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The antibacterial effect of green and chemically synthesized silver nanoparticles on Extended spectrum β-lactamase (ESBL) and carbapenemases producing Enterobacteriaceae (CPE)

An antibiotic-resistant bacterium 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 pneumoniae* 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.

Biography

May M Alrashed has completed his/her PhD in Molecular Genetics. She is serving as Vice Dean for the College of Applied Medical Sciences, King Saud University and Assistant Professor at the Department of Clinical Laboratory Sciences. She is the Cofounder of Zahra Breast Cancer Association. Her research interests include molecular characterization of different diseases, mutation identification, whole exome sequencing, next generation sequencing and nano technology.

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