

Histological and ultrastructural studies on liver and lung changes of male mice induced by a new car fuel (benzene 91) in Saudi Arabia and the protection effect of Alajwah dates .

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Abstract

This study was conducted to assess the induced changes in the liver and lungs of albino mice by vehicles fuel (Gasoline 91) which is used in Kingdom of Saudi Arabia since 2007 as a step to improve the gasoline quality in the Kingdom. Soaked date was used to study its protective role in eliminating the poisonous cellular and histological effects of this compound. Experiments were carried out on 65 "Balb/C" adult male mice. The study sample was divided into five groups; 15 mice each. 1st Control Group(G₁)represented the animals which administrated by regular drinking water. 2nd Control Group (G₂)represented the animals given gastric intubation dose of 0.02 mg/kg/ 5 days/ week of soaked dates. (G₃)represented the animals exposed to benzene 91 at dose of (0.008mg/kg) in the exposure box for eight hours a day/ 5 days/week. (G₄) represented the animals given soaked dates, then exposed to gasoline 91 at dose of (0.008mg/kg) in the exposure box for eight hours a day/ 5 days/week. Animals of G₁,G₂,G₃,and G₄ were dissected after the end of each experimental period,8,16, and 24 weeks. Group(G₅)represented the animals exposed to benzene 91 at dose of(0.008mg/kg) in the exposure box for eight hours a day/ 5 days/week for 8 weeks and left to recover for 8 weeks. The most important results concluded by the study in the liver of (G₃)congestion of portal and central veins ,dilating the blood sinusoids and fatty infiltration in hepatocytes .However, after 16 weeks, necrosis, vacuolation were noticed and significant hypertrophy in the cells nuclei. hypertrophy of mitochondria and fragmentation the rough ER, proliferation of smooth ER with increase of lysosomes, and deformed nuclei. After 24 weeks, a sever cytoplasmic degeneration, necrosis and cellular inflammatory. Examination of (G₄) showed an increase of the cellular activity and emergence of binucleated cells. The examination revealed the continuity of most tissue damages in (G₅), increase of mitochondria numbers, dilation of rough ER cisternae, and hypertrophy and deformation of Golgi were observed. The lung examination of (G₃)after 8 weeks showed a congestion of blood vessels and capillaries, endothelial necrosis, and phagocytes aggregates. After 16 weeks, the alveolar wall thickness was noticed, (P₁) and (P₂) hypertrophy, proliferation of fibroblast. The cellular examination revealed existence of macrophages in capillaries lumen , hypertrophy of (P₂) cells and disorder of lamellar bodies numbers, mitochondria deformation in the cup shaped, , cytoplasmic lysis of (P₁), necrotic nuclei with intranuclear inclusions. After 24 weeks, a local pulmonary fibrosis was observed. The (G₄) after 8 weeks showed decreased blood vessels congestion. After 16&24 weeks revealed significant reduction in tissue impairments. The (G₅) showed the blood capillaries congestion, (P₁) necrosis and organelles lysis, (P₂) hypertrophy with deformed (Lb). The previous results shown the benzene toxicity on liver and lungs tissues as well as the efficient protective role of soaked dates .