Immunomodulatory effect of gelatin-coated silver nanoparticles in mice: Ultrastructural evaluation

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Abstract:

Silver nanoparticles (SNP) are used in many pharmaceutical, cosmetic, and industrial products already available in the market. Although they are considered relatively safe, many toxic and pathological alterations in different organs including immune organs were reported after SNP administration. In this study, 10-week-old male mice (n = 20) were divided into two groups. Ten mice received greenly synthesized gelatin-coated silver nanoparticles in a dose of 10 mg/kg body weight for five consecutive days while the other 10 received 0.5 ml of distilled water daily for 5 days and kept as control. At the sixth day, all mice were sacrificed; blood and tissue samples were collected and prepared for pathological analysis. Liver and kidney lesions were in the form of degenerative and inflammatory changes. Interestingly, the immune organs were drastically affected by SNP treatment. Severe hyperplasia of the Peyer's patches was noticed in the intestines of intoxicated animals both in gross and microscopic examination. Spleen was enlarged and showed large number of megakaryocytes. The particles were encountered in membrane-bound phagosomes inside macrophages in different organs like lungs and spleen. Blood picture complied to morphological findings with an increase in monocytes and eosinophils accompanied by drop in the platelets count in the intoxicated animals.

Keywords:

Immune modulation; megakaryocytes; Peyer's patches; silver nanoparticles

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