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Contents

Monthly Volume 16 Number 8 August 26, 2024

EDITORIAL

773 Pretreatment can alleviate programmed cell death in mesenchymal stem cells

Wan XX, Hu XM, Zhang Q, Xiong K

780 Mesenchymal stem cells: A promising therapeutic avenue for non-alcoholic fatty liver disease

Cheng CH, Hao WR, Cheng TH

MINIREVIEWS

784 Understanding and controlling the variables for stromal vascular fraction therapy

Jeyaraman N, Shrivastava S, Ravi V, Nallakumarasamy A, Pundkar A, Jeyaraman M

799 Bone marrow mesenchymal stem cells in treatment of peripheral nerve injury

Zou XF, Zhang BZ, Qian WW, Cheng FM

ORIGINAL ARTICLE

Basic Study

811 Microvesicles derived from mesenchymal stem cells inhibit acute respiratory distress syndrome-related pulmonary fibrosis in mouse partly through hepatocyte growth factor

Chen QH, Zhang Y, Gu X, Yang PL, Yuan J, Yu LN, Chen JM

LETTER TO THE EDITOR

824 Potential plausible role of Wharton's jelly mesenchymal stem cells for diabetic bone regeneration

Zheng S, Hu GY, Li JH, Li YK

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Contents

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AIMS AND SCOPE

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LETTER TO THE EDITOR

Potential plausible role of Wharton's jelly mesenchymal stem cells for diabetic bone regeneration

Sheng Zheng, Guan-Yu Hu, Jun-Hua Li, Yi-Kai Li

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Abstract

This letter addresses the review titled "Wharton's jelly mesenchymal stem cells: Future regenerative medicine for clinical applications in mitigation of radiation injury". The review highlights the regenerative potential of Wharton's jelly mesenchymal stem cells (WJ-MSCs) and describes why WJ-MSCs will become one of the most probable stem cells for future regenerative medicine. The potential plausible role of WJ-MSCs for diabetic bone regeneration should be noticeable, which will provide a new strategy for improving bone regeneration under diabetic conditions.

Key Words: Wharton's jelly mesenchymal stem cells; Vascular endothelial growth factor; Osteogenesis; Angiogenesis; Diabetic bone regeneration

Core Tip: Both osteogenesis and angiogenesis are closely related to bone regeneration. Diabetes mellitus normally impairs angiogenesis, which leads to diabetic bone regeneration deficiency. Wharton's jelly mesenchymal stem cells not only possess the ability to differentiation into osteoblasts, but also produce a crucial secretory factor (vascular endothelial growth factor) to promote angiogenesis. Thus, Wharton's jelly mesenchymal stem cell is expected to exert more vital role in improving diabetic bone regeneration.

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TO THE EDITOR

Recently, we read an insightful review entitled, "Wharton's jelly mesenchymal stem cells: Future regenerative medicine for clinical applications in mitigation of radiation injury" by Sharma and Maurya[1], published in the *World Journal of Stem Cells*. This review highlights the regenerative potential of Wharton's jelly mesenchymal stem cells (WJ-MSCs) and explains the reason that WJ-MSCs are among the most promising stem cells for future regenerative medicine. This letter is a pivotal addition to the role of WJ-MSCs in regenerative medicine, highlighting the potential of WJ-MSCs to improve diabetic bone regeneration.

MSCs have great potential in regenerative medicine because of their ability for self-renewal and multilineage differentiation. Recently, increasing evidence has indicated that MSCs produce secretory factors that are crucial in regenerative medicine[2]. WJ-MSCs of the umbilical cord produce abundant secretory factors, including vascular endothelial growth factor (VEGF)[3]. VEGF is crucial in promoting angiogenesis. Therefore, the important role of VEGF is highly valued in tissue regeneration.

Bone is a highly vascularized tissue[4]. Osteogenesis and angiogenesis are closely associated with bone regeneration [5]. Therefore, angiogenesis should be studied during bone regeneration. Diabetes mellitus impairs angiogenesis, leading to deficient diabetic bone regeneration[6]. WJ-MSCs not only possess the ability to differentiate into osteoblasts but also produce a crucial secretory factor (VEGF) to promote angiogenesis. Additionally, WJ-MSCs have several advantages, such as no ethical concerns, shorter population doubling time, and broad differentiation potential, which make them superior to other sources of MSCs[7]. Therefore, WJ-MSCs may be vital in improving diabetic bone regeneration.

Knowingly, no previous studies have discussed the use of WJ-MSCs therapy for diabetic bone regeneration. A previous study reported that special AT-rich sequence-binding protein 1 promotes the osteogenic differentiation of diabetic rat bone marrow-derived MSCs through mitogen-activated protein kinases signaling activation[8]; however, no study has focused on the role of WJ-MSCs in improving diabetic bone regeneration. This letter provides a new strategy for improving bone regeneration under diabetic conditions.

FOOTNOTES

Author contributions: Zheng S and Li YK wrote the original draft; Zheng S, Hu GY, Li JH, and Li YK contributed to conceptualization, writing, reviewing and editing. All authors have read and approved the final version of the manuscript.

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