

عنوان مقاله:

Ameliorating effect of encapsulated hepatocyte-like cells derived from umbilical cord in high mannuronic alginate scaffolds on acute liver failure in rats

محل انتشار:

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خلاصه مقاله:

Objective(s): In this study, effects of encapsulated umbilical cord stem cells (UCSCs)-derived hepatocyte-like cells (HLCs) in high mannuronic alginate scaffolds was investigated on CCl₄-induced acute liver failure (ALF) in rats. **Material and Methods:** UCSCs were encapsulated in high mannuronic alginate scaffolds. Then the UCSCs differentiated into HLCs for treatment of CCl₄-induced ALF in rats. Thirty rats randomly divided into 5 groups: Intoxicated group received only CCl₄ to induce ALF. In other groups including cell-free, UCSCs and HLCs, alginate scaffolds were transplanted into the liver 7 days after CCl₄ injection. Biochemical markers including albumin (ALB), blood urea nitrogen (BUN), alanine aminotransferase (ALT), aspartate aminotransferase (AST), and alkaline phosphatase (ALP) were evaluated. Histological changes and gene expression of ALB, alpha-fetoprotein (AFP), and cytokeratin 18 (CK-18) were also assessed. **Results:** Expression of CK-18 significantly increased in HLCs compared to the UCSCs in vitro. This indicates that UCSCs can effectively differentiate into the HLCs. In CCl₄-intoxicated group, BUN, AST and ALT levels, and histological criteria, such as infiltration of inflammatory cells, accumulation of reticulocytes, nuclear pyknosis of hepatocyte and sinusoidal dilation, significantly increased. In this group, ALB secretion significantly decreased, while AFP expression significantly increased. Both UCSCs and HLCs encapsulated in alginate scaffolds effectively attenuated biochemical tests, improved liver cytoarchitecture, increased expression of ALB and reduced AFP expression. **Conclusion:** Finding of the present study indicated that encapsulation of UCSCs or HLCs in alginate mannuronic scaffolds effectively improve CCl₄-induced ALF.

کلمات کلیدی:

Acetylsalicylic acid, Antioxidants, Epididymis, Melatonin, Sperm, Testosterone

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