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# CLINICOPATHOLOGICAL CORRELATION OF HYPERPIGMENTED SKIN LESIONS- A CASE STUDY IN A TERTIARY CARE HOSPITAL.

**Pathology**

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## ABSTRACT

Hyperpigmented skin lesions clinically include a wide spectrum of disorders. Histopathological examination plays a crucial role in accurately diagnosing these lesions by distinguishing between melanocytic and non-melanocytic types, which often have overlapping clinical presentations. This differentiation is essential because some lesions may mimic malignant melanoma clinically but turn out to be benign or inflammatory conditions on histology. Histopathology enables detailed evaluation of tissue morphology, including pigment distribution, cellular atypia, and inflammatory patterns, which guides definitive diagnosis and appropriate management. Accurate diagnosis reassures patients when lesions are benign and ensures timely intervention when malignancy is detected. The underlying causes range from inflammatory disorders such as dermatitis, lichen planus to melanotic disorders like facial melanosis, naevus etc. The objective of our study is to find the correlation between histopathological and clinical diagnosis of hyperpigmented skin lesions. Skin punch biopsy and excision biopsy was done and sent to histopathology department for routine processing. We included 37 cases in our study who were clinically diagnosed with hyperpigmented skin lesions comprising of all age groups. The cases were primarily from the department of dermatology and surgery. **Summary-** Clinical history along with histopathological diagnosis is essential for accurate diagnosis and definite treatment of patients with hyperpigmented skin lesions.

## KEYWORDS

hyperpigmented, lichen planus, melanosis

## INTRODUCTION

Skin pigmentation depends upon the amount of melanin the body generates. The rate of melanin synthesis is regulated by Melanin-concentrating hormone and α-melanocyte stimulating hormone. Melanocytes produce melanin, a natural skin pigment, that is responsible for human coloring of the skin, eyes and hair. In human skin, these cells offer protection against UV rays. The defects in melanocyte function can lead to various skin pigment disorders comprising of benign and malignant entities. The variation in skin color is caused by genetics, sun exposure and certain hormones that stimulates melanocytes.[1]

Pigmented skin lesions can be classified clinically as patch, plaque, macule or papule, which is brown, black or blue colored.[2] Microscopic examination of skin biopsy lesions is the single most important diagnostic technique needed in the diagnosis and further management. The present study has been focused on skin lesions clinically diagnosed with hyperpigmentation and correlated with histopathology.

### Methods:

A cross-sectional study of 2 years was done in the department of Pathology comprising patients of all age groups clinically diagnosed with hyperpigmented lesions from November 2022 to November 2024. A total of 37 cases were clinically diagnosed with hyperpigmented skin lesions. Clinical history like age, duration of lesion, site of lesion and significant medical history was taken. Skin punch biopsy and excision biopsy was done. For histopathology processing, biopsy tissues were routinely fixed in 10% formalin. The sections were stained using Hematoxylin and Eosin. Biopsies were studied and a detailed examination of epidermal and dermal features were done.

**Inclusion Criteria**- All the hyperpigmented lesions of skin including all age groups. Both genders were included in the study.

**Exclusion Criteria**- Inadequate biopsy specimen and skin biopsies other than hyperpigmented lesions were excluded from the study.

## RESULTS

Out of 421 skin biopsies studied during this period, 37 cases were diagnosed as hyperpigmented skin lesions which were divided into inflammatory and benign. Our study did not include any malignant lesion. Among the inflammatory lesions, nevus was the most common lesion, followed by riehl's melanosis, pityriasis rubra pilaris, dermatitis herpetiformis, eczema, discoid lupus erythematosus and lichen planus. Other cases observed were Disseminated superficial actinic porokeratosis and morphea [Table no. 1]. We also noted that 9 cases presented with non-specific findings.

**Table No. 1- Type Of Lesions**

| S.No. | Type of lesions | No. of cases | Percentage |
|---|---|---|---|
| 1. | Nevus | 4 | 10.81 |
| 2. | Riehl's melanosis | 3 | 8.10 |
| 3. | Pityriasis rubra pilaris | 3 | 8.10 |
| 4. | Dermatitis herpetiformis | 2 | 5.40 |
| 5. | Eczema | 2 | 5.40 |
| 6. | Discoid lupus erythematosus | 2 | 5.40 |
| 7. | Lichen planus pemphigoides | 2 | 5.40 |
| 8. | Lichen planopilaris | 2 | 5.40 |
| 9. | Pityriasis lichenoid chronica | 2 | 5.40 |
| 10. | Hypertrophic lichen planus | 1 | 2.70 |
| 11. | Disseminated superficial actinic porokeratosis | 1 | 2.70 |
| 12. | Morphea | 1 | 2.70 |
| 13. | Granulomatous inflammation | 3 | 8.10 |
| 14. | Descriptive | 9 | 24.32 |

Our study showed male preponderance (53%). The most common age group affected was 31-40 years and few cases were noted in children [Table no. 2]. Head and neck was the most common site involved followed by upper extremity [Figure no. 1].

**Table No. 2- Age-wise Distribution.**

| Age in years | Percentage of distribution |
|---|---|
| Birth-10 | 2 |
| 11-20 | 8 |
| 21-30 | 6 |
| 31-40 | 10 |

| | |
|---|---|
| 40-50 | 6 |
| >50 | 5 |

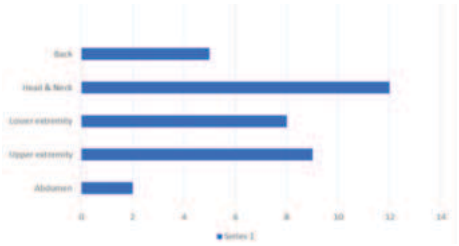


**Figure No. 1**- Site wise distribution of pigmented lesions.

**DISCUSSION:**

The present study emphasizes the significance of clinicopathlogical correlation in the evaluation and management of hyperpigmented skin lesions. Clinical diagnosis of these lesions is often complicated by overlapping morphological features, making it challenging to establish a definitive diagnosis based on clinical examination alone. The incorporation of histopathological analysis through skin biopsy provides a vital tool for accurate characterization and categorization of such lesions, directly impacting management strategies and outcomes.

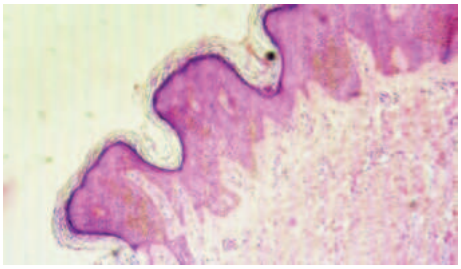

**Figure No. 2**- Epidermal nevus with epidermis showing keratotic follicular plugging and basal hyperpigmented keratinocytes (10 x view, H & E stain).

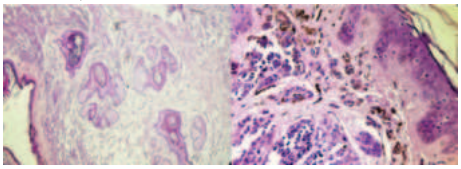

**Figure No.3**- 3a) Follicular cystic sebaceous hamartoma, shows dilated follicles with adjacent mature sebaceous lobules 3b) with intradermal nevus (40 x view, H & E stain).

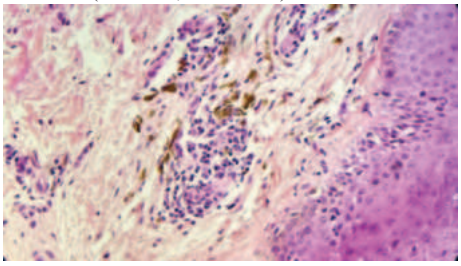

**Figure No.4**- Riehl's melanosis showing basal cell vacuolization and pigment incontinence in dermis (40 x view, H & E stain).

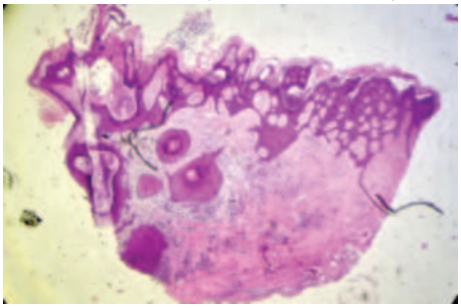

**Figure No.5**- Hypertrophic lichen planus- Epidermis shows acanthoses, hyperkeratosis, papillomatosis and wedge shaped hypergranulosis. Dense lymphohistiocytic inflammatory infiltrate was seen at the base of rete ridges (4 x view, H & E stain).

Pigmented nevus are the most common benign neoplasms affecting the skin. Our study showed cases of nevi (10.81 %) comprising of epidermal nevus [Figure no.2], intradermal nevus and one case of intraepidermal nevus with follicular sebaceous cystic hamartoma [Figure no. 3a and 3b]. Patients mostly presented with macules, papules and showed concordance with the histopathological diagnosis. Study done by Liu et al. showed 90 % concordance between clinical and histological diagnosis in cases of nevi.[3]

Reihl's melanosis typically affects face, neck and upper chest[4], seen mostly in women with history of cosmetic abuse . Study done by Bhairavi. M also showed female predominance.[5] Correlation between clinical and histopathological findings was strong, notably with dermal pigment incontinence and increased epidermal melanocytes, consistent with prior studies of Reihl's melanosis. [Figure no.4].

Cases of pityriasis rubra pilaris presented clinically as erythematous plaques on the back, neck, and arms. Histopathological findings in the present study were concordant with clinical diagnosis, in agreement with features reported by Karaosmanoglu N et al. done on 70 patients showing primarily the presence of erythematous scaly plaques.[6]

For dermatitis herpetiformis patients exhibited multiple itchy, excoriated lesions over both arms and legs. Histopathology showed ruptured subepidermal blisters with a mixed inflammatory infiltrate, including collection of polymorphonuclear cells, few lymphocytes and bacterial colonies in accordance with clinical expectations and previous reports by Nguyen CN et al. [7]

Lichen planus was frequently encountered, mainly as hyperpigmented macular lesions over the face and neck, as well as in forms such as lichen planus pemphigoides, lichen planopilaris, and hypertrophic lichen planus [Figure no.5]. On histopathology, these displayed wedge-shaped hypergranulosis, orthokeratosis, dense lympho-histiocytic infiltrate and pigment incontinence; the high clinico-histological concordance further established lichen planus as a leading hyperpigmented lesion, as observed in a case study by Rajendra PJ et al.[2]

Discoid lupus erythematosus (DLE) was seen in a middle aged male, at postauricular region as erythematous scaly plaque with pigmentation. Histology revealed interface dermatitis with degeneration of basal layer aligning with previous findings found a series of patients with DLE by Adithyan P.[8]

Pigmented lesions such as pityriasis lichenoid chronica presented as multiple hyperpigmented macules and papules which on histology revealed hyperkeratosis, liquefactive degeneration of basal layer and exocytosis. Basal cell vacuolation and exocytosis was also seen as a major histological finding by Nair PS. in a case study done on 39 patients with pityriasis lichenoid chronica.[9]

Clinically patients with eczema showed crusted hyperpigmented plaques over face, lower back and right arm. On histology, spongiosis, exocytosis of inflammatory cells and perivascular lymphohistiocytic infiltrate in the dermis were the main findings found in our cases (5.40 %).

Lesions such as disseminated superficial actinic porokeratosis and morphea demonstrated clinicopathological concordance, reinforcing the utility of biopsy for confirmation in ambiguous cases.

Despite this high degree of concordance (67.5 % in the present study), discordance between clinical and histopathological diagnosis was observed in a minority of cases, including some instances of dermatitis herpetiformis, nevus, and lichen planus. Among hyperpigmented cases, granulomatous inflammation was identified in 8.1% and non –specific findings in 24.32% of biopsies, emphasizing the diagnostic complexity and heterogeneity of these disorders.

Overall, the study demonstrates that while clinical recognition of hyperpigmented lesions is generally reliable, histopathological examination remains indispensable for definitive diagnosis and optimal patient management, especially in cases with unusual presentations or overlapping features. These findings underscore the value of an integrated clinicopathological approach in dermatology.

**Limitations-**

Limitations of the study include its single-center design, modest

sample size and lack of patient follow-up, which may constrain the generalizability and assessment of long-term outcomes.

## CONCLUSION

Our study highlighted that hyperpigmented skin lesions encompass a wide spectrum of conditions affecting all age groups, with predominance in middle aged adults and a slight male preponderance. Nevi emerged as the most common lesion. Histopathological examination played an essential role for confirming clinical diagnosis for accurate differentiation between different lesions. The clinicopathological correlation was high with concordance. Thus, clinical assessment along with histopathological evaluation is necessary for precise diagnosis and accurate management.

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