

## ABSTRACT

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia (high blood sugar levels). Every year, 1.5 million people die, according to the World Health Organization. Because of their limited bioavailability and unpredictable release, many standard medicines are ineffective against diabetes mellitus. Nanotechnology is one of the most current technologies that are paving the way for a more reliable means of diagnosing and treating diabetes mellitus. Biosynthesis of nanoparticles using nanotechnology is a generally established biomimetic approach for producing biocompatible and biodegradable nanoparticles which are less harmful for the body as well. *Azadirachta indica* (Neem) is a medicinal plant that is employed in the biosynthesis of ZnO nanoparticles using zinc acetate dihydrate and sodium hydroxide. The formation of the synthesized ZnO nanoparticles was confirmed by SEM (Scanning Electron Microscope) analysis, Fourier transform infrared spectroscopy (FT-IR), UV-vis spectroscopy, EDX (Energy Dispersive X-ray) analysis and photoluminescence (PL) studies are used to analyze them. When ZnO nanoparticles were administered to alloxan-induced diabetic albino mice in various doses, they demonstrated anti-diabetic efficacy. The trial was of two weeks after the formation of silver nanoparticles. Five groups of albino mice were subjected under trial. 1<sup>st</sup> group (G1) was -ve control group which was non-diabetic, 2<sup>nd</sup> group (G2) was +ve control group which was untreated diabetic group. 3<sup>rd</sup> group (G3) was treated group with low dose (3mg/kg) of ZnO NPs, 4<sup>th</sup> group(G4) was treated with moderate dose(7mg/kg) of ZnO NPs and 5<sup>th</sup> group (G5) was treated with high dose(14mg/kg) of ZnO NPs. There was a significant decrease in blood glucose in treated groups of diabetic mice, and moderate dose(7mg/kg) was the optimized dose showed the maximum effect. The RFTs and LFTs also done which showed a decrease in serum urea and creatinine level in treated groups with ZnO NPs in diabetic mice. Histological studies also performed.

