THE POTENTIAL OF WHARTON'S JELLY DERIVED MESENCHYMAL STEM CELLS IN TREATING PATIENTS WITH CYSTIC FIBROSIS

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Cystic fibrosis (CF) is a life-threatening autosomal recessive multi-organ disorder with the mean prevalence of 0.737 per 10 000 people worldwide. Despite many advances in therapy, patients fail to archive satisfactory quality of life. The end-stage lung disease still accounts for significant mortality and puts patients in the need of lung transplantation. Even though the disease is monogenic, the trials of topical gene transfer into airway epithelial cells have been disappointing so far. It is proven that stem cells can be differentiated into type II epithelial alveolar cells. The Wharton's jelly derived MSC from non-CF carrier third-party donors could be an effective alternative to bone marrow or embryonic stem cells. The harvesting process is an easy and ethically uncontroversial procedure. MSC should be applied through repetitive infusions due to rapid lung epithelial cell turnover. However, the low stem cell incorporation remains a problem. Preclinical studies imply that even 6-10% of wild-type CFTR expression could be enough to restore levels of chloride secretion. The route of administration, the optimal dose as well as intervals between infusions have yet to be determined. This review discusses clinical potential of mesenchymal stem cell application in patients with CF.

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