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MOLECULAR INVESTIGATION OF GRAM NEGATIVE BACTERIA EXTENDED SPECTRUM β-LACTAMASE IN HAEMODIALYSIS PATIENTS IN BASRAH PROVINCE, IRAQ

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Abstract

The right medication can decreases of fee that take a lot of money when the rapid screening techniques for detection of extended spectrum β-lactamase (ESBL) producing by bacteria. In the current study, we used the genotypic methods for detection the prevalence of four genes (bla_{TEM}, bla_{SHV}, bla_{CTX-M} and bla_{OXA}) in Gram-negative bacteria in haemodialysis patients that may be causing increases spend to treat of infection by bacteria that can produce ESBLs enzymes that lead to in many cases patient dead. A total of 27 clinical isolates of Gram negative bacteria that collected from haemodialysis (blood samples, were screened for the prevalence of ESBL genes by used four specific primers to amplification bla_{TEM}, bla_{SHV}, bla_{CTX-M} and bla_{OXA} genes. Results showed that 24 (88.9%) out of 27 Gram negative bacteria were ESBL positive. The highest rate of bla_{OXA} gene was 17 (70.8%) while bla_{TEM}, bla_{SHV} were 13 (54.2%) and bla_{CTX-M} was the lowest (8.3%) out of 24 ESBL positive isolates.

Key words*:* ESBLs, bla_{TEM}, bla_{SHV}, $bla_{CTX-M,}$ bla_{OXA}, Haemodialysis.

Introduction

Extended-spectrum β-lactamases (ESBLs) are classically defined as β-lactamases enzymes with the ability to hydrolyze extended-spectrum cephalosporins (ESCs), such as ceftriaxone (CRO), ceftazidime (CAZ), cefotaxime (CTX) and the aztreonam (ATM) (Livermore and Brown, 2001, Rupp and Paul, 2003, Lal *et al*., 2007, Peirano and Pitout, 2010). ESBLs are found in the Gram-negative bacteria and are plasmid-mediated enzymes, in addition, they have been derived from mutations that occurred to the original β-lactamases (Pfaller and Segreti, 2006, Kiiru *et al*., 2012). ESBLs can be blocked *in vitro* by β-lactamase inhibitors such as clavulanic acid and usually retain sensitivity to the cephamycins (*i.e*., cefoxetan and cefoxitin) or carbapenems (*i.e*., erthopenem, meropenem and imipenem) (Nathisuwan *et al*., 2001, Tham, 2012), that produced by the Gram negative bacteria and it have been identified among members of the family Enterobacteriaceae and Pseudomonadaceae in different sites but more frequently in Escherichia coli and *Klebsiella pneumonia* (Rupp and Paul, 2003, Lal *et al*., 2007, Peirano and Pitout, 2010). Major source of morbidity and mortality among hemodialysis (HD) patients the Infectious complications of the vascular access area. Abundant reports implicate the vascular access in up to 48-73% of all HD bacteriemia patients (Nassar and Ayus, 2001, Allon, 2004). Controversy remains regarding the optimal treatment and few clinical reports comparing the treatment efficacy of antibiotic in HD patients (Pitout and Laupland, 2008). Because not found real studies in Iraq that tackle the causes that lead of increased of morbidity and mortality among hemodialysis (HD) patients in Basrah province hospitals, in south of Iraq this study suggestion the screening techniques for detection of four genes (bla_{TEM}, bla_{SHV}, bla_{CTX-M} and bla_{OXA}) producing by Gram-negative bacteria in haemodialysis patients that may be causes increases spend to treated of infection by bacteria that can producing ESBLs enzymes that lead to in many cases patient dead.

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