

## Stem cells therapy for idiopathic pulmonary fibrosis

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Idiopathic pulmonary fibrosis (IPF) is a progressive disease of the lungs that gets severe over time and results in scarring or fibrosis of the lungs for unknown reasons. As time progresses, due to fibrosis in the lungs, the lungs cannot receive enough oxygen and it becomes difficult for the patient to breathe. The damage caused by IPF in the lungs cannot be cured or repaired. However, proper medication and stem cell therapy are known to reduce the symptoms and aid in improving the quality of life. The pathogenesis and research on IPF are still ongoing. Recent research suggests that stem cell therapy shows promising results in patients suffering from IPF. Stem cell therapy promotes the wound healing capacity of the alveolar epithelium in the lungs. A study shows that the transplantation of mesenchymal stem cells (MSCs) of different cellular origins, such as from umbilical cord, bone marrow and adipose tissue shows good results in several chronic, untreatable and deadly diseases, such as Parkinson's disease, congestive heart failure, diabetes mellitus type II and myocardial infarction. A number of studies investigated that MSCs play a great role in supporting migratory, differentiation and reparative capacity in animal models of lungs suffering from inflammation and fibrosis. The umbilical cord MSCs have been known to show their potential in differentiating into alveolar type II epithelial cells under specific microenvironments; whereas, certain research also addresses the safety, feasibility and tolerability of adipose-derived stem cells as a therapeutic modality in IPF patients. There is sufficient evidence that proves the presence of adult lung stem cells in the lungs. Further, several lung cell types are known to proliferate and build up the lung epithelium. The differentiated mature epithelial cells and newly acknowledged local epithelial progenitor cells reside in specialised niches and may participate in the lung repair process. These cells have self-renewal capacity and are able to produce more unspecialised cells. They can also give rise to daughter cells known as progenitor cells. These progenitor cells are noted to have a definite life span and good proliferative potential. Some examples of these cells are toxin-resistant cells, Clara cells, basal cells etc. Adult lung stem cells are also noted for their contribution to healing lung tumorigenesis. Hence, stem cell therapy is one of the possible and currently available methods that can give promising results in patients suffering from idiopathic pulmonary fibrosis.

*Keywords: Idiopathic pulmonary fibrosis, Adult lung stem cell, Mesenchymal stem cells, Adipose-derived stem cells, Stem cell therapy*

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