PREMATURE HAIR GRAYING: FACTORS THAT CONTRIBUTE THE MECHANISMS OF THE PROCESS

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Introduction

Hair is a complex structure that protects the human body from the influence of environmental factors. Nevertheless, its principal function is esthetic. Luxurious, evenly pigmented, well-groomed hair accompanied by healthy skin is the reason for the flawless appearance.

We are all different. The 9-15% of the population has blonde, yellow, and red, and the rest – have straight or curly black hair. The hair color usually indicates a person's age, and, for most people, gray hair is a sign of near-old age and the fading of former beauty.

Hair graying is a process of aging. The temples and the front of the head begin to turn gray first, after gray hair covers the entire hair, evenly distributed in all zones. Graying can start from the roots of the hair and gradually rise, but sometimes colored hair falls out and is replaced by the gray one.

If gray hair occurs before the age of 20 years in the European population or before 25 years in the Asian, then we are talking about hair graying prematurely. It is one of the major factors that cause a lowering of the person's self-esteem and often disrupts social adjustment. [1]

Methods and materials.

Since premature hair graying is a widespread occurrence, nowadays, we intend to understand the mechanisms of this process by analyzing the available publications on the existing problem.

Results.

Evaluating the multiple scientific publications on Google Scholar and PubMed, we discover that the pathogenesis of premature hair greying is unclear; however, it can be a reversible or irreversible process. Besides genetics, various factors,
including environment (lifestyle, nutrition, ecological factors, and general health, endocrine disorders in particular), play a role in the loss of melanin, in most cases due to the reduction of melanin-producing cells.

As the hair is a part of the skin, its pigmentation depends on melanogenesis at the level of the hair follicle. This process is controlled by melanin-stimulating hormone (MSH), adrenocorticotrophic hormone, endothelin-1, prostaglandins, leukotrienes, neutrophils, fibroblast growth factor, nitric oxide, catecholamines, vitamins, and minerals.

Melanocytes are constantly breaking down and renewing themselves. New ones are created from stem cells, and it is these cells, according to researchers, that "get stuck" in a suspended state in people whose hair is gray. The stem cells stop moving in the follicle and die, thus not maturing into full-fledged melanocytes. Due to the absence of pigment, the hair becomes gray, white, or silver.

From a chemical point of view, hair is a complex compound consisting of oxygen, carbon, nitrogen, water, and sulfur. Therefore, oxidative stress and microelements disturbance are the most discussed statements.

Stressful life destroys the body's antioxidant system and, as a result, leads to the accumulation of reactive oxygen species that damage the melanocytic units.

Lack of vitamins A, B, C, and B12; zinc, iron, copper, manganese, and selenium deficiency due to malabsorption, smoking, alcohol abuse, or an unbalanced diet can be the reason for reversible graying. [2] Therefore, taking the supplements complex in such cases may restore hair pigmentation.

Taking drugs for Parkinson's disease, chemotherapy, target cytostatics, topical photosensitizers, resorcin, Dithranol, and regular use of antibiotics affects the regulation of melanin production.

Genetic predisposition, diseases of the thyroid gland and problems with the pituitary gland, vitiligo, pernicious anemia, progeria, Brook's syndrome, celiac disease, microcirculation disorders, and many other conditions may be the underlying causes of premature graying too. [3]

An exceedingly newsworthy fact about how food interferes with the absorption of vitamins is highly discussed among some experts nowadays. For instance, an orange, containing a lot of ascorbic acids, blocks the absorption of a cooper; raw eggs prevent the biotin absorption; alcohol can impair B vitamin absorption; nuts, grains, beans, and seeds -ferritin assimilation; nicotine gum can cause iron deficiency.[4]

**Conclusion.**

Whatever the reason, the problem of early graying is quite relevant. As of today, despite a deep understanding of the condition essence, it is impossible to slow down or reverse the activated mechanism in most cases. Therefore, the best option is prevention.

This undesirable phenomenon rectification is possible by improving life standards and strengthening the oxidation system of our body. Well-balanced nutrition, giving up bad habits, and health problem corrections are the minimum and first steps in achieving a result in the fight against premature graying, which does not have a genetic prerequisite.
Scalp massage, hair mesotherapy, and plasma lifting are additional recommendations. They help control the progression of graying via microcirculation stimulation and regulation of melanogenesis.

Today, hair dye is the only “treatment” for graying. However, since the essential cause of premature hair graying is the progressive loss of melanocyte stem cells, scientists in the trichology field are actively working on a therapy that would reactivate them. And our expectation is the successful results of their efforts.

References: