Beta-Lactam-Resistant Salmonella enterica Strains

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ABSTRACT

Background and objectives: Salmonellae infection is one of the most important foodborne diseases. Antimicrobial drug resistance is increasing among Salmonella species. The main objective of this study was to investigate the prevalence and molecular characterization of ESBL genes in Salmonella enterica isolates from Iran.

Material and methods: Salmonella species strains were isolated from several hospitals in Tehran. The isolates were identified by standard biochemical tests and agglutination using specific antisera. Antimicrobial susceptibility testing was performed according to the Clinical and Laboratory Standards Institute (CLSI). The presence and characterization of ESBL genes in Salmonella enterica isolates were investigated by PCR and sequencing.

Results: In total, 4.3% of Salmonella enterica isolates showed an ESBL-positive phenotype. Three strains were attributed with serotype Enteritidis and three with serotype Infantis. bla_{CTX-M} sequences were detected in all Salmonella strains, whereas bla_{TEM} was observed in four isolates including two Enteritidis and two Infantis. The ISEcp1 insertion sequence that has been implicated in the expression and mobilization of the bla_{CTX-M} genes has been also detected in all ESBL positive isolates.

Conclusion: Proper detection of β-lactamases and corresponding treatment strategies are of paramount importance in curtailing this growing epidemic. Prevention and control strategies should be urgently implemented to stop further spreading of these strains.

Keywords: Salmonella enterica, β-lactamase, Antimicrobial drug resistance