

**10th World Congress and Expo on Cell & Stem Cell Research \_The merits of autologous mesenchymal stem cells peripheral vein infusion in patients suffering from end stage liver cirrhosis\_ Ayman Salah \_ Cairo University, Egypt**

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Cirrhosis, the top result of prolonged liver damage, places a major burden on healthcare worldwide. There are many possible manifestations of cirrhosis. These signs and symptoms may be a direct result of liver cells failure, or secondary to the resultant increased pressure in the blood vessels in the liver portal system. Cirrhosis of the liver is slow and gradual in its development. It is usually well advanced before its symptoms are noticeable because it is a cause of alarm. Weakness and weight loss may be the initial symptoms. Cirrhosis usually precedes hepatitis and liver disease (steatosis), which is independent of the cause. If the cause is removed at this stage, the changes are completely reversible. Liver transplantation is the only definitive therapeutic option for these patients. However, a worldwide reduction of donor liver has prompted for alternative cell therapies. The potential clinical use of autologous multipotent mesenchymal stem cells (MSCs) isolated from bone marrow (BM) holds great promise for the treatment of a large number of diseases that are in the late stage liver disease. Sixty patients with hepatitis C virus (HCV) end-stage liver disease were included in this study. They were randomly classified into two groups: Group 1: 35 patients whose granulocyte colony-stimulating factor (G-CSF) was administered for 5 days to mobilize their hematopoietic stem cells. After leukapheresis, CD34 (+) stem cells were isolated, amplified, and partially differentiated into culture, then re-injected via peripheral-vein infusion. Group 2: 25 patients who received only liver-supportive treatment (control group). Hepatic fibrosis was assessed by detecting procollagen IIC peptide levels (PIIICP) and procollagen III N peptide levels (PIIINP) in group I. In group I, liver functions were markedly improved in 57.1% of patients. Albumin ( $P = 0.000$ ), significant changes in bilirubin ( $P = 0.002$ ), international normalized ratio (INR) ( $P = 0.017$ ), prothrombin concentration ( $P = 0.029$  with stabilization of clinical and biochemical status in 14.3% of cases). ) And alanine transaminase (ALT) levels ( $P = 0.029$ ). While no significant improvement was found in any of the patients in group II. Pretreatment values of s-PIIICP and s-PIIINP were 8.2 and 3.7 and 395 with 175, respectively, with a decrease of  $7.3 \pm 2.1$  and 338, 95 at 3 months after MSC therapy, respectively, however, the difference was statistically nonsignificant ( $p = 0.7$ ). A significant coefficient of correlation was reported between s-PIIINP and prothrombin concentration ( $P = -0.5$ ) and between s-PIIICP and ascites ( $P = 0.550$ ). It is often concluded that mixing G-CSF with MSCs will greatly improve the outcome of stem cell treated patients with end stage disease. In addition peripheral intravenous infusion is a simple and convenient method of delivery of stem cells, compared to the intrauterine infusion route with less-invasive

and less painful effects. Furthermore, IV infusion of MSCs after G-CSF mobilization improves S-albumin within the first 2 weeks and prothrombin concentration and alanine transaminase after 1 month. In addition, MSCs may act directly through inhibiting collagen formation, as evident by their ability to scale back liver fibrosis markers. Taken together, our data provide evidence that CD34 (+) MSCs followed G CSF mobilization, which is excellent for liver stem cell therapy to maintain liver mass and restore liver function.

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