

Incidence of potential β -lactam resistance genes and related mobile genetic elements in uropathogenic *Escherichia coli* from pregnant women from Kolkata

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Uropathogenic *Escherichia coli* (UPEC) infection is very common in pregnancy. Antimicrobial resistance (AMR) in UPEC especially against β -lactams, limits treatment options. In this study prevalence of β -lactam resistance (BLR) and associated genetic determinants was investigated in UPEC collected from pregnant women to delineate the underlying cause of AMR and thus design efficacious and safe therapeutics during pregnancy. All the UPEC isolates exhibited the highest resistance against ampicillin (100%). Phenotypically confirmed ESBL, BLIR and carbapenemase producing isolates were 63.64, 36.33 and 33.33%, respectively. Molecular studies showed co-occurrence of β -lactamase genes; bla_{OXA-1} , bla_{OXA-II} , $bla_{OXA-III}$, bla_{TEM} , bla_{CTXM} , bla_{NDM} , bla_{OXA-48} in different combinations with significant ($P < 0.05$) occurrence of bla_{TEM} and bla_{TEM} , bla_{CTXM} combination in multiple-replicon plasmids with predominance of IncFrepB and IncF1B, followed by IncX. Heatmaps showed that the UPECs belonged to two discrete clusters with respect to the presence and absence of bla_{TEM} . UPEC isolates with bla_{TEM} exhibited the highest occurrence of different combinations of integrons (*int1*, *int2*) and insertion elements (IS5, *ISEcp1*, IS26), although their presence was statistically significant ($P < 0.05$) in bla_{TEM} negative isolates. Therefore, this is the first report from India, that demonstrated co-occurrence of potential β -lactamase genes and associated mobile genetic elements in UPEC from pregnant females and demands a necessity of comprehensive surveillance to formulate appropriate therapeutics to protect both maternal and fetal health.

Keywords: Antimicrobial resistance, Insertion elements, Integrons, Multidrug resistance, Plasmid replicon typing, Urinary tract infections (UTIs)