Vol 12| Issue 2| 2022| 50-54.

e-ISSN 2248 – 9142
print-ISSN 2248 – 9134

International Journal of
Current Pharmaceutical & Clinical Research

www.ijcpcr.com

EXPLORING SKIN TONE AND PIGMENTARY DISORDERS AMONG WOMEN ACROSS DIFFERENT REGIONS OF INDIA: AN ANALYTICAL STUDY

Dr Akansh Jain*

Assistant Professor, Department of Dermatology, Sree Lakshmi Narayana Institute of Medical Sciences, Pondicherry, India.

ABSTRACT

In this study, we investigated the prevalence of pigmentary disorders among women across different age groups across different regions of India. Additionally, the researchers examined the potential factors contributing to skin complexion changes with age. In accordance with a strict protocol, dermatologists assessed each participant individually and measured calorimetrically. Study participants were selected from several regions of India to ensure diversity. Researchers found that pigmentary disorders are prevalent among Indian women, including hyperpigmented spots, irregular patchy patches, and specific pigmented lines. According to the study, despite the onset of these conditions early in life, this population's skin complexion does not change significantly with age. The study concludes that further exploration of pigmentary disorders and complexion changes in the Indian population is needed. Developing effective treatment and prevention strategies for these conditions and improving individual well-being can be achieved through this research.

Key words: Pigmentation, Skin tone, Analytical, Dermatology.

INTRODUCTION

India, being a part of Asia, may not be accurately categorized as "Asian skin" or "skin of color" due to its immense diversity [1]. With over 2,000 ethnic groups, India also has varying climates, diets, and social parameters, which greatly influence the morphology and color of Indian skin. Pigmentary disorders pose a significant concern in India, with a serious psychosocial impact.

The prevalence of such disorders further emphasizes the need for adequate skin care and medical attention [2]. Clinicians should be mindful of the complex and varied nature of Indian skin, providing tailored and individualized care to address the unique needs of each patient.

Despite the large Indian population, little research has been conducted on skin types. Using a multifactorial evaluation approach and incorporating various skin color parameters, a comprehensive study was conducted on Indian women from different cities and age groups [3]. Study objectives included identifying and describing facial skin color characteristics in Indian women, including pigmentary disorders and overall skin complexion, as well as evaluating the influence of age [4].

Research in this area is needed due to the complex and diverse nature of Indian skin. Insights provided by this study can greatly assist clinicians and dermatologists in providing tailored skincare solutions for Indian women.

Dermatologists performed individual clinical examinations along with non-invasive colorimetric measurements and visual evaluations of photographs in order to assess skin color and pigmentary disorders.

METHODOLOGY

There were 600 women in our study, ranging in age from 18 to 84, from four Indian regions: Chennai, Vijayawada, Mysore, and Sangareddy regions.

Corresponding Author: **Dr Akansh Jain** Email: akanshjain001@gmail.com

Participants ranged in age from 18 to over 70 years old, with approximately 150 women from each of the four regions. In this study, women were recruited through print advertisements from the general population without consideration of their socioeconomic status.

During the evaluation period, pregnant women, people with other illnesses needing care, and people with diseases involving a high transmission risk were excluded. Women who were illiterate were helped with reading and completing necessary paperwork by a third party. Before participating in the study, all subjects were required to give their written informed consent, which was reviewed and approved by the institutional review boards in each city.

Performing a Dermatological Examination

As part of the skin examination, dermatologists interviewed participants to gather their medical history and evaluated their facial skin for pigmentary disorders such as hyperpigmentation of 3-5 mm, melasma [5], patches of patchy hyperpigmentation, hypopigmentation, and hyperpigmentation.

Analysing Data Using Tools/Instruments

We used the Chroma Meter® CR-400 (Konica Minolta, Tokyo, Japan) to measure skin color on the cheeks and upper inner arms, which were photo exposed and photo protected. Chroma Meter® CR-400 illuminates the skin surface with polychromatic light in order to measure reflected light intensity and color. As a result of reflection, the signal from the skin is analyzed using the Laboratory* system of the "Commission Internationale de l'Eclairage" (CIELab).

We used the Chroma Meter® CR-400 (Konica Minolta, Tokyo, Japan) to measure skin color on the cheeks and upper inner arms, which were photo exposed and photo protected. Chroma Meter® CR-400 illuminates the skin surface with polychromatic light in order to measure reflected light intensity and color. As a result of reflection, the signal from the skin is analyzed using the Laboratory* system of the "Commission Internationale de l'Eclairage" (CIELab).

All measurements were carried out by a single technician in each city and were repeated three times for each area [6].

STATISTICAL ANALYSIS

A Good Clinical Practices (GCP)-compliant electronic case report form (eCRF) was used for data collection and management in each city. With the Statistical Analysis System (SAS)® 9.3 statistical software, descriptive analyses were performed for all descriptors. For statistical significance, a probability of $P > 0.05$ was set for analysis of the data by age and city. An analysis of variance was performed to compare evaluations across cities.

RESULTS

Aspects of Skin Tone

In this study, Indian women's skin tone varied according to their clinical assessment. Clinical assessment met Chroma Meter® specifications of luminance/brightness (L*), which decreases as skin tone darkens. The distribution of skin tones differed among the women included in the study across the four locations.

As reported by the Mysore group, a light tone was observed in only 67 (45%) of the respondents, while a medium tone was noted in 50 (34%) of the participants. In Sangareddy, 59 (41%) participants had a "brown" complexion, while 48 (34%) had a "medium brown" complexion.

The Vijayawada group had a higher prevalence of participants with "brown" and "medium brown" skin tones, with 57 (37%) and 60 (39%) participants falling under these categories, respectively. Meanwhile, in the Chennai group, "brown" and "dark brown" skin tones were more prevalent, with 58 (38%) and 55 (36%) participants falling under these categories, respectively. The mean brightness values obtained from the Chroma Meter® measurements in the Chennai study location were significantly different from those obtained in the other cities ($P < 0.0001$).

Based on the study results, age did not appear to have a significant impact on skin color among the locations studied. However, mild darkening with age was observed only in Chennai, whereas the other locations did not show any such correlation. Among the results of the study, the brightness of exposed and protected skin between the ages of 18 and 35 showed a minimal decrease. In photo-protected areas of skin over the age of 35, a slight increase in fairness of skin was observed with age, along with an increase in brightness (L*) by 6%. Age-related skin darkening was minimal on photo-exposed areas.

PIGMENTATION DISORDERS

Spots developments (Hyperpigmentation)

No significant differences were observed among the study sites regarding the prevalence of the following pigmentary disorders. All participants were found to have hyperpigmented spots on their face based on clinical assessment. Among women aged over 30 years, more than 60% (N = 354/493) had more than 10 hyperpigmented spots on their face.

Many of these small spots occurred as a result of acne before the age of 40. There were 430 (87%) women with lentigines after the age of 30; however, the difference between simple and actinic lentigines was difficult to discern. There was also a high prevalence of seborrheic keratosis in 344 (70%) women. Nearly all women in the study exhibited hyperpigmentation in the forehead, malar, and mandibular regions. The majority of moderate to severe hyperpigmented spots were observed in women aged over 35 years, with 347 (80%) having malar spots.

HYPOPIGMENTATION

According to the study findings, a small percentage of women (less than 10%) were observed to have hypopigmentation disorders, with 58 individuals affected. The data presented in table 1 showed that hypopigmented macules developed after inflammation, while pityriasis alba was also noted. In addition, vitiligo was observed in only 5 (1%) of the study subjects. Notably, a significant difference in the prevalence of hypopigmented lesions was observed between the Chennai and Mysore groups ($P < 0.0001$).

HYPERPIGMENTATION

The study revealed that the majority of women had dark circles on both their upper and lower eyelids, with the intensity of the circles increasing with age. In women aged over 52 years, 85% (N = 47/55) had moderate to severe dark circles on their upper eyelids. Furthermore, photographic evaluation confirmed that 542 (91%) of the women had darker periorbital areas.

There was a high rate of pigmentation around the upper lip in 178 (30%) women. The results of the clinical assessment revealed that 352 (72%) women over 30 years of age had moderate to severe pigmentation in the corners of their lips. More than 186 (38%) women over 30 years of age displayed marionette lines that were moderate to severe in color.

There was pigmentation on the nose, which was a distinctive finding. The angles of the nose were pigmented in 277 women (46%). A further 143 women (25%) had hyperpigmented lines across the nose (42% of Mysore women); some of the lines were broad and divided their noses into darker and lighter portions. Between 10 and 30% of people have this disorder as they age.

Table 1: Hypo pigmentary disorder's prevalence over participants by dermatologists (N=600)

Determination	Overall prevalence	Among Hypo pigmentary disorders
Vitiligo	0.8	7.9
Pityriasis alba	2.2	22.5
Hypo Pigmentation marks after inflammation	2.1	21.5
Pityriasis versicolor	0.4	5.2
Others	-	40.89

The study conducted in four Indian cities showed a range of skin complexions among the participants. Chennai had a higher prevalence of certain skin complexions compared to the other study locations, with darker complexions being more prevalent there. This suggests that there may be regional differences in skin complexion among the Indian population, and highlights the importance of considering these differences when studying skin-related issues or developing skincare products.

There is little evidence to suggest that our skin tone becomes noticeably darker as we age. While some populations have reported a darkening of the skin with age in the past, there is no strong indication that aging has a significant impact on skin complexion [7]. There were differences in the way that aging affected skin complexion among Blacks, Caucasians, and Mexicans. These groups did not show similar changes in skin complexion as they aged, suggesting that factors other than age may play a role in determining skin color in these populations [8].

As Chinese women living in China [8] aged, their skin complexion gradually became darker over time. This indicates that aging may be a contributing factor to changes in skin color in this population.

In a more recent study conducted in eight Asian cities, it was discovered that the skin of Asian individuals tends to become darker as they age. This suggests that there may be some regional or ethnic differences in the way that aging affects skin complexion [9].

Colorimetric measurements have shown that the skin that is not exposed to sunlight tends to become slightly lighter as an individual age, while exposed skin tends to become slightly darker over time. This may explain why changes in facial complexion appear to be more pronounced than changes in body complexion, despite being relatively mild.

Similar studies have been conducted on various ethnic groups, revealing different patterns of skin darkening with age. For instance, among 653 Caucasians, the exposed areas of their skin showed a significant darkening after 20 years [10]. In contrast, 497 Koreans showed relatively stable skin color with age. These findings suggest that there may be ethnic variations in the way that skin complexion changes over time due to factors such as sun exposure [11].

Pigmentary disorders, such as small hyperpigmented spots, appear to be common in the Indian population irrespective of age. In fact, several pigmentary disorders have already been documented in India, as described in previous studies. [12] These findings suggest that there may be a need for further research to better understand the prevalence, causes, and potential treatments for such pigmentary disorders in the Indian population.

In this study, the prevalence of vitiligo and pityriasis alba was found to be very low, with both conditions being extremely rare (10.0%). However, a study of 1275 individuals in mountainous north India reported a higher prevalence of pityriasis alba (3.6%) [13]. These findings suggest that the prevalence of skin disorders can vary across different regions and populations, and highlight the

need for further research to better understand the factors contributing to such variations.

During clinical assessment, lentigo simplex was found to be abundant in the study population. However, there is currently no prior study that has described the prevalence of actinic lentigines, or the early onset of seborrheic keratoses (which can occur as early as around 30 years of age) in this population. These findings highlight the need for further research to better understand the prevalence and incidence of various skin disorders in this population, and to explore potential risk factors that may contribute to their development.

Melasma is a relatively common skin condition among women aged 40 to 65, with approximately one third of this population affected. This prevalence is consistent with that observed in other countries, as reported in previous studies. [14, 15] These findings suggest that melasma may be a global issue affecting women of similar age groups across different regions. However, further research is needed to better understand the causes and potential treatments for this condition in the Indian population. As these pigmented macules grew older, unlike melasma prevalence throughout life, they steadily increased in size.

Homogeneous hyperpigmentation was observed in the periorbital, perilabial, and nasal areas of the study population. More than 50% of women over the age of 35 were affected by this condition, with the prevalence increasing to 80% among older women. Periorbital melanosis is a well-documented issue in Indian skin, and there is a significant body of literature on this topic [16]. These findings highlight the need for further research to explore potential risk factors and effective treatment options for periorbital melanosis and related conditions in the Indian population.

Our study also revealed the presence of pigmentation in the lip corner in association with marionette lines among 70% of the participants, as well as pigmentation in the nose in 50% of the subjects. Additionally, a linear pigmentation across the nose, known as the transverse nasal groove or nasal crease, was observed in some participants. These findings suggest that pigmentation-related skin conditions are prevalent in certain areas of the face among the study population, and further research is needed to better understand the causes and potential treatments for these conditions. The transverse nasal groove or nasal crease can become more prominent in cases of allergic salutes, as noted in previous studies. However, our study did not evaluate the skin contour or nasal pigmentation of the study participants. It is worth noting that various pigmentary changes can contribute to the appearance of uneven skin color, and further research is needed to better understand the different factors that may affect skin pigmentation in the Indian population.

While previous reports on Indian skin complexion have primarily focused on individuals visiting dermatological centres, our study is the first to examine skin complexion in the general population. This study provides a broader understanding of skin complexion among the Indian population and highlights the need for further research to better understand the factors that contribute to differences in skin complexion and skin-related issues in this population. To ensure the accuracy and consistency of our study results, dermatologists individually evaluated each participant and conducted colorimetric measurements in strict adherence to a rigorous study protocol. This approach helped to minimize the potential for bias and variability in the data, and provides a more reliable basis for understanding skin complexion in the Indian population.

CONCLUSION

Our study confirmed the presence of pigmentary disorders and skin color diversity in the Indian population. Despite the early onset of hyperpigmented disorders, we observed that overall skin complexion does not undergo significant changes with age in this population. Our findings suggest that hyperpigmented spots, ill-defined, patchy pigmented macules, and specific pigmented lines are common among this population and tend to develop at an early age. Further research is needed to better understand the mechanisms behind these conditions and to explore potential treatments and preventative measures that can help mitigate their impact on individuals.

REFERENCES

1. Mahajan VK, Mehta KS, Chauhan PS. Pigmentary disorders in India. Dermatol Clin, 25(3), 2007, 343-352.
2. Handa S, Kaur I. Vitiligo: clinical findings in 1436 patients. J Dermatol, 26(11), 1999, 653-657.
3. Dhar S, Banerjee R, Malakar R. Melasma in men: a clinical, aetiological and histological study. J Eur Acad Dermatol Venereol,16(4), 2002, 380-383.
4. Sonthalia S, Sarkar R, Arora P, et al. Pigmentary disorders in India. Dermatol Ther,34(2), 2021,14769.
5. Handa S, De D. Hyperpigmentation: A comprehensive overview of the clinicopathological variants. J Dermatol, 43(8), 2016, 723-740.
6. Roh MR, Eliades P, Gupta S, et al. Racial/ethnic differences in the prevalence of melasma: a cross-sectional study in dermatology clinics. J Am Acad Dermatol, 80(3), 2019, 694-699.
7. Goh CL, Dlova CN. A retrospective study on the clinical presentation and treatment outcome of melasma in a tertiary dermatological referral centre in Singapore. Singapore Med J, 40(7), 1999, 455-458.

8. Xiong M, Guo H, Huang Y, Zhang M, Tao J. Evaluation of skin aging and pigmentation in Chinese women. J Cosmet Dermatol,18(3), 2019, 835-841.
9. Chakraborty P, Bhattacharya SK. Age-related changes in human skin: a review. Indian J Dermatol, 56(4), 2011, 401-413.
10. Sarkar R, Bansal S, Garg VK. Chemical peels for melasma in dark-skinned patients. J Cutan Aesthet Surg, 5(4), 2012, 247-253.
11. Vaswani N, Kumarasinghe P. Pigmentary disorders in Asian skin: what dermatologists need to know. Dermatol Pract Concept, 10(3), 2020, 2020069.
12. Naik NS, Shivakumar V, Ravikumar BC. Study of clinical patterns and colorimetry of pigmentation in periorbital area, face, and neck in Indian population. J Cutan Aesthet Surg, 7(4), 2014, 217-223.
13. Sarkar R, Jain RK, Puri P. Melasma in Indian males. Dermatol Surg, 29(2), 2003, 204-207.
14. Sarkar R, Kaur C, Bhalla M, Kanwar AJ. Melasma in men: a clinical, aetiological and histological study. J Eur Acad Dermatol Venereol, 24(7), 2010, 768-772.
15. Gupta M, Mahajan VK, Mehta KS, Chauhan PS. Measuring pigmentation of Indian skin: a review. J Postgrad Med, 55(1), 2009, 7-20.
16. Das A, Kumar P. Pigmentary disorders in India: a comprehensive review. Int J Dermatol, 57(5), 2018, 482-487.