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A CLINICO-EPIDEMIOLOGICAL STUDY ON THE SPECTRUM OF FACIAL HYPERMELANOSIS IN PATIENTS ATTENDING A TERTIARY CARE HOSPITAL

Dermatology

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ABSTRACT

Background: Facial hypermelanosis encompasses a broad spectrum of pigmentary disorders characterized by brown, black, or blue discoloration of the facial skin. These conditions represent a common cosmetic concern with significant psychological burden, especially in the Indian population.**Methods:** A cross-sectional observational study of 1,232 patients with facial hyperpigmentation was conducted over one year (November 2024–November 2025) at the Dermatology OPD of a tertiary care hospital. Detailed demographic and clinical data were recorded and relevant investigations performed.**Results:** Females predominated (66%) with an overall female-to-male ratio of 1.93:1. The 31–40-year age group was most affected (47%). Melasma was the most common condition (34%), followed by post-inflammatory hyperpigmentation (PIH, 18%), drug-induced hypermelanosis (13%), lichen planus pigmentosus (LPP, 11%), TSDF (8%), periorbital hypermelanosis (6%), ephelides (5%), Riehl's melanosis (3%), and nevus (2%). Sunlight was the predominant aggravating factor for melasma (53%); acne vulgaris was the leading cause of PIH (46%). Drug-induced hypermelanosis was more prevalent in males, primarily due to Clofazimine in leprosy treatment.**Conclusion:** Facial melanoses have diverse etiologies, with melasma being the most common. Accurate etiological diagnosis, photoprotection counselling, and psychosocial support are essential pillars of management.

KEYWORDS

Facial hypermelanosis, melasma, post-inflammatory hyperpigmentation, lichen planus pigmentosus, Riehl's melanosis, drug-induced pigmentation, Indian population

INTRODUCTION

Facial hypermelanosis refers to increased deposition of melanin in the facial skin, manifesting as brown, black, or blue-grey discoloration. It is among the most frequent dermatological complaints in patients with skin of color, particularly in South Asian populations, and carries a substantial cosmetic and psychosocial burden including reduced self-esteem and impaired quality of life.

The pathophysiology of facial pigmentation is multifactorial. Normal skin color is determined by the number, size, and distribution of melanosomes within keratinocytes, as well as stratum corneum thickness, dermal vascularity, and exogenous pigments. Hyperpigmentation may be epidermal—due to increased melanocyte activity—or dermal, as a consequence of melanin dropout into the dermis or mixed.

Contributing factors include hereditary predisposition, endocrine disturbances (e.g., hormonal contraceptive use, thyroid dysfunction), nutritional deficiencies, inflammatory conditions, neoplastic processes, and exposure to chemical or pharmacological agents. Sun exposure and photosensitizing agents play pivotal roles in the development and aggravation of many pigmentary disorders. India's diverse ethnic groups, tropical climate, and high ultraviolet radiation index contribute to a particularly high prevalence of these conditions

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Common facial pigmentary disorders include melasma, post-inflammatory hyperpigmentation (PIH), lichen planus pigmentosus (LPP), Riehl's melanosis, periorbital hypermelanosis, ephelides, solar lentigines, nevus of Ota, and drug-induced pigmentation. Differential diagnosis can be challenging due to overlapping clinical features, and accurate categorization is essential for appropriate management.

Despite the high prevalence of facial hypermelanosis in India, large-scale clinico-epidemiological studies systematically characterizing the entire spectrum remain limited. This study was designed to analyze clinical patterns, assess epidemiological profiles including sex and age distribution, and identify prevalent conditions and their aggravating factors.

AIMS AND OBJECTIVES

Aim

To analyze the clinical patterns of altered facial pigmentation in patients attending the Dermatology Outpatient Department of a tertiary care hospital.

Objectives

- To categorize the different clinical presentations of facial hypermelanosis and identify the most common conditions within this spectrum.
- To determine the prevalence of facial pigmentation disorders across different age groups and genders, and to calculate the female-to-male ratio.
- To identify the aggravating and precipitating factors associated with the common causes of facial hypermelanosis.

MATERIAL AND METHODS

Study Design

Cross-sectional observational study conducted in the outpatient clinic of the Department of Dermatology, Venereology and Leprosy at a tertiary care hospital.

Study Period and Sample Size

November 2024 to November 2025 (one year). A total of 1,232 patients were enrolled.

Inclusion Criteria

- All patients presenting to the Dermatology OPD with facial hyperpigmentation as the chief complaint.
- Patients of all age groups and both sexes.
- Patients willing to provide written informed consent.

Exclusion Criteria

- Patients who refused consent.
- Pregnant and lactating women.

- Patients with primary lesions other than macules and patches over the face.

Data Collection

After obtaining written informed consent, detailed demographic data were recorded. Comprehensive clinical history included age at presentation and onset, disease duration, and family history. Information on predisposing factors—sun exposure, prior inflammatory skin conditions, cosmetic use, oral contraceptive pill use, and drug history—was systematically collected. Relevant investigations (complete blood count, thyroid function tests, hormonal assays) were performed where indicated. Clinical diagnosis was established by a qualified dermatologist based on morphology, distribution, and Wood's lamp findings; histopathology was used in selected uncertain cases.

Statistical Analysis

Data were recorded on a predesigned proforma and entered into Microsoft Excel. Categorical variables are expressed as frequencies and percentages. The female-to-male ratio was calculated for the overall population and for individual diagnoses.

RESULTS

Sex Distribution

A total of 1,232 patients were enrolled. Females constituted 66% (n=813) and males 34% (n=419), yielding an overall female-to-male ratio of 1.93:1 (Figure 1).

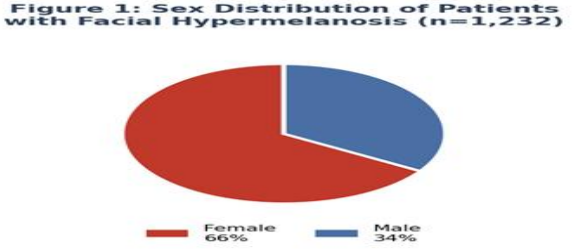


Figure 1:Sex Distribution of Patients with Facial Hypermelanosis (n=1,232)

Age Distribution

The 31–40-year age group was most commonly affected (47%), followed by the 21–30-year group (28%), 41–50 years (8%), 51–60 years (7%), >60 years (6%), and <20 years (4%) (Figure 2).

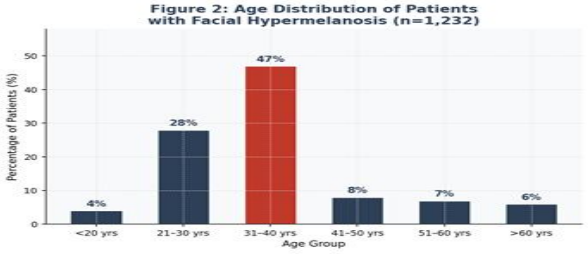


Figure 2: Age Distribution of Patients with Facial Hypermelanosis (n=1,232)

Spectrum of Facial Hypermelanosis

Melasma was the most prevalent condition (34%), followed by PIH (18%), drug-induced hypermelanosis (13%), LPP (11%), TSDF (8%), periorbital hypermelanosis (6%), ephelides (5%), Riehl's melanosis (3%), and nevus (2%) (Figure 3; Table 2).

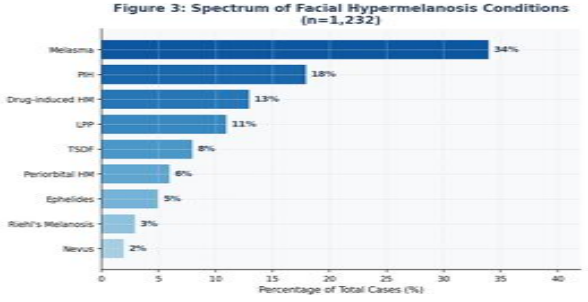


Figure 3: Spectrum of Facial Hypermelanosis Conditions (n=1,232)

Gender Distribution Across Diagnoses

Melasma showed a marked female predominance (females: 342, males: 121). LPP, Riehl's melanosis, ephelides, and periorbital hypermelanosis were also more prevalent in females. Drug-induced hypermelanosis was notably more common in males (males: 132, females: 71) due to Clofazimine use. PIH was nearly equally distributed (Figure 4; Table 3).

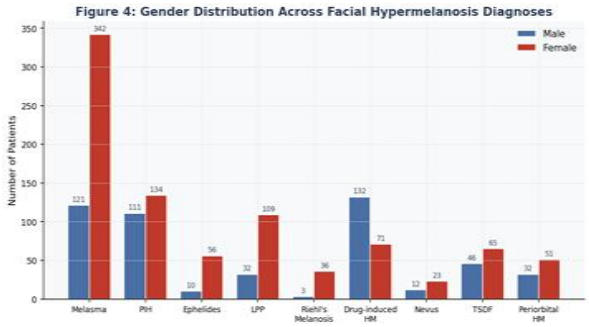
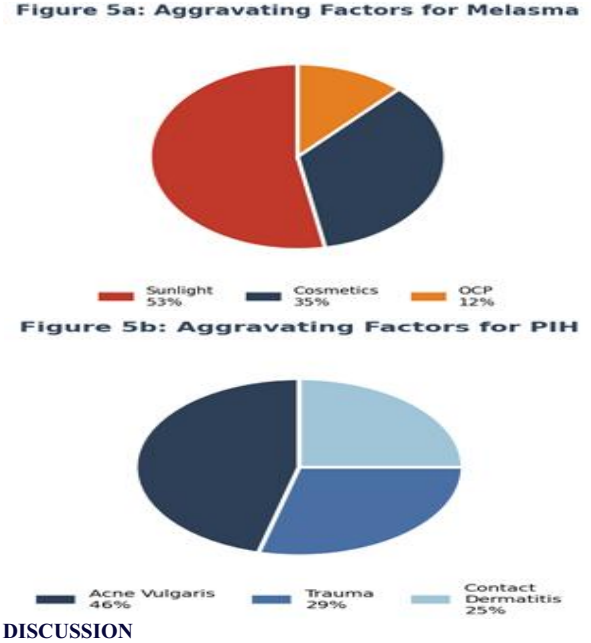


Figure 4: Gender Distribution Across Facial Hypermelanosis Diagnoses

Aggravating Factors

For melasma, sunlight exposure was the leading aggravating factor (53%), followed by cosmetic use (35%) and oral contraceptive pills (12%). For PIH, acne vulgaris was most frequent (46%), followed by trauma (29%) and contact dermatitis (25%). Drug-induced hypermelanosis was most commonly caused by Clofazimine in patients on MDT-MB for leprosy (Figure 5; Table 4).



DISCUSSION

This cross-sectional study assessed the demographic and clinical profile of 1,232 facial melanosis patients at a tertiary care dermatology OPD, providing a comprehensive characterization of the spectrum of facial hypermelanosis in an Indian clinical setting.

Age Distribution

The majority of patients (47%) were aged 31–40 years, with an additional 28% in the 21–30-year group. This indicates that facial hypermelanosis predominantly affects the economically productive and socially active population, amplifying its psychosocial impact. Our findings differ from Kavya et al.[6], who reported the 21–30-year age group as most commonly affected. The higher peak age observed in our study may reflect the cumulative nature of photodamage and the delayed onset of hormonally driven conditions such as melasma.

Gender Distribution

Females constituted 66% of the study population, with an overall female-to-male ratio of 1.93:1. This is consistent with Hassan et al.[5] (ratio 1.92:1), while Achar et al.[1] noted a higher 4:1 ratio. The female predominance is attributable to the hormonal regulation of

melanogenesis—particularly by estrogen and progesterone—and greater societal pressure on women to seek cosmetic treatment.

Spectrum of Conditions

Melasma was the most common facial pigmentary disorder (34%), consistent with Shah et al.[2] and Gupta et al.[3] It presented as symmetrical, well-demarcated hyperpigmented patches over the malar, frontal, and mandibular regions with marked female predominance (female: 342, male: 121), reflecting established hormonal and photosensitivity-related pathogenesis.

PIH was the second most common condition (18%). Post-acne pigmentation was the leading subtype (46%), followed by post-traumatic pigmentation (29%) and contact dermatitis-related pigmentation (25%), consistent with Shah et al.[2] Taylor et al.[4] reported high rates of acne-induced PIH in Asian patients (47.4%), corroborating our findings.

Drug-induced hypermelanosis (13%) was notably more prevalent in males, primarily due to Clofazimine use in MDT-MB for multibacillary leprosy. The reddish-brown to slate-grey pigmentation caused by Clofazimine deposits represents a significant source of stigma among affected patients.

LPP (11%), Riehl's melanosis (3%), periorbital hypermelanosis (6%), ephelides (5%), TSDF (8%), and nevi (2%) constituted the remainder of the spectrum, with Riehl's melanosis and LPP showing marked female predominance, reflecting the role of cosmetic sensitizers and autoimmune/hormonal mechanisms respectively.

Aggravating Factors

Sunlight was identified as the predominant aggravating factor across categories. For melasma, 53% of patients reported sunlight as the key trigger, emphasizing the critical importance of photoprotection. The identification of acne vulgaris as the primary cause of PIH (46%) has important therapeutic implications, underscoring the need for early and effective acne management to prevent post-acne pigmentation in skin of color populations.

Psychosocial Impact

Facial pigmentary disorders carry a disproportionate psychosocial burden, particularly for women. The predominantly female-affected, reproductive-age demographic identified in this study highlights the need for integrated management approaches addressing both the dermatological condition and its psychological sequelae including anxiety, depression, and social withdrawal.

CONCLUSION

This study demonstrates that facial hypermelanosis is a diverse and common dermatological problem in the Indian population, with melasma as the most prevalent condition, followed by PIH, drug-induced hypermelanosis, and LPP. The condition predominantly affects women in the third and fourth decades of life. Sunlight exposure is the most significant and modifiable aggravating factor across multiple categories, reinforcing the paramount importance of photoprotection.

Drug-induced hypermelanosis due to Clofazimine warrants greater clinical attention in leprosy-endemic regions. A thorough clinico-epidemiological approach, tailored to specific etiology, is essential for effective management. Addressing the psychosocial impact of these conditions—especially in women—must form an integral component of patient care. Further multicenter studies with larger sample sizes are warranted to characterize the influence of hormonal, lifestyle, and occupational factors more comprehensively.

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