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Application of Stem Cells Conditioned Medium in Regenerative Medicine

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Data of the use of stem cells in various diseases are accumulating. Some studies reported beneficial effects of stem cell therapy in degenerative diseases such as myocardial infarction and revealed that stem cells cause tissue repair due to their ability to secrete trophic factors that exert beneficial impact on the damaged tissue, rather than their capacity to differentiate into the needed cells. Various studies on stem cell-derived secreted factors showed that the secreted factor alone without the stem cell itself may cause tissue repair in various conditions that involved tissue/organ damage. The secreted factors are referred to as secretome, microvesicles, or exosome and can be found in the medium where the stem cells are cultured; thus, the medium is called conditioned medium (CM.(

The use of secretome containing CM has several advantages compared to the use of stem cells, as CM can be manufactured, freeze-dried, packaged, and transported more easily. Moreover, as it is devoid of cells; there is no need to match the donor and the recipient to avoid rejection problems. Therefore, stem cell-derived conditioned medium have a promising prospect to be produced as pharmaceuticals for regenerative medicine.

To date, no clinical trial that used CM for a certain disease has been reported, except two pilot studies on the use of adipose derived mesenchymal stem cell CM for hair follicle regeneration and fractional carbon dioxide resurfacing wound healing in human, which showed good results. The use of CM for therapy is very appealing and may be booming in the near future, as studies on the use of CM for various diseases are accumulating. Conditioned medium contains various growth factors and tissue regenerative agents, which were secreted by the stem cells. The fact that stem cells secrete various growth factors was also shown by various proteomic studies, which revealed the presence of various growth factors and other cytokines in the CM. However, various studies reported the use of various kinds of stem cells and various methods to get the CM to cure various kinds of degenerative diseases in various animal models .

Key Words: Stem Cells, Conditioned Medium, Regenerative Medicine.

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