



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY



Epidemiological and Biochemical Factors (Serum Ferritin and Vitamin D) associated with Premature Graying of Hair

Thesis

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Dermatology, Venereology and Andrology*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبِقَانِكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

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List of Abbreviations

<i>AAP</i>	American Academy of Pediatrics
<i>BMI</i>	Body mass index
<i>CAD</i>	Coronary artery disease
<i>DM</i>	Diabetes mellitus
<i>DNA</i>	Deoxy Ribonucleic acid
<i>EILSA</i>	Enzyme-linked immunosorbent assay
<i>HDL</i>	High-density lipoprotein
<i>HDL-C</i>	High-density lipoprotein cholesterol
<i>HTN</i>	Hypertension
<i>IL</i>	Interleukin
<i>PABA</i>	Para-amino benzoic acid
<i>PC</i>	Personal computer
<i>PGF2α</i>	Prostaglandin F2 alpha
<i>PHG</i>	Premature hair graying
<i>PSS</i>	Perceived stress scale
<i>RNA</i>	Ribonucleic acid
<i>mRNA</i>	Messenger Ribonucleic acid
<i>ROS</i>	Reactive oxygen species
<i>SD</i>	Standard deviation
<i>SPSS</i>	Statistical package for Social Science
<i>TCM</i>	Traditional Chinese medicine
<i>TGF-B2</i>	Transforming growth factor-beta 2
<i>UV</i>	Ultraviolet
<i>UVB</i>	Ultraviolet-B
<i>αMSH</i>	Alpha melanocyte stimulating hormone
<i>μg</i>	Microgram

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ABSTRACT

Background: Premature graying of hair (PHG) is defined as graying of hair before the age of 20 years in Caucasians and before 30 years in Blacks. Several factors contribute to development of hair graying as genetics, environmental factors, life style and stressful events. Also, many biological markers were associated with development of hair graying as vitamin D, ferritin, vitamin B12 and many other electrolytes as calcium and magnesium.

Aim of the study: assess various epidemiological factors and biochemical variables (serum ferritin and vitamin D) associated with premature graying of hair.

Patients and methods: The current study included 75 premature hair graying patients, and 75 apparently healthy controls of matched age and sex. Assessment of epidemiological, clinical characteristics, estimation of serum levels of vitamin D and ferritin was done for included subjects.

Results: We detected positive correlation of life style, stress perception and family history with PHG development. No significant difference of vitamin D between the two groups, while low serum ferritin was significantly associated with PHG patients.

Keywords: premature hair graying, PSS-10, vitamin D and ferritin.

Introduction

Graying of hair is a sign of aging that depends on the progressive reduction of melanocytic function, although there is no universal consensus regarding gray hair count to define premature hair graying. (*Pandhi and Khanna, 2013*). The term premature hair graying (PHG) or premature canities is used when graying occurs before the age of 20 in Caucasians, 25 in Asians, and 30 in Africans (*Chakrabarty et al., 2016*).

As hair has an important role in people's social, and sexual communication, PHG can be annoying resulting in loss of self-esteem, especially in young people. The exact etiology of PHG is unknown, but it is considered that PHG occurs in genetically predisposed people exposed to various environmental factors. The relationship between PHG and some specific autoimmune diseases such as pernicious anemia, hyperthyroidism, and hypothyroidism has been reported (*Pandhi and Khanna, 2013*). Because hair graying is a clear indicator of biological aging, PHG was assumed to be an indicator of aging of organs; studies performed to explore the relationship between PHG and cardio vascular disease and osteopenia have had conflicting results (*Orr et al., 1997*). Smoking, family history, and obesity were found

to be associated with PHG in a recent study of young men (*Shin et al., 2015*).

Furthermore, the process of hair graying includes a decrease in melanogenesis enzymes, disruption of DNA repair, and loss of antioxidant mechanisms (*Commo et al., 2004*). Repressed catalase protein expression and hydroxyl radical scavenging activities were recently found in gray hair follicles, and therefore noted that PHG is a result of oxidative damage in hair follicle melanocytes (*Shi et al., 2014*).

Moreover, the relationship between oxidative stress and psychological disorders (emotional stress, anxiety, and depression), alcohol intake, and atherosclerosis has been reported previously (*Srivastava & Batra., 2014*).

Bhat et al., (2013) found that serum ferritin was significantly lower in cases as compared to controls. Similarly, *Chakrabarty et al., (2016)* observed that mean serum ferritin was significantly lower in cases as compared to controls. Many studies have postulated that iron affects melanogenesis. There is evidence provided by studies for the role of iron in the modulation of tyrosinase. It is reported that in a tautomerization reaction by dopachrome tautomerase, which is one of the later stages of melanin biosynthesis, the

isomerization of dopachrome to dihydroxyindole-2-carboxylic acid occurs. This enzyme is an iron (ferrous) dependent enzyme (*Chakraborty et al, 1992*).

Chakraborty et al. (2016) found that there was no statistically significant difference between serum Vitamin D levels in cases and controls. However, *Bhat et al. (2013)* had reported significantly lower levels of serum Vitamin D in patients of PHG compared to controls.