IN VITRO ANTIBACTERIAL PROPERTY OF NOVEL SYNTHETIC COMPOUNDS AGAINST MULTI-DRUG RESISTANT NOSOCOMIAL BACTERIA

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The wide implementation of antibiotics in the treatment of infectious diseases and as additives in animal feed had contributed to the emergence of multi-drug resistant bacterial strains of medical importance. These nosocomial pathogens will affect the efficiency of clinical treatment of infectious diseases in patients. Therefore it is highly essential to develop and study the antibacterial properties of novel synthetic antimicrobial compounds such as the short polymer of amino acids known as peptides and synthetic Schiff base compounds to complement the existing selection of antibiotics implemented in clinical treatment. The in vitro antibacterial activity of novel synthetic peptides and synthetic Schiff base metal complexes towards selected clinical isolates of antibiotic-resistant Methicillin-resistant Staphylococcus aureus (MRSA), Acinetobacter baumannii (AC), Klebsiella pneumoniae (AC) and Pseudomonas aeruginosa (PA) was examined in this study. Evaluation of the antibacterial property of the synthetic compounds was determined using the disc diffusion, broth micro dilution and bacterial inactivation assays. Among the 29 Schiff base metal complexes tested in disc diffusion assay, the synthetic chemical LMA Cd-N₂ was shown to more potent as it inhibited the growth of six randomly selected bacterial isolates (KB88, KB198, MRSA080425, MRSA08071, AC06127, AC08121), resulting in zones of inhibition of > 20 mm diameter. However, no inhibition zones were observed for isolates of P. aeruginosa tested against the synthetic chemicals in disc diffusion assay. Interestingly, the cationic peptides tested in this study also demonstrated weak antibacterial activity against P. aeruginosa. The results obtained from the assays showed that both compounds of synthetic chemicals and cationic peptides exhibited antibacterial activity against Gram positive and Gram negative bacteria of clinical isolates tested in the study. The study on the antibacterial potency of the novel synthetic peptides and chemicals would contribute to the crisis faced in the rapid emergence of multi-drug resistant nosocomial pathogens in medical sector.