Dermatology

STUDY OF PREVALENCE OF PREMATURE GRAYING OF HAIR AMONG SCHOOL-GOING CHILDREN AGED BETWEEN 5-15 YEARS

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ABSTRACT

Introduction: Premature graying of hair is defined as graying of hair before the age of 20 years. There is renewed interest in this phenomenon in recent times.

Aim: To study the prevalence of premature graying in the study population

Methods: This is a descriptive study conducted on outpatients attending the department of dermatology, Amala Institute of medical Sciences, Thrissur and schools in and around Thrissur for a period of one and a half years on patients who were diagnosed clinically as premature graying of hair. A proforma was used to record relevant information (patient data, clinical findings) from individual patients selected with inclusion and exclusion criteria.

Results: Of the 1267 patients, 134 patients were found to have premature graying of hair.

Conclusion: The prevalence of premature graying of hair was found to be 10.6 % in the study population.

KEYWORDS : Hair graying, premature graying, hair, school, prevalence

INTRODUCTION

Premature graying of hair is defined as graying of hair before the age of 20 years.(1) Although a definite cut off to the number of gray hairs has not been established to complete the definition, a minimum of 5 gray hairs has been suggested [2] There is also a racial predilection to this phenomenon. Hair is said to be prematurely gray only if greying occurs before the age of 20 years in Whites, before 25 years in Asians, and before 30 years in Africans. (3) Various associations have been hypothesized regarding aetiology of premature graying including autoimmune diseases, genodermatoses as well as nutritional deficiencies. It can occur alone as an autosomal dominant condition or in association with other syndromes. The exact aetiology remains incompletely understood. There is also a dearth in effective treatment modalities.

The current knowledge of the pathogenesis of premature graying encompasses a genetic component with an autosomal dominant inheritance pattern, with involvement of multiple acquired and environmental factors including hypo- or hyper-thyroidism, atopic dermatitis, nutritional deficiencies like protein loss and deficiency of iron, vitamin B12 and copper, and HIV infection, Hodgkin's lymphoma and cystic fibrosis as well as stress, smoking and drugs. (4) There is a lack of epidemiological studies that give out the exact prevalence of this disease in the Indian population. Hence this study is undertaken to diagnose as well as determine the exact prevalence of premature graying of hair in a subset of Indian population.

Aim of study

To study the prevalence of premature graying of hair in patients aged between 5-15 years attending the outpatient Department of Dermatology and Venereology at Amala Institute of Medical Sciences, Thrissur and schools in and around Thrissur.

Objectives

1. To diagnose premature graying of hair in the study population
2. To determine prevalence of premature graying in the study population

METHODOLOGY

Study design
Descriptive study

Study setting
The study was conducted in patients attending the outpatient department of dermatology, Amala Institute of Medical Sciences, Thrissur and schools in and around Thrissur

Study period
The study was conducted for a period of one and half years (January 2017 – June 2018)

Study population
Outpatients attending the Dermatology department, AIMS, Thrissur and students of schools in and around Thrissur

SELECTION OF CASES
INCLUSION CRITERIA:
1. Age group: patients aged 5-15 years
2. Clinical diagnosis of premature graying of hair based on hair count

EXCLUSION CRITERIA:
1. Patients with known systemic disorders
2. Patients with conditions known to cause graying
   a. Progeria, Werner's syndrome, myotonic dystrophy, Book's syndrome, Fisch's syndrome, Rothmund-Thomson syndrome, ataxia-telangiectasia, Seckel's syndrome, Cri-du-chat syndrome, multiple lentigines syndrome
   b. Pernicious anaemia ,hypo /hyperthyroidism
   c. Drugs: chloroquine, triparanol, fluorbutyrophenone, mephenesin, dixyrazine, IFN-α
3. Those on any topical or systemic treatments (allopathic, Ayurvedic, home remedies,homeopathic or Unani) for any hair concern
4. Patients on immunosuppressants
5. Patients with immunocompromised status

SAMPLE SIZE
The sample size is 1267

DATA COLLECTION
After getting written informed consent from parents and school authorities, a proforma is used to record relevant information (patient data and clinical findings) from individual patients selected with inclusion and exclusion criteria Diagnosis of premature graying is made on clinical grounds by a qualified dermatologist. History and clinical examination is done in all patients and diagnosis is made when there is presence of more than 5 gray hairs. Graying is taken as mild when gray hair count is less than 10, moderate when count is 10 to 100, and severe when count is more than 100. Other questions regarding hair care practices, extracurricular activities and medical history is taken.

STATISTICAL ANALYSIS
Data was analyzed using statistical software SPSS version 23.0

Descriptive statistical methods such as percentage, mean and standard deviation were used to describe the background variables of the study population. Inferential statistics such as independent T test, Fisher's exact test and chi square test were used to compare different variables.

RESULTS
A total of 1267 patients were assessed in the present study, amongst which 134 had premature graying of hair (10.6%)

In our study, majority of the patients were in the age group of 12-15 years (80.8%), followed by <8 years (10.34%) , and the least was 9 to 11 years (8.84%). Of the 134 patients with premature graying, 123 were in the age group of 12 to 15 years.

The study group included 649 males and 618 females of age ranging from 5 to 15 years. There were 73 males and 61 females with premature graying of hair.

Age of onset
Of the 134 patients with premature graying, 78 had their onset after 10 years (58.21%),55 between 5 and 10 years (41.04) and one patient before 5 years (0.75%) Figure 3

Of the 134 patients with premature graying, 132 patients (98.51%) had an insidious onset and 2 patients had an abrupt onset (1.49%)

Of the 134 patients with premature graying, 96 had graying in the frontal area (71.64%) , 20 in the vertex area(14.93%) , 15 in the occipital area (11.19%) , 2 patients in the parietal region (1.49%) and one patient in the temple region (0.75%) .

Of the 134 patients with premature graying, 99 had 10 to 100 gray hairs (73.88%), 20 had <10 gray hairs (14.93%) and 15 had >100 gray hairs (11.19%).

Of the 134 patients with premature graying, majority of the patients (91.79%) had not taken any treatment. 4 patients each (2.99%) had taken Ayurveda and homeopathy.

Mode of current treatment
Of the 134 patients with premature graying,111 were not currently taking any treatment (82.84%), 20 were undergoing allopathic treatment (14.93%), 2 patients were on ayurvedic treatment (1.49%) and one patient homeopathy (0.75%) .

Medical history
Of the 134 patients with premature graying, 120 children had atopic dermatitis (89.5%), 13 had allergic rhinitis (9.7%) and one child had bronchial asthma (0.75%). Fisher's exact test p value 0.0001

Frequency of hair wash
Of the 134 patients with premature graying , 81 patients washed their hair daily (60.45%) and 53 washed their hair on alternate days (39.55%) (Fisher's exact test p value 0.0001)

Substance used for hair wash
Of the 134 patients with premature graying , 119 patients were using shampoos to wash their hair (88.8%) , 8 patients were using soap (5.9%) and 7 patients were using green gram powder (5.22%) (Fisher's exact test p value 0.0001)

Use of conditioner
Of the 134 patients with premature graying, 17 were found to be using conditioner (12.7%)

Regarding hair care practices, 7 patients each with premature graying had colored and straightened their hair (5.22%) (Fisher's exact test p value 0.0001)

Use of oil
Among the patients with premature graying , 133 patients were using oil (99.2%)

Regarding the type of oil used , coconut oil had the maximum number of patients , with 81 patients with premature graying using it (60.45%) , 50 patients using Ayurvedic oil (37.3%) , 2 patients using mustard oil (1.5%) and one patient using olive oil 0.75%) (Fisher's exact test p value 0.0001)

Among the patients with premature graying , 133 patients had seborrheic dermatitis (99.2) and one patient had pityriasis versicolor (0.75%) (Fisher's exact test p value 0.064)

Quality of hair
Of the 134 patients with premature graying , the hair of 113 patients was smooth (84.3%) and that of 21 patients was rough (15.7%)(Fisher's exact test p value 0.0001)

Of the 134 patients with premature graying of hair,2 patients had presence of split ends (1.49%) (Fisher's exact test p value 0.187)

DISCUSSION
There are very few studies addressing   the epidemiology of PHG in India. The impact of psychosocial trauma arising from PHG may become daunting for children and adolescents.

In our study , 134 (10.6%)   patients out of 1267 was found to have premature graying of hair. The majority of patients were in the age group of 12 to 15 years (n = 123,91.8%), followed by 7 patients in the age group 9 to 11 years and 4 patients below the age of 8.The mean age was 13.425 ±1.7786) . In a study by Sidharth Sonthalia et al, the majority of the patients were in the age group 0 to 10 years with mean age of onset at 10.2 ± 3.6 years.(94).

Of the 134 patients with premature graying, 73 (54.5%) were male and 61(45.5%) was female. A slight male preponderance was seen, but this was not statistically significant (p value 0.425). Similar to other studies, no gender predilection was found for PHG.

The mean age of onset was more than 10 years with 78 patients (58.21%). In the study mentioned earlier, the majority of the patients were in the age group 0 to 10 years with mean age of onset at 10.2 ± 3.6 years.(94). This discrepancy can be accounted for by the fact that the study population in the above study had a strong family history of premature graying, whereas the same was not obtained in our study. So it can be inferred that in our population the disease is acquired. Hence the cause of such occurrence is to be evaluated by further studies. The reason for the long gap before seeking medical help may be due to the benign nature of the condition and also due to use of henna for hair coloring , which some patients (n=7,5.22%) reported to be using. Hence , parents are not very much bothered. The mode of onset was found to be insidious (98.5%, n = 132) in our study.

In our study, the frontal area showed more involvement (71.6% , n = 96) followed by vertex(14.9% , n =20) , occipital (11.19% , n =15) , parietal(1.5% , n = 2) and temporal (0.75%, n = 1) ; which was in agreement with the study by Daulatabad et al who hypothesized that premature canities is distinct from chronological graying .(95) But, in the study by Sonthalai et al, a large majority of patients noticed it to arise from the temporal regions, followed by the frontal, vertex and occipital areas.(94) These findings suggest that PHG may be an early variant of chronological aging. In a study by Kocaman *et al*., the degree of PHG was found to be an independent risk marker for coronary artery disease which is a predictor of biological age. In the study by Sonthalai et al, a significant number of patients reported diffuse onset with no particular area mentioned as the site of onset. Conversely, racial variation is a contributor to the different pattern reported in different studies. In a Korean study, the parietal and occipital areas were observed to be involved first in cases with early onset of graying.

A positive family history was not obtained in any of the cases, which differed from other similar studies. In a study by Sonthalia et al, a positive family history of PHG of at least one of the biological parents or siblings was obtained in 64 (90.1%) of the cases. Hence, this was a contradictory point found in our study despite a strong genetic control and inheritance pattern of onset of hair graying. Many reports have indicated an autosomal dominant inheritance for premature graying, though it has not been proven. But, graying of hair is believed to have a multifactorial etiology that includes genetic component, environmental factors, endocrine abnormalities and nutritional status. [14] Hence, it can be inferred that genetics is only one of the factors that predispose to premature graying.

Most of the patients (91.8%, n = 123) had not taken any mode of treatment in the past. A few reported treatment with Ayurvedic and Homeopathic modalities. Currently, 20 patients were undergoing Allopathic treatment (14.9%), 2 patients Ayurveda (1.5%) and 1

patient Homeopathy (0.75%). Majority of the patients had a history of atopic diathesis (n = 120), a few reported allergic rhinitis (n = 13) and one patient had bronchial asthma. Earlier, Nigam et al and Lorincz AL established an association between graying and atopic diathesis. [97][98] Hence our study was in congruence with previous studies.

Regarding hair care practices, most of the patients were found to be washing their hair daily (n = 81, 60.45%). Majority of the patients were in the habit of using shampoo on alternate days (n = 119, 88.8%). A high number of patients were in the practice of using coconut oil (n = 81, 60.45%), followed by medicated, mustard and olive oils. No associations were found in any of these parameters. In a study by Swagata et al, patients with PHG had a sedentary lifestyle as compared to those who enjoyed a non sedentary lifestyle ($P = 0.006$). They also reported that the patients had irregular eating habits ($P < 0.001$). But in our study, all the patients with premature graying were engaged in some form of outdoor activity and had healthy balanced diets as well. This discrepancy can be explained by the fact that diet should meet the dietary demands of each individual. So even though diet appeared to be adequate, other factors like malabsorption and increased demand corresponding to the age should be accounted for. To establish this, larger studies using laboratory parameters is required.

The quality of hair was found to be smooth in most of the patients (n = 113, 84.3%). There was no presence of split ends in a majority of the patients (n = 132, 98.5%). This was a contradictory finding as gray hair is usually coarse, stiff and difficult to manage than pigmented hair.

CONCLUSION
1267 children between the age group 5 and 15 were assessed, of which 134 (10.6%) had premature graying of hair. Majority of the patients were in the age group of 12 to 15 . 96 had graying in the frontal area (71.64%). 120 children had atopic dermatitis (89.5%). Coconut oil was seen to be most used, with 81 patients with premature graying using it (60.45%). Most of the patients were found to be washing their hair daily (n = 81, 60.45%). Majority of the patients were in the habit of using shampoo on alternate days (n = 119, 88.8%).The quality of hair was found to be smooth in most of the patients (n = 113, 84.3%).

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