Summary

Many authors discovered treatment failure during management of many serious infections caused by Gram negative bacilli by intake of third generation cephalosporins, in spite of the standardized anti-moicrobial susceptibility work-up done before decision making ***(Ann et al., 2004)***.

The aim of this study was to detect and characterize several phenotypes of inducible β-lactamase production using Kirby-Bauer Disk Approximation (KBDD) methods. The interpretation of antibiotic susceptibility was based on a combination of inhibitory zone size and zone morphologies near a potent agent of β-lactamase induction.

In the present study, 50 different clinical samples were included, such as lower respiratory infections (sputum and bronchoalveolar lavage), urine, wound infections, blood, and cerebrospinal fluid, in which there was gram negative bacilli isolated with proven susceptibility to 3rd generation cephalosporins by standardized Kirby-Baur disk diffusion test and MIC determination by broth dilution. All isolates were further tested for inducible β-lactamases by disc approximation technique.

Of the 50 studied cases, 35 cases (70%) showed expression of inducible β-lactamases as detected by the disk approximation test morphology (either C or D type deformity). The distribution of inducible β-lactamase producing isolates among different clinical samples was as follow:

11 of 16 urine isolates (69%), 8 of 10 lower respiratory isolates (80%), 4 of 9 wound and burn isolates (45%), 11 of 14 blood culture isolates (79%).
further analysis of the distribution of inducible β-lactamase phenotype among different types of species was studied, as well as the significance of this distribution. The most frequent producers of this type of resistance were *Morganella* (100 %), *Providencia*, (100 %), *Proteus* (100 %), *Serratia* (83 %), *Enterobacter* (77 %), *Citrobacter (*75 %*), and Pseudomonas aeruginosa* (75 %*),* and the least producers of this type were *Klebsiella and E. coli*, (only 20% for each of them).

It can be concluded from this study that the use of a modified KBDD method would provide simple, visual information about bacterial resistance phenotypes, especially those latent types such as AmpC which are dependant on an inducing drug to be evident. Further characterization of KBDA zone morphologies, considered jointly with zone size measurement, can be used to detect phenomena that even a refined quantitative system would be unable to measure.

It is highly recommended to develop laboratory tools, standardized protocols and establishment of guidelines to provide accurate detection and reporting practices that will enable more effective treatment strategies for these difficult infections. It's recommended also to make other researches studying the molecular basis of this phenotype of resistance, especially those transferable forms that can widen the spectrum of spread of inducible β-lactamase among Enterobacteriaceae.