ABSTRACT

Chronic osteomyelitis is the non-healing infection of bone leading to necrotic damage in bone tissues. Chronic bone infections can also occur in fractures, prostheses placed inside bone cavities and surgical wounds which may become chronic bone wound infections. These infections are caused by various opportunistic and antibiotic resistant pathogens. Excessive use of antibiotics poses serious health problems to humans and can also lead to development of resistance in bacteria. Infections caused by antimicrobial resistance pathogens inflict a financial and health burden to society. In the current study the bacterial isolates were collected from chronic bone wounds, later cultured and identified. Highest frequency of *Staphylococcus aureus* was observed among all bacterial strains isolated from chronic bone wounds. Nanomaterials can be used antimicrobials to help prevent the problems of antibiotic resistance. For this reason silver doped zinc oxide nanoparticles (Ag-ZnO NPs) had been prepared chemically and after estimating their physical and chemical properties, these particles were applied to the antibiotic resistant bacterial isolates. Their antibacterial efficacy was checked using disc diffusion method. It was found out that doping of silver enhanced the antibacterial efficacy of ZnO NPs by comparing the growth inhibition caused by Ag-ZnO NPs with the inhibitory zones formed by ZnO NPs. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of Ag-ZnO NPs against bacterial isolates were also measured. This confirms that Ag-ZnO NPs can be used as good therapy to cure chronic bone infections. The Ag-ZnO NPs also manifested higher anti-oxidant activity in contrast to ZnO NPs when measured through DPPH Antioxidant Assay.