Abstract

Antibiotic-resistant bacteria is a problem around the world. Silver nanoparticles (AgNPs) seem to be a potential candidate for development of new antimicrobial agents. In this study disc diffusion methods and PCR were used for phenotypic and molecular characterization of extended spectrum β-lactamase and carbapenemases producing E.coli and Klebsiella pneumonia clinical isolates. Antibacterial activity of chemically and green synthesized AgNPs were measured using micro broth dilution method, and genotoxicity of AgNPs was evaluated using Comet Assay. Molecular characterization revealed the dominance of CTX-M-15 and NDM-1 resistance genes. Both types of silver nanoparticles show a bactericidal effect against all isolates. The efficiency of green synthesized AgNPs was significantly better than chemically synthesized particles while bacterial DNA damage produced by chemically synthesized AgNPs was greater than green synthesized AgNPs. These results suggest the superiority of green synthesized AgNPs as a safer antibiotic alternative.