E. coli} to suggest therapeutic option for urosepsis.

Methods:
- Three ESBL-producing (\( \text{bla}_{\text{CTX-M-15}} \)) and two ESBL-non-producing \textit{E. coli} clinical strains were obtained from national antimicrobial resistance surveillance, Bangladesh.
- PTZ standard regimens were simulated in a dynamic hollow-fibre infection model over 7-days.

Results:
- PTZ regimens resulted in approximately 4-log\(_{10}\) and ≥ 4-log of initial bacterial killing against ESBL-producing \textit{E. coli} strains, respectively by 8 h.
- These results suggest, piperacillin/tazobactam could be an effective choice for the treatment of ESBL-EC urosepsis where there is a non-biofilm source of pathogen.

Conclusion:
- PTZ regimens resulted in approximately 4-log\(_{10}\) and ≥ 4-log of initial bacterial killing against ESBL-producing and ESBL-non-producing \textit{E. coli} strains, respectively by 8 h.
- These results suggest, piperacillin/tazobactam could be an effective choice for the treatment of ESBL-EC urosepsis where there is a non-biofilm source of pathogen.