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Silver nanoparticles as a therapeutic agent in experimental cyclosporiasis

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Cyclosporiasis is an emerging worldwide infection caused by an obligate intracellular protozoan parasite, *Cyclospora caytenensis*. The standard treatment for cyclosporiasis is a combination of two antibiotics, trimethoprim and sulfamethoxazole. Many side effects were reported with this combination with no alternative drug treatment option. In this study, silver nanoparticles were chemically synthesized to be evaluated for the first time for their anti-cyclospora effects in both immunocompetent and immunosuppressed experimental mice in comparison to the standard treatment. The effect of silver nanoparticles was assessed through studying stool oocysts' load, oocysts' viability, ultrastructural oocysts' changes, and estimation of serum gamma interferon. Toxic effect of the drug was evaluated by measuring liver enzymes, urea and creatinine in mice sera. Results showed that silver nanoparticles had promising anti-cyclospora potentials. The animals that received these nanoparticles showed statistically significant decrease in the oocysts' burden and number of viable oocysts in the mice stool and a statistically significant increase in serum gamma interferon in comparison to the corresponding group receiving the standard treatment and to the infected non-treated control group. Scanning Electron microscopic examination revealed mutilated oocysts with irregularities, poring and perforations. These effects were more pronounced in immunosuppressed animals. Biochemical results showed no evidence of toxicity as mice sera showed a statistically significant decrease in liver enzymes, and statistically non-significant decrease in urea and creatinine. Thus, silver nanoparticles proved their effectiveness against *Cyclospora* infection and this will open the way to its use as an alternative to the standard therapy.

Biography

Mona El-Temsahy is currently working in the Medical Parasitology Department, Faculty of Medicine, Alexandria University, Egypt. She is an expert in different diagnostic techniques in parasitological diseases and also in application of new lines of treatment such as nanoparticles.

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