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Ken Yaegaki, J Tissue Sci Eng 2016, 7:3(Suppl)
http://dx.doi.org/10.4172/2157-7552.C1.029

Global Congress on

Tissue Engineering, Regenerative & Precision Medicine

December 1-2, 2016 | San Antonio, USA

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Regenerated liver from human tooth pulp treats swine liver failure started by NAFLD

The number of cadaveric or live-donor liver transplantation is very limited, because of fewer available organs; the liver regeneration might be a substitution of the transplantation mention above. Hence, research endeavor has been focused on developing a protocol for regenerative medicine of the liver. Not only preclinical studies but also some clinical studies were carried out with transplanting mesenchymal stem cells, i.e., CD34 positive cells from blood, bone marrow or adipose tissue into the livers accompanied with severe condition but the transplantation protocol of hepatic differentiated cells has not yet well reported. Transplantation of these cells can only decelerated the progress of hepatic failure in animal or human. It is very difficult to treat the conditions of the liver with present protocol employing stem cell or regenerative medicine. These days, it was almost concluded that regenerative medicine is valuable only for postpone getting the final stage of severe liver conditions or for prolong the waiting time for cadaveric or live-donor liver transplantation; "bridge to transplant" strategy rather than treating liver failure. We have shown that human dental pulp stem cell demonstrated a big potential for curing lethal liver diseases. Our preclinical study has described that the biliary liver cirrhosis and acute liver injury in rats were treated with transplanting the regenerated liver tissues derived from human dental pulp. One of the worse liver conditions is non-alcoholic fatty liver disease (NAFLD) or non-alcoholic steatohepatitis (NASH). Hence the objectives of this paper is to determine a possibility of treating severe liver failures by our transplantation protocol of the regenerated liver tissues derived from human dental pulp with using swine model of liver failure progressed from NAFLD. After four weeks of transplantation into 6 swine with the failure, the secondary liver was regenerated in the spleen as well as the regenerated liver was produced: The original liver was utilized as a scaffold. Biliary ducts were also reproduced with human tissues only 4 weeks after the transplantation but partially. Serum albumin concentration was raised from 1.5 g/dL to over 3.0 g/dL. HPT, choline esterase, collagen type-IV, ALT and others have been considerably improved.

Biography

Ken Yaegaki has completed his PhD in Medicine at Kureme University School of Medicine and Postdoctoral studies from University of British Columbia. He was trained as Oral Maxillofacial Surgeon. He has worked at UBC Dentistry as a Clinical Professor and moved to Oral Health at Nippon Dental University and he is also a Dean of PhD program. He has published more than 100 papers and 20 books. He has been serving as an Editorial Board Member of repute.

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