

Prevalence of Class I Integrons among EPEC Strains Isolated from Children in Tehran

Fatemeh Rahmati Ghezalgeh*; Fereshteh Shahcheraghi; Mohammad Mehdi Aslani; Fahimeh Shooraj; Seyed Fazlollah Mousavi; Elham Torabi

Microbiology Research Center, Department of Bacteriology, Pasteur Institute of Iran, Tehran, Iran
rahmatig@yahoo.com

Background & Objectives: Diarrheagenic *Escherichia coli* (DEC) remain one of major cause of morbidity and mortality among children worldwide. Among six type of DEC, Enteropathogenic *Escherichia coli* (EPEC) is the predominant agent cause of diarrhea in infant. Recently, therapeutic options for diseases caused by *E.coli* have limited because of the spread of antimicrobial resistance strains. In this study we investigated the presence of virulence factors among EPEC strains, and studied their resistant patterns. We analyzed the presence of class I integrons in EPEC strains.

Methods: This study included 70 EPEC strains were isolated from children between 2007 and 2011. After identification of isolates using standard methods, antimicrobial resistance patterns were used by disk diffusion methods. Minimum inhibitory concentration of kanamycin and tetracycline were determined by broth microdilution methods. All strains were examined using detection of virulence factors (*eaeA*, *bfpA*) by PCR. A conserved sequence of 5' and 3' of class I integrons and *intI* gene amplified to investigate the presence of integrons and gene cassette in resistant strains.

Results: Presence of *eaeA* gene was confirmed in all 70 strains. Two isolates had *bfpA* gene and classified as typical EPEC. Antimicrobial susceptibility tests showed that 4 (5.7%), 3 (4.2%), and 2 (2.8%) isolates were resistant to ampicillin, trimethoprim-sulfamethoxazole, and ceftazidime, respectively. Resistant rates to ciprofloxacin and aztreonam were 1.4%. Thirteen (18.5%) isolates were tetracycline resistant ($MIC \geq 16 \mu g/ml$), and 4 (5.7%) isolates were kanamycin resistant ($MIC \geq 64 \mu g/ml$). All isolates were susceptible to gentamicin and cefepime. Class I integron detected in 22 (31.4%) isolates. Majority (77.2%) of the gene cassettes found in class I integrons corresponded to different variants of *aadA* genes.

Conclusion: Diarrhea outbreaks are major public health problem for children. Most EPEC isolates in this study have *eaeA* gene (but no *bfpA* gene). These results showed high frequency of atypical EPEC strains among children in Iran. Prevalence of class I integrons in EPEC strains was high. Presence of *aadA* gene cassettes (conferring resistance to streptomycin) in integrons represents high distribution of resistance determinants in EPEC strains.

Keywords: EPEC; Class I Integrons; Children