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Transplantation of hepatocyte like cells derived from human tooth into the animals with liver conditions

We treated the liver cirrhosis by transplantation of hepatocyte-like-cell derived stem cells from human exfoliated deciduous tooth (SHED) into the rat or swine with cirrhosis, NASH or biliary cirrhosis model. SHED at 3 passage was separated by magnetic sorting with CD117 antibody. For hepatic differentiation, CD117+ SHED were grown in DMEM supplemented with insulin-transferrin-selenium-x (ITS-x), embryo-tropic-factors(ETF) and hepatocyte-growth-factor (HGF) for 5days: IMDM supplemented with ITS-x, ETF, HGF, dexamethasone and oncostatin for another 11 days. F344-Nude rats were employed for this study. Carbon tetrachloride (CCl₄) was administered by intra-peritoneal injection for 12 weeks to induce cirrhosis. Hepatocyte-like-cells (2 x 10⁶ cells/ animal) suspended in Hank's Balanced Salt Solution were transplanted into the spleen. The vehicle was injected to the positive control group. Non-cirrhosis-models were used as negative control group. Animals were sacrificed 4 weeks after the transplantation. Immunocytochemistry observation of the hepatically differentiated cells strongly demonstrated positive staining for albumin, IGF-1, α-feto-protein, HNF4α and CPS-1. The histopathological analysis, HE and Masson's trichrome staining, indicated a significant decrease of fibrous tissue in the transplantation group with comparison to the positive control group. Healthy liver tissues were recovered by the transplantation. Moreover, serological test results revealed significant differences between the groups. Serum ALT levels of the test group dramatically decreased to one-third compared to the positive control group. Activities of albumin, bilirubin, BUN, HA levels were also recovered. The xenotransplantation of hepatocyte-like cells from human tooth transplanted into the liver with severe failure, demonstrated their capacity to preform positively because of drastic decreasing fibrous tissues. Together, these findings suggested. Hepatocyte-like cells derived from SHED are a potential source for treating chronic liver injuries such as cirrhosis.

Biography

Yaegaki K had received Doctor of Dental Science, and then completed his Ph.D in Medicine from Kurume University in Medical Biochemistry and Post-doctoral studies from University of British Columbia. He was trained as an Oral Maxillofacial Surgeon at School of Medicine Kurume University. His speciality was facial injuries. He is the Director and Head of Oral Health at Nippon Dental University, which is the oldest dental school in Asia, also a Dean of Ph.D Program. He has published more than 100 papers and 20 books.

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