

Water-soluble C₆₀ fullerene nanoparticles attenuate liver failure features in rats with experimental obstructive jaundice

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Mechanic obstructive jaundice is the severe pathology with poor prognosis, which causes significant liver morpho-functional changes, manifested by hepatocytes dystrophy, endotoxication rise and impaired liver functions. The effective preoperative pharmacological treatment of liver failure is virtually absent, so development of medication for its correction is on paramount of importance.

The effects of water-soluble biocompatible C₆₀ fullerenes (C₆₀FAS) [1] on liver function under rat liver failure model induced by experimental obstructive jaundice were aimed to be discovered. The bile ducts were obstructed by common bile duct ligation. C₆₀FAS (0.5 mg/kg) was administered per os or intraperitoneally (i.p.) on 24th and 48th h after bile ducts obstruction, and on 72nd h animals were sacrificed. Serum aminotransferases (ALT, AST), alkaline phosphatase (AP), lactate dehydrogenase (LDH) and serum total and direct bilirubin were measured.

Increase of total and direct bilirubin (up to 3 times), ALT and AST (up to 2 times), AP (up to 1.5 times) and LDH (up to 4 times) in rats with obstructed bile ducts were observed, suggesting the jaundice, cholestasis and hepatocyte cytolysis. C₆₀FAS when administered by both ways normalized the direct bilirubin and ALT. Additionally total bilirubin and AP were normalized under C₆₀FAS i.p. injection, indicating the attenuation of obstructive jaundice symptom severity, which could be realized through C₆₀ fullerenes antioxidant properties [2]. However, AST remained unchanged and LDH even increased, pointing cholestasis persistence.

Thus, the partial correction of obstructive jaundice-induced liver failure caused by C₆₀FAS was demonstrated, and C₆₀FAS i.p. injection much efficacy was concluded.

1. Ritter U., Prylutskyi Yu., Evstigneev M., et.al. Structural features of highly stable reproducible C₆₀ fullerene aqueous colloid solution probed by various techniques // Fullerenes, Nanotubes, Carbon Nanostruct.-2015.-**23**, N 6.-P.530-534.
2. Halenova T., Vareniuk I., Roslova N., et.al. Hepatoprotective effect of orally applied water-soluble pristine C₆₀ fullerene against CCl₄-induced acute liver injury in rats //RSC Adv.-2016.-**6**, N 102.-P.100046-100055.