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Detection of *Acinetobacter baumannii* resistant to Minocycline, Colistin and Tygocyclin from clinical samples of hospitals

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Objectives: The increasing rate of antimicrobial resistance among *A. baumannii* species is a serious concern in treatment worldwide. Carbapeneme-hydrolyzing class D β-lactamases (CHDLs) encoded by OXA genes and some genetic elements like the insertion sequences (ISs) have an important role in resistance. The purpose of this study was to determine the antimicrobial susceptibility patterns and identify the OXA-carbapenemases genes and their related ISs that have an important role in drug resistance.

Materials & Methods: In this experimental study, a total of 105 clinical isolates of *A. baumannii* were tested for their susceptibility to different antibiotics by using disc diffusion method as recommended by the CLSI (2014).

Results: The susceptibility tests showed the high rate of resistance to all classes of antibiotics. Trimethoprim/sulfamethoxazole with rate 92.38% and minocycline and amikacin with 93.33% had a lower resistance to the others.

Conclusions: In this current study, the presence of the ISs elements in clinical isolates can explain one of the major reasons for rapid transferring of resistance genes and the high prevalence rate of OXA genes. *A. baumannii* showed the necessity of controlling nosocomial infections and separating the patients with this infection especially from children and cancer patients.

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A novel approach to antibiotics and antifungals: Testing the effectiveness of *Azadirachta indica* extracts

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Azadirachta indica (neem) extracts have proven themselves to be a promising tool because they are natural and do not cause the harmful side effects of most artificial substances. Preliminary research has shown that certain natural substances can be used without the fear of a new resistant strain developing. Current treatments are plagued by artificial substances that can have harmful side effects to the body and may not be effective for multiple uses. Thus, this project aims to determine the effectiveness of natural substances as antibacterial and antifungal. Early research suggested that the neem oil would be the most effective extract because it would envelop the bacteria and fungi. Cultures of bacteria, specifically *Staphylococcus epidermidis* and *Serratia marcescens* and cultures of fungi, specifically *Aspergillus niger* and *Saccharomyces cerevisiae*, were cultured and placed in separate plates. Zones of inhibitions were created using neem leaf extract, neem soap, neem oil, a water control and antibacterial soap control disks. The diameters of the zones where growth has stopped were compared using statistical significance tests to see if any of the natural extracts were more effective than the controls. The zones that were significantly different from the controls' zones were compared amongst each other to see if one extract was more effective than the others. This analysis has shown that the natural substances are extremely effective and significantly stronger than antibiotic and antifungal substances and the artificial substances in the soap. The remainder of the plate was then considered to be the pool of potential resistant strands. Thus repetitions were completed with each of the treatments. Since the growth was still inhibited without resistance, it became apparent that the neem extracts could have many practical purposes in treatments of infections. Given that only a few trials were completed, the experiment would have to be completed with more trials to prove the consistent effectiveness.

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