Stem cell therapy in liver cirrhosis

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Liver cirrhosis represents the commonest end stage outcome of chronic liver disease, characterized by diffuse hepatic fibrosis and nodule formation, which essentially occurs due to abnormal innate immune responses and massive inflammatory responses. It is a multifactorial condition, ranging from toxins such as alcohol and certain drugs, to hepatocellular carcinomas. Worldwide, it accounts for up to two million deaths per year, out of which about 50% are due to complications and the rest due to viral hepatitis and carcinoma.

The current most effective modality of treatment of liver cirrhosis includes liver transplantation along with treatment of the underlying cause, complications, and nutritional support. However, issues due to scarcity of donors and various immunological complications, warrants the need for newer avenues of treatment.

One such novel modality is usage of stem cell therapy for liver cirrhosis, which works primarily via improving microenvironments through paracrine effects and replenishment of hepatocytes. Studies have found that the most clinically effective acting in this respect are the Mesenchymal Stem Cells (MSCs). MSCs are immunomodulatory, pro-regenerative and said to have antifibrotic properties. Their immunomodulatory action occurs via production of inhibitory cytokines and activating the development of regulatory T cells. Additionally, they also directly inhibit the hepatic stellate cells as well as bring about replenishment of damaged hepatocytes. This has been seen especially with embryogenic stem cells (ESCs) and induced pluripotent stem cells (iPSCs), which prove to hold the capacity of producing huge amounts of functional hepatocytes-like cells (HLCs). Due to the enhancement of the surrounding microenvironments, it is also likely to activate regeneration of residual hepatocytes.

Studies have found that some of these modalities seem promising, considering the improvement of various biochemical parameters, such as serum total bilirubin and serum albumin. It's also essential to understand that standardized protocols, long term efficiency and financial feasibility are some problems that remain to be addressed. Novel technology and continued research are expected to overcome these hurdles.

Speaker Biography

Rutuja Patil has completed her M.B.B.S. from Bharati Vidyapeeth Medical College, Pune, India. She is currently working as a medical intern. She has recently begun her research endeavors and has three ongoing research projects.

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Received Date: July 06, 2022; **Accepted Date:** July 08, 2022; **Published Date:** August 30, 2022