

## Original Research Article

# Study of quality of life in patients with premature graying of hair in Western Indian population

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## ABSTRACT

**Background:** Quality of life in patients with premature graying of hair is an under studied topic in Indian population. Its onset in adolescence may have a significant effect on the developing psyche of an individual sufferer impairing academic and work related performance and can be associated with low self esteem, low confidence which can further be associated with depression. Aim was to objectively evaluate the impact of premature canities on QoL and early identification of patients in need of medical and psychological intervention.

**Methods:** The impact on QoL was calculated with the help of a modified and prevalidated questionnaire based on the dermatology life quality index proposed by Finley and Kahn. One hundred patients with onset of canities before the age of 25 years were enrolled, after approval by the institutional ethical committee.

**Results:** The mean modified DLQI score recorded was  $14.3 \pm 6.76$ . Total of 71% patients were found to have a very large to extremely large effect on the QoL. Guilt, mood fluctuation and need for medical intervention were reported frequently. The comparison between DLQI scores of boys and girls was not significant.

**Conclusions:** Patients of premature canities were found to have profound impact on their QoL, attributable to their perception of the disease. Considering the age group affected, it could have a long-term detrimental effect on their psychological and social wellbeing.

**Keywords:** Quality of life, Canities, Dermatology life quality index, Mood fluctuation

## INTRODUCTION

Healthy hair is a sign of general well-being and youthfulness. The function of hair in human beings is being debated. Nevertheless, hair serves as a great aesthetic tool and means of non-verbal communication. Disorders of hair are known to be associated with marked impairment in the quality of life (QoL). The world health organization (WHO) defines QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live; and in relation to their goals, expectations, standards, and concerns." Various objective indices have been evolved to assess the impact of skin diseases on a patient's life; dermatology life quality index (DLQI) is one such simple

validated questionnaire that is often used in dermatological disorders.<sup>1</sup> Hair color and style can significantly alter the physical appearance of a person and thus alter his/her body image.

As graying is perceived as a sign of aging, premature graying of hair (PGH) can bear an adverse effect on the self-esteem of the individual.<sup>2</sup> Hair pigmentation is one such unique feature ranging from black, brown, red and blond. Eumelanin and pheomelanin are the two types of melanin present in the hair follicle. The diversity of hair color arises from the quantity and ratio of black-brown eumelanin and reddish-brown pheomelanin.<sup>3-4</sup> Graying of hair or canities also occurs with normal aging. However, the age at which it occurs varies in different races.

Premature graying is defined as graying of hair before the age of 20 years in Caucasians and before 30 years in Blacks. Definition of premature graying with respect to the Asian population is lacking.<sup>5</sup> A large population based study reported that 6 to 23% of people have 50% gray hair by 5th decade of life.<sup>6</sup> Exact etiology of graying remains incompletely understood. PGH can occur as an autosomal dominant primary disease. Premature aging disorders such as progeria and pangeria also present with PGH. Accumulation of hydrogen peroxide in hair follicles and absence of antioxidants such as catalase and methionine sulfoxide reductase as well as melanocyte apoptosis and oxidative damage is seen in gray hair follicles.<sup>7</sup>

Quality of life in people with premature canities can be significantly compromised. The incidence of self reported premature graying of hair is on rise.<sup>8</sup> Very few studies have covered the aspect of premature graying of hair on quality of life in an Indian set up.<sup>9</sup> We have evaluated the effect of premature canities on quality of life in an Indian population subset.

## METHODS

The study design is cross sectional study. Self reported cases of both sexes with premature greying of hair with onset before 25 years of age, who presented to the outpatient department of dermatology, Dr. D.Y. Patil medical college, Pune, during September 2018 to August 2020 were included. Patients with known systemic disorders such as liver or renal impairment were excluded and so were patients with a history of smoking and alcoholism. Pregnant and lactating females were also excluded from study. Moreover, subjects with conditions known to be associated with premature graying such as progeria, Rothmund-Thomson syndrome, Werner's syndrome, and other genodermatoses were also excluded. Patients fulfilling the above criteria were included in the study, after written informed consent was obtained from patients. Consent was obtained from parents/guardians in case of minors.

Definition of premature graying with respect to the Indian population is lacking, we have selected a cut-off age of 25 years; the rationale being that average age of onset of grey hair is in the late 30s among Asian population.<sup>6</sup> Modified and prevalidated questionnaire based on the DLQI proposed by Finley and Kahn, was used to assess the QoL in patients.<sup>10</sup> The questionnaire consisted of 10 questions; each having 4 response options graded from 0 to 3 (0 being no effect; 1-minimal effect; 2-moderate effect; and 3-severe effect). Thus, a maximum score of "3" and minimum of "0" was accorded to each question; thereby permitting a maximum and minimum score of "30" and "0", respectively, for the modified DLQI scores. The final modified DLQI score was categorized into five grades, i.e., 0-4. Higher scores on the scale implied a greater impact on the patient's QoL. It was self administered questionnaire and parents responses were

considered for younger children, who were unable to understand and answer certain questions.

The questionnaire was designed to evaluate the following aspects of QoL: patient's perception, psychological reactions, interpersonal relations, efficiency and participation at work, school, and the need for therapeutic intervention. Questions like how often the gray hair was noticed by others; did they try to conceal the gray; and whether they perceived the disease to be contagious, were used to evaluate patients perception. Another set of questions evaluated the psychological impact by evaluating the sense of guilt or embarrassment due to gray hair; the frequency of mood fluctuations or loneliness because of their condition; and the perception that graying is due to inadequate self-care.

Questions regarding their participation in social events or their ability to concentrate in work were used to know the impact of graying on patient's social and professional activities. Any arguments or brawls with friends/partner/relatives due to gray hair were suggestive of interpersonal relationships. Finally, the need felt for seeking medical help (medications, supplements, or medicinal oils) was also inquired. The final scores on the modified DLQI were calculated and statistically analyzed. Statistical software SPSS, version 17.0. was used for this purpose and a  $p < 0.05$  was considered as significant.

## RESULTS

A total of 100 patients were enrolled; of these, 53 were boys (53%) and 47 were girls (47%). The mean age of the participants was 16.19 years ( $SD \pm 4.7$ ). The median age was 16 years with an age range from 8 to 25 years. The mean duration of canities was 1.62 years at the time of presentation ( $SD \pm 1.18$ ). Majority (58) of these were 11–20 years old. The site of greying was temporal region in 38 patients, 35 had canities in frontal area, 18 in vertex and 9 had canities in occiput. Temporal was the most common area of the scalp involved. Apart from scalp other areas to involve were side burns in 10 patients, beard in 5, eye brow in 4; and moustache and axillary involvement was seen in 2 patients each. A positive family history of canities was observed in 34 patients.

The mean DLQI score was 14.3 ( $SD \pm 6.76$ ), the median DLQI score was 12 with a range of 5 to 30. A total of 49% of the subjects were found to have a very large effect on QoL (grade III) and 22% of the subjects had an extremely large effect on QoL (grade IV) (Figure 1). Majority of patients with higher DLQI score were in the range of 11 to 20 years. The comparison between DLQI scores of boys and girls was insignificant for all grades (Table 1). With regards to evaluation of perception/physical reactions, 80 subjects felt that their gray hair was noticeable and commented upon by their relatives and friends. As many as 72 subjects tried to hide their gray hair more than once. A total of 30 subjects considered the

disorder contagious and were afraid of sharing combs. Significant guilt and hesitation due to gray hair was noted in 50 subjects (Figure 2). Mood fluctuations attributed to

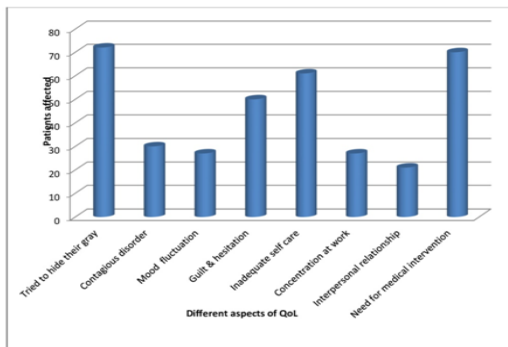
graying were reported by 27 subjects, whereas rest, 73 subjects denied any such effects.

**Table 1: Modified DLQI grades and its impact on QoL and gender comparison in study population.**

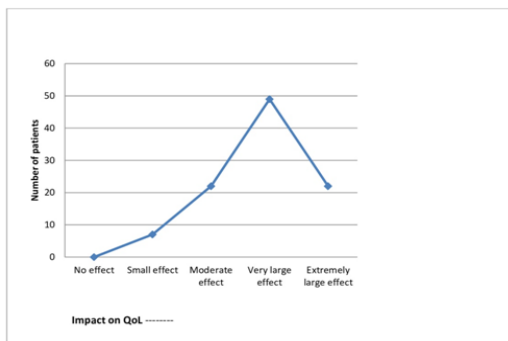
Grades	DLQI score	Impact on QoL	Male	Female	P value	%
0	0-1	No effect	0	0	0	0
1	2-5	Small effect	2	5	0.179	7
2	6-10	Moderate effect	12	10	0.869	22
3	11-20	Very large effect	28	21	0.415	49
4	21-30	Extremely large effect	11	11	1	22

It was observed that 61 subjects blamed their graying of hair on inadequate self care in terms of not consuming a healthy nutritious diet or due to lack of oiling of scalp regularly. Regarding the impact on social and professional domains, our study revealed 43 subjects were hesitant to participate in social events, while majority 73 of them never experienced any impairment of concentration at work. Arguments over graying of hair, affecting interpersonal relationships were denied by 79 subjects. Seventy subjects felt the strong need for an active therapeutic intervention.

profile as well as management. Quality of life can be significantly impacted due to premature canities. There is a steady increase in patients presenting with premature canities seeking medical care.<sup>9</sup> Various workers had evaluated quality of life in patients but studies are lacking in western Indian population. It assumes more importance as even a few strands of gray hair stand out prominently in Indian population, attributed to dark brown to black hair. As the disease affects young age group and is a cosmetic concern in majority, it is speculated to have a tremendous impact on the QoL of the patients, leading to psychological issues, low esteem and emotional distress.<sup>11</sup> The average age of onset of grey hair is in the mid-30s among Caucasians, late-30s among Asian population, and in the mid-40s among Africans population.<sup>6</sup>



**Figure 1: Impact of premature canities on quality of life in study population.**



**Figure 2: Impact of premature canities on different aspects of quality of life.**

**DISCUSSION**

Premature canities is a common but incompletely understood disorder in terms of etiopathogenesis, clinical

The mean age of the participants in our study was 16.19 years (SD±4.7) with an age range from 8 to 25 year. Similar north Indian study by Daulatabad et al evaluated QoL in 52 patients with onset of premature canities before 20 years, while Ashraf et al evaluated 63 patients with premature canities between 15 to 25 years.<sup>12,13</sup> Majority of affected patients were in the range of 11-20 years. The mean duration of canities was 1.62 years at the time of presentation (SD±1.18) in our study, while Bhat et al noted that average duration of premature canities at time of presentation was less than 5 years; which suggests its impact on QoL and increasing trend of seeking early medical intervention.<sup>14</sup> The temporal region was most commonly affected (38%) followed by frontal

area in 35% patients, which being the presenting areas of the scalp might be associated with early noticing of even few gray strands by friends and relatives, and resulting attempts to hide them by patients. The mean modified DLQI score of patients with premature canities was found to be very high, 14.3±6.76. Majority (49%) of the subjects had very large effect on QoL (grade III) while 22% of the subjects had extremely large effect on QoL (grade IV) (Figure 1). In a study by Daulatabad et al mean modified DLQI score recorded was 16.42±5.93.<sup>12</sup> There was no association between age, sex and severity of degree of premature canities with QoL, similar findings were observed by Ashraf et al which delineate the fact that DLQI score predominantly depends on each

individuals perception and ability to cope with the disorder.<sup>13</sup> Hair disorders are known to be associated with a significantly high impact on QoL. The use of DLQI in dermatology shows that the psychological impact of many of the so called benign skin conditions such as alopecia, acne, contact dermatitis is far greater.<sup>15</sup> A study from Thailand also showed the mean DLQI score in patients with systemic sclerosis to be  $6.3 \pm 5.97$ , far lower than the mean DLQI for other skin disorders such as vitiligo (8.8), and urticaria (14.1) evaluated in the same population.<sup>16,17</sup> Discrepancies are quite common between patient's perception of the disease and the physician's interpretation. Thus dermatological disorders though appear seemingly benign, might be associated with profound impairment of the QoL, such as discoid lupus erythematosus (DLE), a relatively benign skin condition has been found to be associated with a higher DLQI scores ( $12.42 \pm 6.24$ ) when compared to systemic lupus erythematosus (SLE) ( $6.5 \pm 6.02$ ).<sup>18</sup> Twenty of 32 patients with positive family history of graying, were seen to blame their parents for the disorder.

Individual questions in the present study revealed that, highest impact of graying was seen on psychology and the felt need of medical intervention. Mood fluctuations as a result of inability to cope with graying and a sense of guilt in terms of not taking adequate care of their hair were recorded to be strongly present among these patients. The ability to concentrate at work and participate at different events are relatively less affected aspects of QoL, probably because graying of hair does not drag one's attention unless commented on. Although many patients 46 complained of embarrassment due to their gray hair and had to tolerate frequent comments from peers and relatives; only a few of these 21 ended up having trouble in relationships with close friends or family members.

As most of the patients were adolescents and conscious of their image, about 72 subjects tried to hide the condition by change in hair style or use of cap or coloring agents. Total of 30 patients feared that the condition is contagious and transmitted by sharing of combs, these patients, coerced by parents, consciously avoided sharing of combs between family members. Such practices produce additional impact in the form of anxiety and guilt in adolescents; by influencing their perception of the disorder as they are at a vulnerable age and already going through a lot of physical and mental changes. The resultant guilt and mood fluctuations can have a long term calamitous effect on ones psychosocial and personality development.

This seemingly run-of-the-mill disorder has profound impact on QoL, especially affecting tender adolescent age group, which makes it indispensable to recognize and give due importance to premature canities in an attempt to correct it or halt the progression. The modified DLQI is an easy and rapid means of evaluation of the impact on

different outlooks of QoL, which can help clinicians for early medical intervention of patients.

### Limitations

Limitations of current study were; the study sample was of small size restricted only to Western Indian patients to extrapolate national trends. Comparative analysis with control group could have added more value to the results. More wholesome assessment requires consideration of socioeconomic strata and education level of parents. The quality of diet and nutritional deficiencies were not evaluated which is a widely prevalent problem in Indian population.

### CONCLUSION

Thus, premature canities, is a common benign disorder, with huge impact on the QoL of the sufferers. The worst affected is the psyche of the patient, such as mood fluctuations and a sense of guilt, depending on the individuals perception of the disorder. Awareness should also be created regarding seeking medical and psychological counselling care early as premature canities has higher incidence during vulnerable adolescent age group.

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