An Observational, Epidemiological Study on Pattern of Clinical Presentation and Associated Laboratory Findings in Patients of Premature Hair Graying

Sir,

Premature graying of hair is a condition whose exact etiology, and treatment is still considered as inconclusive. Multiple factors such as genetics, environmental factors, autoimmune disorders (such as pernicious anemia, hyper- or hypo-thyroidism), oxidative stress, nutritional deficiencies, and malabsorption, drugs are said to be implicated in the etiopathogenesis of premature graying.[1-4]

We conducted this cross-sectional, observational study to understand the clinical pattern, underlying micronutrient deficiencies, and endocrine abnormalities in 100 patients of premature graying. All patients with onset of hair graying before 25 years of age were recruited in the study. After taking informed consent, a detailed clinical history and laboratory investigations (including complete blood count, iron studies, thyroid function test, and serum Vitamin B12 levels) were done.

In our study, we have found that the incidence of graying was similar in men and women (n = 44 and n = 56, respectively). The age of patients ranged from 2 to 28 years, with mean age of onset of graying 15.1 ± 5.2 years. Nearly 29% of the patients gave positive family history of premature graying. It was surprising to find that none of our patients had vitiligo despite the fact that family history of vitiligo in first-degree relatives was present in 15% of our study patients [Table 1]. We suggest that premature graying can be an initial presentation, and these patients should be further followed up to look for any signs of vitiligo. In addition, frontal area was involved in majority (40%) of the patients. The onset of graying of scalp hairs varies according to gender. In majority of our male patients, occiput (36.4%) and frontal (34%) area were first to be involved whereas, in females, it was more commonly in the frontal area (44.6%) [Figure 1].

Autoimmune thyroid disease has been found to be associated with premature graying.[1,5] In our study, thyroid profile was deranged in 14% of the patients (mean thyroid-stimulating hormone level of 1.99 ± 1 mIU/L), out of which 13% had hypothyroidism [Table 2]. Due to lack of availability, antithyroid antibody profile of the patients

| Table 1: Relevant positive history in the study patients (n=100) |
|---------------------------------------------------------------|
| Positive history                                               | Number of patients |
| History of premature hair graying in family                   | 29               |
| History of vitiligo in family                                 | 15               |
| History of atopy                                               | 31               |
| History suggestive of thyroid disorder                         | 6                |
| Family history of diabetes mellitus                            | 2                |
| History suggestive of malabsorption                            | 4                |
| History of pulmonary tuberculosis in past                      | 2                |
| History of stress                                              | 3                |
| History of drug intake (antituberculosis treatment)            | 2                |
| History of protein-energy malnutrition                         | 3                |
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Table 2: Mean value of biochemical parameters and number of patients having deranged laboratory parameter

| Parameter                     | Mean±SD      | Number of patients with deranged lab value (%) | Normal values                      |
|-------------------------------|--------------|-----------------------------------------------|------------------------------------|
| Hemoglobin                    | 13.3±1.2 g/dl| 12                                            | Male: 14-18 g/dl                   |
|                               |              |                                               | Female: 12-15 g/dl                 |
| Serum ferritin                | 94.4±30.7 ng/ml| 5                                             | Male: 65-176 mcg/dl               |
|                               |              |                                               | Female: 50-170 mcg/dl             |
| Serum vitamin B12             | 255.6±52.5 pg/ml| 24                                            | 200-500 pg/ml                      |
| Thyroid-stimulating hormone   | 1.99±1 mIU/L | 14                                            | 0.4-4 mIU/L                        |

SD – Standard deviation

Figure 1: Percent number of study patients with the involved area of hair graying at the onset

A previous study from Southern India has shown significantly low levels of serum ferritin in premature graying patients.[5] In our study, low serum ferritin was present in 5% of the patients (mean-94.4 ± 30.7 ng/ml). However, anemia was present in 12% of the study patients (mean hemoglobin 13.3 ± 1.2 g/dl), out of which 16.6% had microcytic hypochromic and 83.4% had normocytic normochromic anemia. In addition, as hair follicle cells rapidly proliferate, they need sufficient supply of Vitamin B12 and folic acid for DNA synthesis. Hence, low serum levels of Vitamin B12 are also considered as one of the causes for premature graying. Premature cannitis has been seen to be associated with pernicious anemia.[4] Nearly 24% of our patients had low serum Vitamin B12 levels (mean-255.6 ± 52.5 pg/ml). Most of the patients (19%) with low serum Vitamin B12 levels had normal value of hemoglobin. Thus, these patients need to be further investigated for vitamin B12 deficiency even in the absence of anemia. These findings also suggest the coexistent deficiency of other micronutrients as a probable cause of anemia.

We conclude that nutritional factors and autoimmunity do play role in the pathogenesis of premature graying, as there were underlying anemia and thyroid dysfunction in our patients. We hypothesize that in patients who have associated nutritional deficiency and endocrine abnormality, correction of this condition can repigment their gray hairs.

Further studies with larger sample size and more extensive clinical assessment will help in better understanding of the underlying pathogenesis of premature graying as well as in identifying new therapeutic targets for its more effective management.

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Conflicts of interest

There are no conflicts of interest.

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