

## Determination of Phylogenetic Group and Prevalence of *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-M-15</sub> Genes in *Escherichia Coli* Isolates from Intestinal and Urinary Tract Infections in under Five- Year- Old Children

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### Abstract

**Background and Objective:** CTX-M type extended spectrum beta-lactamases is a rapidly expanding group of enzymes encountered with increasing frequency, especially, in *Escherichia coli* (*E. coli*). There are a few reports on phylogenetic background of *E. coli* isolates from clinical sources of under five-year- old children in Iran. The purpose of this study was phylotyping of *E. coli* isolates having *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-M-15</sub> genes from under five-year- old children with diarrhea and urinary tract infection (UTI).

**Material and Methods:** A total of 121 *E. coli* isolates (75 diarrheas and 46 UTI) were obtained and identified as *E. coli* based on standard bacteriological tests. DNA was extracted from *E. coli* isolates by alkaline lysis method. PCR assay was used because of high frequency of *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-M-15</sub> genes in the isolates and also determination of phylogenetic group/subgroups by detection of *yjaA* and *chuA* genes and fragment TspE4.C2.

**Results:** The isolates belonged to four phylogenetic groups A (48.77%), B1 (14.04%), B2 (11.57%), and D (25.62%). In the diarrheic isolates, 17.37% were positive for *bla*<sub>CTX-M</sub> and 14.04% of isolates possessed both *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-15</sub> genes. Out of 46 UTI isolates, 21.73% were positive for *bla*<sub>CTX-M</sub> and 15.21% for *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-M-15</sub> genes.

**Conclusion:** A rather high prevalence of *E. coli* isolates with *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-M-15</sub> genes was observed in fewer than five-year- old children in Khoramabad city. Phylotyping of isolates possessing *bla*<sub>CTX-M</sub> and *bla*<sub>CTX-15</sub> genes showed that most of them belong to A and D phylo-groups.

**Keywords:** *Escherichia Coli*, Phylogenetic Group, Extended-Spectrum Beta-Lactamase