Abstract

Acute liver failure (ALF) is life-threatening disease with high mortality rate. Orthotopic liver transplantation is the only effective therapy but it is limited with scarcity of donor organs. Other methods are searching for as bridging therapy. Transplantation of hepatocytes seems to be a promising method. We have chosen the chemical model of acute liver failure caused by intraperitoneal (i.p.) application of thioacetamide (TAA) in rats. We wanted to investigate the course of ALF when induced by increasing doses of TAA, ranging from 175 to 700 mg/kg of body weight i.p. per day. Plasma levels of albumin, bilirubin, alanine aminotransferase and aspartate aminotransferase activities and ammonia levels and survival rate were determined. We also examined whether Wistar and Lewis rats exhibit any differences in the course of ALF in response to increasing TAA doses. Our data show that Wistar rats are more susceptible to developing TAA-induced ALF than Lewis rats. In the other part we focused on hepatocyte transplantation in ALF. TAA was administrated i.p. in two injections, in the total amount of 525 mg/kg of body weight. After this dose all Lewis rats developed ALF and without treatment succumbed within first 48 h. Hepatocyte were isolated from transgenic male rat luc-Lwe-Tg in two step collagenase perfusion. Isolated hepatocytes in the amount of 2×10^6 cells dissolved in 600 µl of physiological saline solution were implanted into the liver via the portal vein. For imaging of transplanted hepatocytes we used non-invasive bioluminescent imaging system. The results show that hepatocyte transplantation can attenuate the course of TAA-induced ALF in Lewis rats. It was reflected by improved survival rate and reduced degree of liver injury.

Key words: acute liver failure-hepatocyte transplantation-thioacetamide