

41. STRESS-INDUCED HAIR GRAYING: FACT OR FICTION?

Author: Vieru Daniela

Scientific adviser: Tatiana Globa, Department of Histology, Cytology and Embryology, *Nicolae Testemitanu* State University of Medicine and Pharmacy of the Republic of Moldova.

Introduction. Hair colour is determined by a special group of cells called melanocytes, which produce the melanin. Hair melanocytes, in contrast to epidermal ones, undergo apoptosis at the end of each follicular cycle. New cells arise from melanocyte stem cells that are located within the hair follicle. Stem cells number slowly decreases with age, and the new grown hair has less pigment. Hair graying is a complex process associated with both genetic and environmental factors. The persuasion that acute stress could hasten hair graying is a common belief that needs scientific provement.

Aim of study. The purpose of this study is to establish the relationship between acute stress and the morphological and pathophysiological changes in the hair follicle melanocytes.

Methods and materials. This review represents a synthesis of literature and meta-analysis of data of the numerous scientific researches.

Results. In humans, the bulge and hair germ region is the only source of melanocyte stem cells (MeSCs). Each follicle is initially loaded with a pool of melanocyte progenitors. These cells express glucocorticoid and β 2-adrenergic receptors. They are normally quiescent, except during the anagen phase, when they generate mature melanocytes, respectively a new pigmented hair. In the catagen phase, differentiated melanocytes die. The adrenal glands are releasing catecholamines and glucocorticoid hormones into the bloodstream as a response to physical or psychological stress. However, there were no changes in the hair pigmentation when the levels of glucocorticoids increased. Scientific data suggested that catecholamines push the melanocyte stem cells out of quiescence state, facilitating the rapid division and differentiation of 50% of MeSCs comparatively to 6% of proliferating MeSCs in anagen phase, that lead to seriously migration of melanocytes away from the bulge which remain without stem cells.

Conclusion. Hair graying occurs in hair follicles in order to maintain melanocyte stem cells in their niches. The acute stress really causes a sharp and irreversible depletion of follicular melanocyte stem cells. Sympathetic nervous system hyperactivation overstimulates the pathway, which drives to the hair graying. Based on the recent results, the hair graying could be prevented by topically blocking the sympathetic release of hormones or its receptors. The hair graying is independent of increased stress glucocorticoids. Understanding how our body reacts to stress is the first key step towards the future treatment.