

Evaluation and Article Quantification of Resistant Gene in Antibiotic Resistant ESBL Producing E. coli in UTI Samples with Diabetes Mellitus: A Molecular Study

Authors	Anis Ahmad Chaudhary
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Abstract: In diabetic patients, urinary tract infections (UTIs) are more common and severe often caused by antibiotic resistance and carry worse consequences, due to high blood sugar level and frequent urination. High blood sugar provides favorable environment for the growth of pathogens and some other impairment in immune system, poor metabolic control and incomplete emptying bladder to enhance the risk of UTIs in the diabetic patients. Most of the UTIs are caused by multidrug resistant, Extended Spectrum β lactamase (ESBL) producing bacteria mostly, Escherichiacoli (E. coli). The prevalence of UTIs caused by ESBL producing Multidrug Resistant (MDR) bacteria is a major global public health concern. The aim of this study was to identify the pattern of multidrug resistance and quantification of resistance genes amongst the E. coli isolates which were obtained from UTI patients with diabetes. ESBL producing stains were found 36% by using amoxicillin/clavulanic acid as a β lactamase inhibitor. Out of these stains, following antibiotics resistance rates were achieved with ampicillin, amoxicillin, amikacin, cefotaxime, ceftazidime, chloramphenicol, ciprofloxacin, gentamicin, nitrofurantoin, norfloxacin, tetracycline and amoxicillin/clavulanic acid as 100%, and 0%, respectively. The ESBL encoding genes were characterized for CTX-M, TEM and SHV genes. CTX-M gene was found to have resistance in the E. coli isolates, some others genes as TEM and SHV respectively. These characterized genes were analyzed through PCR which is a rapid, sensitive and easy to interpret detection method. Among these isolates, CTX-M was significantly higher 85.4% in the ESBL positive strains ($p < 0.05$). TEM and SHV were found 12.8% and 6.5%, respectively. Early and proper diagnosis is necessary for the management of UTIs in diabetic patients in order to have an adequate treatment.