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Comparison of phylogenetic groups, antibacterial resistance and integron containment of *Escherichia coli* from initial episode of childhood urinary tract infections with different outcomes

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Urinary tract infection (UTI) caused by *Escherichia coli* is one of the most common bacterial infections in childhood. It has been estimated that up to 40% of patients suffering from UTI have recurrences after a primary infection.

Objectives: The aim of our study was to characterize the phylogenetic groups, antibiotic resistance and containment of class 1 integrons of *E. coli* in the first attack of pyelonephritis of recurrent urinary tract infections (RUTI) compared to a single pyelonephritis episode in children.

Material and methods: Altogether 48 urine *E. coli* isolates from 25 patients (5 boys and 20 girls; 2 months to 120 months old with a median age of 38 months) with an initial episode of acute community acquired pyelonephritis of RUTI and from 23 patients (5 boys and 18 girls; 1 month to 122 months with a median age of 24 months) with a single pyelonephritis episode were studied.

The total DNA of the *E. coli* was extracted using a QIAamp DNA Mini Kit (Qiagen, Germany) following the manufacture's protocol. *E. coli* phylogenetic groups were determined by triplex polymerase chain reaction (PCR). The minimal inhibitory concentrations (MIC) for testing antibacterial resistance to ampicillin, cefuroxim, cefotaxim, TMP-SMX, gentamycin and ciprofloxacin were detected by E-test (Biomerieux, France). The presence of class 1 integrons was studied by amplification of a class 1 integrase-specific fragment of the *intl* gene using PCR.

Results: The most frequent phylogenetic group was B2 both in case of RUTI and UTI (17/25 vs 15/23). The presence of integrons was higher in RUTI B2 strains than in UTI (15/17 vs 8/15, p=0.049). Initial *E. coli* strains of RUTI contained more integrons (21/25 vs 9/23, p=0.003) and resistance to cefuroxim (11/25 vs 0/23; p<0.001) was higher if compared to single UTI strains. The probability for recurrences can be predicted if the initial strain is either integron positive (OR=7.15 CI 1.86-27.80) or cefuroxim resistant and moderate resistant (OR=34.87 CI=1.91-635.78).

In conclusion: The phylogenetic group B2 prevails in initial episodes of RUTI and UTI. The class 1 integron positivity and resistance to cefuroxime are characteristic to *E. coli* strains that tend to give later recurrences in children.