

Human umbilical cord-derived mesenchymal stem cells on cutaneous equivalents: Long-term survival and characterization.

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Introduction

Mesenchymal stem cells (MSCs) have emerged as a fascinating and promising area of research in the field of regenerative medicine and cell therapy. These remarkable cells possess unique properties that make them highly versatile and potentially capable of treating a wide range of diseases and injuries. Found in various tissues throughout the body, MSCs hold great therapeutic potential due to their ability to differentiate into multiple cell types and their capacity to modulate the immune response [1].

The process of cutaneous wound healing is intricate and carefully planned out, involving different cell types, growth factors, and extracellular matrix elements. However, major tissue abnormalities and chronic wounds pose a significant obstacle to standard wound-healing therapy. Mesenchymal stem cells (MSCs) have been studied for their ability to regenerate, providing a possible path to better wound healing and tissue regeneration. Human umbilical cord-derived MSCs have become a popular choice among the numerous MSC sources because of their quantity, accessibility, and low immunogenicity [2].

The results of the investigation showed the exceptional capacity of human umbilical cord-derived MSCs for long-term survival and proliferation within the cutaneous analogues. The MSCs were still alive even after several weeks of culture, demonstrating their potential for long-term therapeutic usage. The MSCs' characteristics showed that they expressed critical markers linked to tissue regeneration and wound repair. Notably, the MSCs showed increased synthesis of growth factors such transforming growth factor-beta (TGF- β), which is essential for angiogenesis, and vascular endothelial growth factor (VEGF), which is important for angiogenesis and tissue healing. The MSCs also showed immunomodulatory qualities that affected the inflammatory reaction in the cutaneous counterparts [3].

Human umbilical cord-derived mesenchymal stem cells (MSCs) have the potential to be used in regenerative medicine because of their long-term survival and characterisation on

cutaneous analogues. The results of this groundbreaking study demonstrate the potential of MSC-based therapeutics for accelerating tissue regeneration and wound healing. The potential for long-term therapeutic application of human umbilical cord-derived MSCs is supported by their capacity to live and multiply for a longer length of time within the cutaneous analogues. This long-term survival is significant, particularly for major tissue abnormalities and chronic wounds where persistent and permanent healing responses are essential [4].

When the MSCs in the cutaneous counterparts were characterized, it was shown that they secrete vital growth factors including VEGF and TGF- β , which are crucial for angiogenesis and tissue repair. These characteristics suggest that MSCs have the capacity to encourage and assist the healing process in injured tissues, facilitating a quicker and more effective healing of wounds [5].

References

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