

## Comparative Stem Cells Therapy for Regeneration of Liver Fibrosis

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**Abstract :** Background: Human umbilical cord blood (HUCB) is considered as a unique source for stem cells. HUCB contain different types of progenitor cells which could differentiate into hepatocytes. Aims: To investigate the potential of rat's liver damage repair using human umbilical cord mesenchymal stem cells (hUCMSCs). We investigated the feasibility for hUCMSCs in recovery from liver damage. Moreover, investigating fibrotic liver repair and using the CCl<sub>4</sub>-induced model for liver damage in the rat. Methods: Rats were injected with 0.5 ml/kg CCl<sub>4</sub> to induce liver damage and progressive liver fibrosis. hUCMSCs were injected into the rats through the tail vein; Stem cells were transplanted at a dose of 1×10<sup>6</sup> cells/rat after 72 hours of CCl<sub>4</sub> injection without receiving any immunosuppressant. After (6 and 8 weeks) of transplantation, blood samples were collected to assess liver functions (ALT, AST, GGT and ALB) and level of Procollagen III as a liver fibrosis marker. In addition, hepatic tissue regeneration was assessed histopathologically and immunohistochemically using antihuman monoclonal antibodies against CD34, CK19 and albumin. Results: Biochemical and histopathological analysis showed significantly increased recovery from liver damage in the transplanted group. In addition, HUCB stem cells transdifferentiated into functional hepatocytes in rats with hepatic injury which results in improving liver structure and function. Conclusion: Our findings suggest that transplantation of hUCMSCs may be a novel therapeutic approach for treating liver fibrosis. Therefore, hUCMSCs are a potential option for treatment of liver cirrhosis.

**Keywords :** carbon tetra chloride, liver fibrosis, mesenchymal stem cells, rat

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