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Detection ESBL enzymes in gram-negative bacteria

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ABSTRACT

The prevalence of Extended-spectrum ß-lactamase (ESBLs) enzymes are considered a large problem all over the world. The misuse of broad-spectrum-antibiotics especially in immunocoprmized and hospitalized patients has lead to emergence of antibiotic-resistant strains of Enterobacteriaceae and several Gram-negative bacteria (GNB), for that reason, there's an urgent need to investigate these enzymes by a continuously examination and blood culture of these patients. Blood samples n=147 were collected from Hemodialysis patients that treatment in Basrah General Teaching Hospital and Al-Sader Hospital in Basrah governorate south of Iraq, conventional microbiological methods (Biochemical tests) and also molecular methods by implified 16s rDNA and genetic sequence analysis, were used to dignosis the common types of Gram-negative bacteria and two methods were used, double disc synergy test (DDST) and double disc approximation method (DAM) to detect the present of ESBLs-enzymes in these samples. Twenty seven of Gram-negative bacteria were obtained out of 147 blood samples, and out of 27 GNB, 16(59.3 %) was positive produced ESBLs-enzymes. Cefotaxime (CTX), was found to be the more sensitive to detect the ESBLs-enzymes.

Keywords: *ESBLs-enzymes, DDST, DAM.*

1. INTRODUCTION

Antibiotics are one of the most critical discoveries which have affected human and animal health in the records of mankind. β-lactam antibiotics can be divided into six unique groups, penicillins, cephalosporins, monobactams, cephamycins, carbapenems, and β-lactamase inhibitors[1]. The β-lactamases are the collective name of enzymes that hydrolyze the β-lactam ring (addition H2O molecule to the common ß-lactam bond) of penicillins, cephalosporins, and diverse β-lactam antibiotics[2]. And due to the hydrolyzing process by β-lactamases, the β-lactam antibiotic undergoing change in their structure. This inactivates the drug, giving it a slightly extraordinary structure.