

Risk Factors Associated with Premature Hair Greying of Young Adult

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Abstract

Citation: Anggraini DR, Feriyawati L, Hidayat H, Wahyuni AS. Risk Factors Associated with Premature Hair Greying of Young Adult. *Open Access Maced J Med Sci.* 2019 Nov 30; 7(22):3762-3764. <https://doi.org/10.3889/oamjms.2019.498>

Keywords: Premature hair greying; Risk-factors; Young adult; Onset of greying

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Received: 25-Sep-2019; **Revised:** 17-Oct-2019; **Accepted:** 18-Oct-2019; **Online first:** 14-Nov-2019

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Funding: This study received financial support from the Universitas Sumatera Utara, Indonesia

Competing Interests: The authors have declared that no competing interests exist

BACKGROUND: Many researchers have been indicated that premature hair greying (PHG) may be associated with the multifactorial problem include genetic, trace elements deficiencies and some medical problems such as metabolic disorders. However, the risk factors for premature hair greying are not well known for young adult.

AIM: This study aimed to determine the risk factors of hair greying in young adult.

METHODS: We conducted a cross-sectional study recruited 100 respondents of a college student at the Universitas Sumatera Utara (USU) with the inclusion criteria: male, less than 25 years old with hair greying and not have skin pigmentation disorders. The questionnaires about greying of hair status, family history of greying and history of family disease were collected by self-report.

RESULTS: The age of participants in this study was 20.09 ± 2.01 years (mean \pm SD). The mean onset of PHG was 15.23 ± 3.52 years (range: 9 – 22 years). The family history of PHG was 39% with paternal in 262%; maternal in 10% and both parents in 3%. There was a significant difference between several grey hairs with a family history of PHG $P = 0.045$. The family history with metabolic disorders; hypertension was 29%, obesity was 25%, and diabetes Mellitus (DM) was 15%. Limitations: Owing to the use of questionnaires, the possibility of recall bias exists. The young female was not evaluated in this study.

CONCLUSION: The family history of PHG and onset of greying are important risk factors associated with PHG of a young adult.

Introduction

Hair greying is one of the natural processes that occur with chronological ageing, regardless of the gender or race [1], [2]. Although it is generally not a medical problem, it greatly concerns many people for aesthetic reason. Premature hair greying (PHG) is especially important as a cause of low self-confidence, often impeding social life in young people. Moreover, because of the strong association between ageing and hair greying, many studies have been showed that premature greying is a predictor of some severe systemic disease [3].

The age of greying varies with race and

ethnicity. Hair conventionally considered to grey prematurely only if greying occurs before 20 years old in Whites, before 25 years in Asians, and before 30 years in Africans [4], [5]. Although the primary cause of PHG may be genetic, studies have also reported the role of autoimmune disorders, smoking, and trace element deficiencies [5].

The previous study in Korea showed of the 6390 participants, 1618 (25.3%) presented with PHG was 20.2 ± 1.3 years (mean \pm SD). Family history of PHG (odds ratio [OR], 12.82), obesity (OR, 2.61), and > 5 pack-years history of smoking (OR, 1.61) were significantly associated with PHG. In the multivariate analysis, family history of PHG (OR, 2.63) and obesity (OR, 2.22) correlated with the severity of PHG [6].

The study of North India showed mean age at onset of greying was 10.2 ± 3.6 years (range: 5–19 years), with an almost equal gender distribution. The earliest age of onset recorded was 5 years. A positive family history of PHG (at least one of the biological parents or siblings) was obtained in 64 (90.1%) of the cases [7].

There have been many studies of PHG, but no study has been found in Indonesia and Medan (North Sumatra) in particularly. Therefore, this study was conducted to identify risk factors of PHG of a young adult in the USU area.

Material and Methods

This is a cross-sectional study of a college student at the Universitas Sumatera Utara area. This study was conducted at various faculties at the USU area such as Faculty of Medicine, Dentistry, Engineering, Public Health, Mathematics and Natural Science, Agriculture and Politeknik Negeri Medan. We recruited 100 samples should meet the inclusion criteria; young men less than 25 years old, have premature hair greying and does not have skin pigmentation disorders. Most of the samples were recruited through friends and participant connection.

The data were collected using questionnaires. Participants were asked about the presence of grey hair. The number of grey hairs was self-reported as follows: less than 100 and more than 100. The characteristic demographic samples and risk factors such as age, onset, family history of premature greying and history of the family disease (diabetes, hypertension, obesity) were collected.

The protocol of this study has been approved by Medical Ethics Committee Universitas Sumatera Utara (No.197 / TGL / FK / KEPK FK USU-RSUP HAM / 2018).

Unanswered questionnaire items were regarded as missing values. The mean \pm standard deviation (SD), number and percentage of participants were tabulated. We performed logistic regression analysis to identify risk factors of PHG were analysed with Chi-Square Tests and Fisher's Exact Test, * $P < 0.05$ were considered significant.

Results

This study included 100 participants with PHG, with age was 20.09 ± 2.01 years (mean \pm SD). The mean age onset of greying of 15.23 ± 3.52 years (range: 9–22 years). The earliest age of onset was 9

years. The majority of cases (55%) reported onset of greying 14-18 years of age; followed by the 9–13 years range 29%), and remaining at or more than 19 years old (16%). The number of grey hairs ≤ 100 was 84% cases, and several grey hairs > 100 were 16% cases. (Table 1). Statistically, there was a significant difference ($P = 0.001$) between several grey hairs with onset age of PHG.

Table 1: Characteristic PHG

Characteristic	Number of participants (n = 100)	Percent (100%)
Age		
17 - 19 years old	43	43
20 - 22 years old	44	44
23 - 25 years old	13	13
Onset of greying		
9 -13 years old	29	29
14-18 years old	55	55
≥ 19 years old	16	16
The number of grey hairs		
≤ 100	84	84
> 100	16	16

A positive family history of PHG (at least one of the biological parents) was obtained in 39% of the cases, most of the case was unaware (61%). Of the 39 cases, 36% reported PHG in one of the parents (26% in paternal and 10 % in maternal) and the remaining 3% reported in both the parents (Figure 1). Statistically, there was a significant difference between the number of grey hairs with a family history of PHG $P = 0.045$.

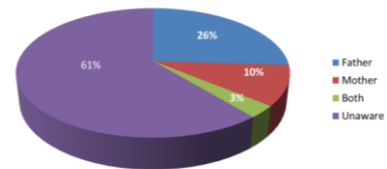


Figure 1: Family history of PHG

The majority history of the family disease of hypertension was obtained 29 cases, followed by obesity and diabetes mellitus respectively was 25 and 15 cases (Figure 2). Statistically, there was not a significant difference of $P > 0.050$.

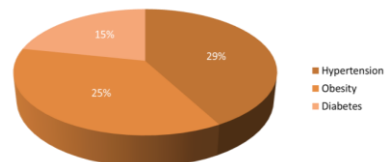


Figure 2: History of the family disease

Discussion

Hair plays an important role in physical appearance and self-perception. Ageing of hair consists of two components, namely, weathering of

the hair shaft and ageing of the hair follicle. Weathering of hair shaft involves degeneration of hair fibres that develop from the root to the tip. Ageing hair follicles refers to decreased melanocyte function (known as greying) and decreased hair production [8]. Hair greying is a physiological phenomenon that is considered to be a natural age-associated feature. The recent study showed the age of 50 years, 50% of the population will have at least 50% grey hair ("50" rule of thumb) reported that the global range of individual having 50% hair greying by the age of 50 years was between 6% and 23% [9]. The diversity of hair pigmentation in human beings ranges within physiological variations. However, it differs among the three major ethnic populations, namely, Asians, Africans, and Caucasians [9]. The age of greying varies with race and ethnicity. Hair has conventionally been considered to grey prematurely only if greying occurs before the age of 20 years in Whites, before 25 years in Asians, and before 30 years in Africans [4], [5].

In this study, the age of participants was 20.09 ± 2.01 years (mean \pm SD). The mean age onset of greying of 15.23 ± 3.52 years (range: 9 – 22 years). The number of grey hairs ≤ 100 was 84% cases, and several grey hairs > 100 were 16% cases. This is in line with the previous study; Shin et al. showed the age of participants in the main survey was 20.2 ± 1.3 years (mean \pm SD) [6]. Sonthalia et al. showed the mean age at onset of greying was 10.2 ± 3.6 years (range: 5–19 years), with an almost equal gender distribution. The earliest age of onset recorded was 5 years. A positive family history of PHG (at least one of the biological parents or siblings) was obtained in 64 (90.1%) of the cases [7]. Bath et al., showed among the 35 children, 11.5% had mild, 65.7% had moderate, and 23% had severe greying of hair. The mean age of studied cases was 16.8 years and mean age of onset of premature greying was 15 years. Male to female ratio was 1: 1.1 indicating a no sex predilection. All the children had a moderate built and nourishment. Parental history of premature greying was present in 42.6% of patients and siblings were involved in 14.2% of patients. It is interesting to observe that 8 (22.85%) cases also had vitiligo lesions in other parts of the body [5].

The family history of PHG was 39%, 36 cases reported PHG in one of the parents (26 cases in paternal and 10 cases in maternal) and the remaining 3 cases reported in both. Statistically, there was a significant difference between several grey hairs with a family history of PHG $P = 0.045$. This study accordance with Shin et al. that a family history of PHG was the most powerful risk factor for PHG. In particular, a paternal family history affects PHG more than a maternal history [6]. This might be because the onset of hair greying is earlier in men than in women [13]. Another hypothesis is that genetic factors affecting hair greying come from the father. These genetic candidates might be related to oxidative stress

or its defence system. The limitation of this study young women not evaluated in this study and owing to the use of questionnaires, the possibility of recall bias exists. To elucidate genetic effects in premature hair greying, a further study, including women is necessary.

The majority history of the family disease of hypertension was obtained 29 cases, followed by obesity and diabetes mellitus respectively was 25 and 15 cases (Figure 2). Statistically, there was not a significant difference of $P > 0.050$. In summary, the dominant risk factors in this study were onset of grey and family history associated with the incidence PHG of a young men college student at the USU area.

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