

Abstract

Mesenchymal stem cells (MSCs) are multipotent cells with the capacity to differentiate into cell lineages such as osteoblasts, adipocytes and chondrocytes. They maintain homeostasis in organism and contribute to wound healing and tissue regeneration. Usually, they are isolated from bone marrow or adipose tissue and they are primarily studied in regenerative medicine. Stress reaction is neurohumoral preparation for “fight or flight”, that occurs in response to physical or mental stressors. However, chronic stress has a negative impact on organism; it causes gradual exhaustion and damage in the whole body. Main hypothesis of this study is that stress hormones and neurotransmitters affect MSCs, which subsequently results in disturbed homeostasis and integrity of organism, delayed wound healing and attenuated tissue regeneration. Stress hormones influence quality and function of MSCs, especially their capabilities of differentiation, migration to wounded tissue and production of bioactive molecules.

Key words: mesenchymal stem cells (MSCs), catecholamines, hormones, dopamine, nervous system, stress