Abstract

Maintaining of homeostasis is essential for the survival of the organism. Stress disturbs the homeostasis and prepares the organism for mental or physical stress. During the stress situation, the endogenous stress factors are released. Through these factors stress affects tissue regeneration, the immune system and other metabolic processes. Chronic stress impacts many parts of body and mind and has a negative effect on these processes. Acute stress has the opposite effect. Mesenchymal stem cells (MSCs) participate in regenerative processes and modulate the immune system. Therefore, it can be assumed that stress will affect on MSCs. The aim of this study was to investigate the effect of stress factors, norepinephrine and corticosterone on the properties and function of MSCs in acute and chronic stress model. In our study, stress factors did not affect the morphology, vitality and differentiation of MSCs. However, the metabolic activity of MSCs was reduced regardless of the duration of their action. The action of stress factors also affected the production of some immunologically relevant molecules and proteins. Unfortunately, the results did not show a clear effect of stress factors on the lymphocyte modulation by MSCs.

Key words: mesenchymal stem cells, catecholamines, adrenergic receptors, glucocorticoids