

## Premature graying of hair-risk factors, comorbid conditions, pharmacotherapy and reversal: A systematic review and meta-analysis

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### Abstract

Although Premature Graying of Hair (PGH) is becoming an increasingly common entity, its risk factors, co-morbid conditions, pharmacotherapy and reversibility is not properly addressed in literature. Therefore this systematic review was conducted. We searched 6 databases (PubMed, EMBASE, OVID, Web of Science, Scopus and Google Scholar) with appropriate keywords for relevant literature. Database files were extracted using EndNote and title and abstracts were screened using Rayyan, QCRI. Full texts of the relevant articles were further screened as per predefined inclusion-exclusion criteria. Review manager 5.3 was used for meta-analysis. PROSPERO registration id for the study is CRD42019122159. A total of 92 studies were included after full text screen. In meta-analysis, among various risk factors, smoking, vitamin deficiency (B12, folic acid and B7), mineral deficiency (low serum calcium and serum ferritin) were found to be associated with PGH ( $p < 0.05$ ). Other important risk factors were family history of PGH, obesity, high BP, lack of exercise, drugs, genetic syndromes, dyslipidemia, thyroid disorders, hyperuricemia and alteration in liver function. PGH can represent an important marker of CAD, more so in case of smoker. Among different pharmacotherapeutic options, important agents are calcium pantothenate, PABA, calcium pantothenate+PABA combination. Anu-thailam is the only herbal agent evaluated in clinical research settings. Finally, treating the accompanying pathologies may lead to the reversal of the disease. So, to summarize, a detailed clinical history and examination with special emphasis to signs and symptoms of vitamin and mineral deficiency, risk factors and comorbid conditions is the key factor in treatment of PGH. Premature graying of hair (PGH) being a very common entity for which pharmacotherapy and reversibility are not properly addressed. Therefore, this systematic review was conducted to address these issues. For this relevant study were selected from various databases including PubMed, EMBASE, OVID, Web of science, Scopus, and Google Scholar till January 20, 2019. Studies which reported risk factors, co-morbid conditions associated with PGH, its pharmacotherapy and reversal were included in the study. Although many risk factors are reported in literature, smoking, vitamin deficiency (B12, folic acid, and B7), mineral deficiency (low serum calcium and serum ferritin) are found to be associated with PGH. Other important risk factors are family history of PGH, obesity, high B.P, lack of exercise, drugs, genetic syndromes, dyslipidemia, thyroid disorders, hyperuricemia, and alteration in liver function. PGH is found to be an important marker of CAD, more so

in case of smoker. Among different pharmacotherapeutic management options, low grade recommendation (2A) is given to calcium pantothenate, PABA, calcium pantothenate + PABA combination. Anu-thailam is the only herbal agent evaluated in clinical research settings. Finally, treating the accompanying pathologies led to the reversal of the disease in many cases. The link will take you to an abstract of the article. NHS staff wishing to obtain a copy of the full text should contact their health care library. This article has been selected for inclusion in NICE Evidence Search because it meets the definition of a reliable systematic review for this service. This is a systematic review published by a journal which conforms to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standard. If not published by one of these journals, a systematic review is deemed reliable if the abstract reports the inclusion/exclusion criteria, confirms two or more sources have been searched, and incorporates a synthesis of included studies. In today's world, physical appearance and the desire to look young are very important. Skin and hair play a powerful role in this as they impart much information, not only about our race, ethnicity, and health but also about gender and age. We experience a significant change in pigmentation during our journey of life from birth to puberty and then to young adulthood, middle age, and beyond. Graying of hair is a conspicuous sign of aging. It is said that 50% of the people have 50% gray hair by the age of 50. Premature graying or premature canities is defined as graying that occurs before the age of 20 in Caucasians, before 25 in Asians, and before 30 in Africans. The pathogenesis of premature canities is not yet clear but various hypotheses have been suggested including alteration in pH and cysteine levels in melanosomes, the role of trace metal ions, vitamin B12 and folic acid, vitamin D3, and oxidative stress. Along with increased awareness, there is an increased demand for treatment modalities but the options are limited and unsatisfactory. Various topical preparations containing phytic acid, amino acids, peptides, acetyl hexapeptide-1, melitane, capixyl, pea proteins, etc. are already available in the market. Currently, research is focusing on topical liposome targeting melanins, genes, and proteins selective to hair follicles for therapeutic and cosmetic modification of hair. The association of hair greying with metabolic syndrome is not well known, while association with obesity and coronary artery disease has been suggested. A cross-sectional study was conducted to identify an association between premature hair greying and metabolic risk factors. Of the 1,929 young healthy

subjects (1,067 men and 862 women), 704 (36.4%) were categorized in the premature hair greying group. Waist circumference (means of non-premature hair greying vs. premature hair greying, 74.3 vs. 76.3 cm;  $p < 0.001$ ), systolic (109.2 vs. 111.7 mmHg;  $p < 0.001$ ) and diastolic (65.0 vs. 66.2 mmHg;  $p = 0.003$ ) blood pressures, and fasting blood sugar (90.8 vs. 91.6 mg/dl;  $p = 0.013$ ) were higher and serum high-density lipoprotein cholesterol (68.1 vs 65.4 mg/dl;  $p < 0.001$ ) was lower in premature hair greying group. Multivariate logistic regression analysis showed that metabolic risk factors  $\geq 2$  was independently associated with premature hair greying after controlling for confounding factors (odds ratio 1.725;  $p = 0.036$ ). The present study revealed an association between premature hair greying and metabolic risk factors.

### **Biography:**

Phulen Sarma has completed his MD in Pharmacology from Assam Medical College and DM in Clinical Pharmacology from PGIMER, Chandigarh. He is currently working as Scientist in PGIMER, Chandigarh, India. He is serving as a Chairman, Research Council, Medical Pharmacologists Society, India and also a Board Member. He has published more than 45 papers in international journals of repute and is serving as an Assistant Editor in Indian Journal of Pharmacology.