

عنوان مقاله:

Protective effects of silymarin-loaded chitosan nanoparticles in the diet-induced hyperlipidemia rat model

محل انتشار:

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نویسندگان:

Vahid Akheratdoost - Department of Veterinary Basic Sciences, Science and Research Branch, Islamic Azad University, Tehran, Iran

Negar Panahi - Department of Veterinary Basic Sciences, Science and Research Branch, Islamic Azad University, Tehran, Iran

Shahabeddin Safi - Department of Veterinary Pathobiology, Science and Research Branch, Islamic Azad University, Tehran, Iran

Faraz Mojab - Department of Pharmacognosy, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Ghasem Akbari - Department of Veterinary Clinical Sciences, Science and Research Branch, Islamic Azad University, Tehran, Iran

خلاصه مقاله:

**Objective(s):** Obesity is a metabolic syndrome that leads to many chronic diseases worldwide. In this study, we investigate the antihyperlipidemic activities of chitosan nanoparticles (CH NPs) on silymarin (SIL) as a carrier in the drug delivery system that can improve some biochemical parameters and hormones in the model of hyperlipidemic rats receiving a high-fat diet (HFD). **Materials and Methods:** Physicochemical characterization of silymarin-loaded chitosannanoparticles (CH-SIL NPs) was done by Fourier-transform infrared (FTIR) spectroscopy, dynamic light scattering (DLS), and drug loading efficiency (LE). Diet-induced hyperlipidemic rats were treated with SIL (۱۵ mg/kg/day) and CH-SIL NPs (۱۵ mg/kg/day) for twelve weeks orally daily. The body weight loss (BW), food consumption, serum total cholesterol (TC), triglycerides (TG), high-density lipoprotein (HDL), levels of fasting blood glucose (FBG) in serum, serum insulin, cortisol, testosterone, and brain neuropeptide Y (NPY), Y<sub>1</sub> and Y<sub>5</sub> receptor mRNA expression were analyzed. **Results:** A significant reduction in BW and food consumption from  $417 \pm 16$  g and  $33 \pm 1.3$  in group HFD to  $338 \pm 10$  g and  $17.33 \pm 1.02$  in group CHS+HFD was observed, respectively. This data revealed that CH-SIL NPs improved hyperlipidemia, hyperinsulinemia, and hyperglycemia, reduced serum cortisol, and down-regulated NPY and Y<sub>1</sub>R with a significant increase in HDL and testosterone hormones compared to the control group. **Conclusion:** The developed Sil-loaded CH NPs were good agents for improving efficacy. It is the first report of the proposed weight loss mechanism of SIL CH NPs, thereby providing information about the anti-hyperlipidemic and antihyperglycemic effects of silymarin-loaded chitosan nanoparticles, a natural food with proper effects against metabolic disorders in case of hyperlipidemia that may lead to obesity and up-regulation of brain NPY.

کلمات کلیدی:

Antiobesity, Body mass index, Chitosan, Dyslipidemia, High cholesterol diet, HOMA-IR, Silymarin

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