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Hepatoprotective Effect of Fetal Tissue Cytosol and Its Thermostable Fraction in Rats with Carbon Tetrachloride-Induced Hepatitis

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Pretreatment of rats with cytosol of fetal tissue or its thermostable fraction prevented death of animals from CCl_4 intoxication, decreased serum transaminase activities and level of TBA-reactive products, and normalized the prooxidant/antioxidant balance in the liver. The effect of cytosol was more pronounced than that of its thermostable fraction.

Key Words: CCl_4*-induced hepatitis; liver injury; prooxidant/antioxidant balance; fetal tissue cytosol*

The corrective potential of transplanted stem and progenitor cells can be determined by not only their organ-replacing function, but also by production of bioactive stage-specific compounds regulating metabolic processes, specifically, stimulating regeneration and repair of damaged tissues.

We previously showed that pretreatment of animals with human fetal liver cells or with fetal tissue cytosol (FTC) stimulated liver regeneration after 70% hepatectomy and reduced the severity of CCl_4-induced damage by correction of the prooxidant/antioxidant balance in the organ [3,4]. Cell-free FTC exhibited an effect similar to that of cell transplantation, but short-term and less pronounced, which could be due to degradation of its components. Shortening of the period between its injection and initiation of toxic hepatitis to 4 h prolonged the hepatoprotective effect of pretreatment [4].

In order to detect bioactive fetus-specific factors in FTC responsible for realization of the protective and metabolic effects we selected the method of its thermal denaturing [7], due to which the effect of a wide spectrum of thermolabile proteins could be ruled out. In addition, this method is used for partial purification of the thermostable hepatocyte growth factor, stimulating liver regeneration [1] and present in fetal tissues [6].

We compared the effects of total FTC and its thermostable fraction (TSF) on the dynamics of CCl_4-induced hepatitis and prooxidant/antioxidant balance in damaged organ.

MATERIALS AND METHODS

Experiments were carried out on 28 random-bred male albino rats (150-200 g) kept under standard vivarium conditions. Experiments on animals were carried out in accordance with the regulations of "The European Convention for Protection of Vertebrates Used in Experimental and Other Research Purposes". All manipulations were carried out under light ether narcosis.

Human embryos of 9-12-week gestation were obtained as a result of medical abortions after written consent of donors. FTC was isolated by high-speed staged ultracentrifugation (protein content 1.0±0.2 mg/ml) [5]. TSF was obtained as described

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