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Antimicrobials: Resistance surveillance

Antibiotic susceptibility of *E. coli* strains related to community-acquired urinary tract infections

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Objectives: Urinary tract infection (UTI) is the most frequently diagnosed urologic disease, and *Escherichia coli* is the most common etiological agent. The aim of this study is to evaluate the antibiotic resistance of *E.coli* strains isolated in the community-acquired UTIs, and to determine the prevalence of extended-spectrum b-lactamase (ESBL) producing strains in the community.

Methods: During the study period 2008-2013, a total of 1821 *E.coli* isolates were collected from outpatients suffering from community-acquired UTIs at a tertiary care teaching hospital in Kirsehir, Turkey. Clinical and demographic information was obtained from medical records. UTIs were defined as the culture of organisms up to two species from a midstream urine specimen at 10^5 colony forming units per mililiter. Urine samples were cultured in EMB agar and blood agar base. Strain identification and antimicrobial susceptibility of the strains was performed using VITEK-2 Compact automated system (bioMerieux, France). Additionally, Kirby-Bauer disk diffusion test was perfomed according to CLSI, for the antimicrobials ampicillin (AMP), amoxicillin-clavulanic acid (AMC), cephalotin (CF), ciprofloxacine (CIP), co-trimoxazole (SXT), ceftriaxone (CRO), cefotaxime (CTX), fosfomycin (FOF), nitrofurantoin (NIT), gentamicin (GEN), amikacin (AK), piperacillin-tazobactam (TPZ), imipenem (IMP) (Bioanalyse). Additionally, ESBL production of the strains were examined by CTX-CL and CAZ-CL disks.

Results: A total of 2203 *E.coli* strains were recovered from patients suffering from UTI, of whom 1821 (82.7%) had community-acquired and 382 (17.3%) had healthcare-associated. Among CA-*E.coli* strains 449 (24.7%) were ESBL-producer. Isolates presenting susceptibility to the antibiotics evaluated are shown in the table. Percentage of ESBL-producer strains were increased from 10.7% to 32.5% between the years 2008 to 2013.

Conclusions: The increasing prevalence of infections caused by ESBL-producer *E.coli* makes the empirical treatment of UTIs more difficult. A remarkable increase in ESBL carriage is alarming in our population especially over the age group of 51 years. Treatment with CIP, SXT and GEN should be considered cautiously due to the high resistance rates over 50% among ESBL-producers. According to the results of this study, fosfomycin or nitrofurantoin are recommended for the first-line empirical oral treatment of community-acquired uncomplicated UTIs.

Table. *E.coli* and ESBL-positive *E.coli* isolates recovered from community-acquired UTIs presenting susceptibility to antibiotics.

	(%) Susceptibility to											
Bacterial strain	**AMP**	**AMC**	**GEN**	**AK**	**CF**	**CRO/ CTX**	**TPZ**	**CIP**	**SXT**	**IMP**	**FOF**	**NIT**
E.coli	42.2	66.1	91	99.5	96.2	100	98.9	84.4	64.9	100	99.3	99.3
ESBL (+) *E.coli*	-	94.2	50.1	90.9	-	0.7	86.4	37.9	40.8	99.1	95.8	95.8
Total	31.8	87.3	80.9	97.4	72.6	75.5	95.8	72.9	58.9	99.8	98.5	98.4

Amp= Ampicillin, AMC= Amoxicillin-clavulanic acid, GEN= Gentamicin, AK= Amikacin, CF= Cefalotin, CRO= Ceftriaxone, TPZ= Piperacillin-tazobactam, CIP= Ciprofloxacine, SXT= Co-trimoxazole, IMP= Imipenem, FOF= Fosfomycin, NIT= Nitrofurantoin