SUPPRESSION OF TUMORIGENESIS BY BONE MARROW-DERIVED MESENCHYMAL STEM CELLS IN HEPATOCELLULAR CARCINOMA RAT MODEL

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Abstract

Introduction: Mesenchymal stem cells (MSCs), represent an attractive tool for the establishment of a successful stem-cell-based therapy of liver diseases. The present study was conducted to evaluate the tumor suppressive effects of bone marrow derived mesenchymal stem cells (BMMSCs) in an experimental hepatocellular carcinoma (HCC) murine model.

Method: Fifty rats were included in this study. They were divided into: 10 rats as control negative group, 40 rats were injected with repeated doses of diethylnitroseamine (DEN) and carbon tetrachloride (CCL4) to induce HCC, 20 were treated with intrahepatic injection of BMMSCs and the other 20 were left as untreated pathological control. Histopathological examination of rat liver sections, and serum levels of ALT, AST, catalase enzyme and alpha fetoprotein were performed in all groups.

Results: The results of the study demonstrated that treatment with MSCs showed a remarkabledelay intumor growth with prolonged survival in rat tumor models.Histopathological examination of liver tissues of rats that received DEN-CCl4 showed the presence of anaplastic cell changes and macro-regenerative nodules type II with foci of large and small cell dysplasia. Transplantation of MSCs in HCC rat model improved the histopathological picture which showed minimal liver cell damage, reversible changes, areas of cell drop out filled with stem cells. Amelioration of the liver status after administration of MSCs showed a significant decrease of ALT, AST, catalase enzyme and Alpha fetoprotein serum levels.

Conclusion: Administration of MSCs in chemically induced HCC has tumor suppressive effects on tumor and is feasible to be applied in cancer treatment as evidenced by subsequent amelioration of liver histopathological pictures and functions.

Keywords— Hepatocellular Carcinoma, Mesenchymal Stem cells, Hepatocyte Regeneration.

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