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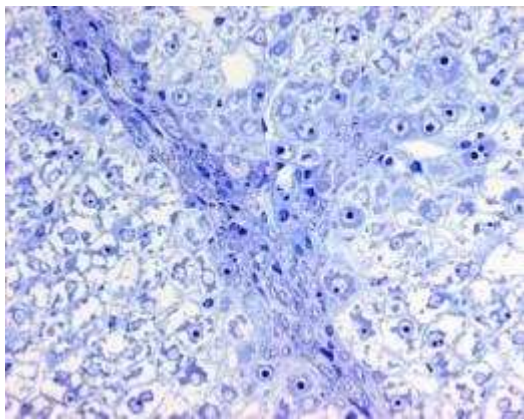
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The use of stem cells in regenerative medicine may also be detrimental for health

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This is a microscope view of the cirrhotic liver of a rat. Credit: University of Granada

The use of stem cells in regenerative medicine is not always beneficial for human health, it may even be harmful according to a work done by the University of Granada and University of León. Scientists have demonstrated that transplantation of human mononuclear cells isolated from umbilical cord blood exerted a deleterious effect in rats with liver cirrhosis.

Researchers aimed to investigate whether the mononuclear cell fraction of human cord blood (HUCBM cells), which contains stem cells, might be useful in hepatic regenerative medicine. Both histological and biochemical findings obtained in this research suggest that cell transplantation did not improve the health of sick animals but it induced a hepatorenal syndrome instead.

The authors of this work are Ana I Álvarez-Mercado, María V García-Mediavilla, Sonia Sánchez-Campos, Francisco Abadía, María J Sáez-Lara, María Cabello-Donayre, Ángel Gil, Javier González-Gallego and Luis Fontana, researchers from the University of Granada and University of León.

Research in rats

In order to evaluate the regenerative potential of HUCBM cells, researchers carried out a human-to-rat xenograft. First, liver cirrhosis was induced to rats by administration of 0.3 g/L thioacetamide (TAA) in drinking water throughout 4 months. Later on, ten million HUCBM cells were injected through the portal vein. A similar transplantation experiment was done in control rats, i. e., rats that drank water, not TAA.

TAA induced nodular cirrhosis to animals. Cell therapy did not have any effect on hepatic histology, but analysis of biochemical parameters revealed that cirrhotic rats subjected to transplantation exhibited alterations in liver function (lower albumin concentration and higher bilirubin concentration in plasma compared to cirrhotic rats that did not receive HUCBM cells). Also, the group with cirrhosis that received HUCBM cells showed renal damage.

Nowadays, approximately 17% of the world population is affected by liver diseases. There is to date no specific treatment for the liver fibrosis that develops in chronic hepatic diseases, and patients receive treatment for its associated complications. In addition, the current therapy for end-stage hepatic disease, whole liver transplantation, is limited by the shortage of organ donors. Accordingly, novel therapies, such as the use of cord blood stem cells, are required to alleviate the suffering of many patients. This work, however, highlights the need of further research in the area of hepatic regenerative medicine.

The work will appear in the November issue of the journal *Cell Transplantation*.

Source: University of Granada

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