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Acetaminophen induced hepatotoxicity: Preventive effect of gold nanoparticles

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Statement of the problem: Gold nanoparticles (AuNPs) exhibit amazing physical, chemical and biological properties and have been widely used in medical applications like bio-imaging, drug delivery and photonics. The present study was aimed to evaluate the therapeutic effect of AuNPs to protect the hepatotoxicity induced by Acetaminophen (APAP).

Methodology & Theoretical Orientation: Female Albino rats of *Wistar* strain were administered with APAP at a dose of 20 mg/kg p.o (5 days/week for 4 weeks). Animals were treated with AuNPs at a dose of 100 µg/kg p.o. and silymarin at a dose of 50 mg/kg p.o. for 2 days/week for 4 weeks.

Findings: APAP induced significant rise in hepatospecific markers which indicated the hepatocellular damage. APAP administration exhibited substantial oxidative stress, regulation of proinflammatory cytokines and cellular DNA damage. Biochemical analysis of antioxidant enzymes revealed significantly declined activities due to increased oxidative stress in APAP exposed rats. Treatment with AuNPs significantly ameliorated the APAP induced liver injury, oxidative stress and DNA damage, which can adversely affect the normal cellular functioning in rats. Our biochemical investigations were also supported by histological studies. The efficacy of AuNPs were comparable to the standard drug silymarin, data indicated a positive effect.

Conclusion & Significance: It is concluded that AuNPs showed remarkable amelioration against APAP induced toxicity. Thus it is concluded that AuNPs can be used for the development of hepatoprotective drug after further preclinical and clinical studies, which may raise a hope for the patients with hepatic disorders.

Biography

Mohd Salim Reshi completed his PhD from School of Studies in Zoology, Jiwaji University, Gwalior. He was awarded with JRF and SRF from UGC, New Delhi, India. He has been awarded MP Young Scientist award and many other awards in several conferences and symposia. He is working on nanoparticles in hepatoprotection and cancer prevention. His areas of research interest are Pharmacology, Toxicology, Hepatoprotection, Nanomedicine and Cancer Prevention.

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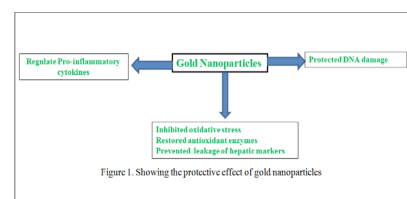


Figure (1): Showing the protective effect of gold nanoparticles against APAP toxicity

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