Placenta-derived stem cells may help sufferers of lung diseases

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An Italian research team, publishing in the current issue of *Cell Transplantation* (18:4), has found that stem cells derived from human placenta may ultimately play a role in the treatment of lung diseases, such as pulmonary fibrosis and fibrotic diseases caused by tuberculosis, chemical exposure, radiation or pathogens. These diseases can ultimately lead to loss of normal lung tissue and organ failure. No known therapy effectively reverses or stops the fibrotic process.

Placenta-derived stem cells are known to be able to engraft in solid organs, including the lungs. Human term placenta stem cells also demonstrate characteristics of high plasticity and low immunogenicity.

"The potential application of fetal membrane-derived cells as a therapeutic tool for disorders characterized by inflammation and fibrosis is supported in previous studies," says Dr. Ornella Parolini, the study's lead author. "In line with the hypothesis that cells derived from the amniotic membrane have immunomodulatory properties and have been used as an anti-inflammatory agent, we set out to evaluate the effects of fetal membrane-derived cell transplantation in chemically-treated (bleomycin) mice."

According to Dr. Parolini, cells delivered via intra-peritoneal transplant, regardless of the cells being allogenic or xenogenic (host's own cells or from another individual respectively), the procedure resulted in a significant anti-fibrotic effect on the lab animals. A "consistent" reduction in lung fibrosis, says Dr. Parolini, "provides convincing proof"

that placenta-derived cells do confer benefits for bleomycin-induced lung injury. While the severity of inflammation did not show an overall reduction, there was a marked reduction in neutrophil (white blood cell) infiltration after both xeno-and-allo-transplantation.

"It is worth noting," says Dr. Parolini," that the presence of neutrophils is associated with poor prognosis for several lung diseases. However, the mechanism by which placenta-derived cells might affect infiltration by neutrophils is not known."

The researchers speculated that these cells may produce soluble factors that induce anti-inflammatory effects.

"Our findings suggest that fetal membrane-derived cells may prove useful for cell therapy of fibrotic diseases in the future," concludes Dr. Parolini.

Dr. Cesar Borlongan, of the University of South Florida and associate editor for Cell Transplantation, notes that the present study adds an important application of placenta cells, indicating their therapeutic effects in lung diseases. The cells' ability to reduce neutrophils possibly via secreted anti-inflammatory factors implies their use either as autografts or allografts, thereby increasing the numbers of the target patient population.

More information: www.ingentaconnect.com/content/cog/ct

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