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Histomorphological spectrum of pigmented skin lesion in Tertiary care centre

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Abstract

Introduction: Pigmentary disorders are a common reason for dermatologic consultations in India, significantly impacting psychological well-being. These conditions vary due to factors like age, sex, systemic disorders, and economic status. While many are benign, some require medical intervention. Clinical evaluation usually suffices, but diagnostic procedures and histopathological analysis are crucial for accurate diagnosis and treatment.

Materials and Methodology: This study aimed to characterize the histopathological spectrum of pigmented skin lesions at a tertiary care hospital in Gujarat, India. Conducted over one year from January to December 2023, it involved a prospective observational design with 60 participants. Skin biopsies from patients of all ages, collected at the Department of Skin and Venereal diseases, were examined. Biopsy samples were processed and stained with hematoxylin and eosin for histological evaluation. The inclusion criteria encompassed all pigmented skin lesions, while inadequate samples and non-pigmented lesions were excluded.

Results: Results showed a diverse demographic with the majority of participants (38.33%) aged 21-40 years and a male predominance (65%). Pigmented lesions were most commonly located on extremities (30%) and face (28.33%). The most frequent clinical diagnoses included nevi (21.66%), basal cell carcinoma (15%), and verruca vulgaris (11.66%). Histopathological findings revealed melanocytic nevi as the most common diagnosis (21.66%), followed by verruca vulgaris (13.33%) and pigmented basal cell carcinoma (10%).

Conclusion: The study highlights the critical role of histopathological examination in diagnosing and managing pigmented skin lesions, demonstrating a significant clinicopathological correlation (73.33%). It emphasizes the need for thorough clinical and pathological collaboration to optimize patient care.

Keywords: Basal cell carcinoma, Melanocytic nevi, Pigmented skin lesion

Introduction

Pigmentary issues are a common reason for seeking dermatologic advice. In India, they pose a significant worry with a strong psychological effect on life quality ^[1]. Dermatological issues are frequently seen in every country and cover a broad range ^[2]. It differs depending on the country and different areas within a country ^[3]. Age, Sex, systemic disorders, economy, literacy, race, and social customs also influence this variation ^[3].

The most frequent health issues in India are related to skin problems ^[2]. It is found in 6.3-11.16% of cases ^[4]. However, the majority of them are not considered to be a major issue, as it is assumed that most are harmless and not dangerous to life ^[5]. Nevertheless, certain conditions necessitate significant medical intervention and have a significant psychological effect on quality of life ^[6]. A large number of skin lesions are diagnosed through clinical evaluation of the lesion's history and examination. Nevertheless, a few of them need basic diagnostic procedures for more information to reach a final diagnosis. A few examples include preparing potassium hydroxide for displaying fungal elements, Tzanck smear, using a wood's lamp for examination, and conducting a skin biopsy ^[7]. Different skin biopsy methods include punch biopsy, shave biopsy, scalpel biopsy, and curettage biopsy ^[7]. Skin biopsy and histopathological analysis are necessary for precise diagnosis, identifying the causative agent using specific stains when possible, and aiding clinicians in determining the best course of treatment ^[5, 8]. However, only a small number of studies have been conducted in western India, specifically in Gujarat, that detail the diseases needing histopathological examination to verify the clinical diagnosis.

Therefore, the current study aimed to characterize the histopathological spectrum of skin lesions in a tertiary care hospital.

Materials and Methodology

This one-year hospital-based prospective observational study was carried out in collaboration between the Department of Pathology and the Department of Skin and Venereal diseases at Medical College and Hospital, Ahmedabad, Gujarat, India from January 2023 to December 2023. Once written consent was obtained, skin biopsies were conducted on patients of all ages who visited the Department of Skin and Venereal diseases, including all cases seen during the study period. A sample size of 60 cases was chosen for the study.

The biopsy sample collected from skin lesions that were diagnosed clinically were promptly dispatched to the histology laboratory in 10% formalin. Medical background and pertinent information were documented. The specimen was placed in 10% neutral buffered formalin for a duration of 12 to 24 hours. Paraffin wax blocks were created and thin sections measuring 3-4 micrometres were stained with H&E stain for histological examination under a microscope. The necessary demographic information was collected from the requisition form that was included with the specimens.

Inclusion criteria

All the neoplastic and non-neoplastic pigmented lesions of the skin from all age groups and both genders were included in the study.

Exclusion criteria

Inadequate biopsy specimen and skin biopsies other than pigmented lesions were excluded from the study.

Results

In present study duration, total 60 participants were enrolled as per study inclusion and exclusion criteria.

Table 1: Demographic data of study participant

Age (Years)	Gender		Total Participant N (%)
	Male n (%)	Female n (%)	
0-20	3 (5%)	3 (5%)	6 (10%)
21-40	17 (28.33%)	6 (10%)	23 (38.33%)
41-60	14 (23.33%)	7 (11.67%)	21 (35%)
61-80	5 (8.33%)	5 (8.33%)	10 (16.67%)
>80	0	0	0
Total	39 (65%)	21 (35%)	60 (100%)

Data were expressed as n (%).

Table 1 presented the demographic characteristics of the study participants, categorized by age and gender. The age groups were divided into five categories: 0-20 years, 21-40 years, 41-60 years, 61-80 years, and over 80 years. For each age group, the number and percentage of male and female participants were provided, along with the total number and percentage of participants in that age group. Specifically, the 0-20 years age group consisted of 6 participants (10%), with an equal distribution of 3 males (5%) and 3 females (5%). The 21-40 years age group had 23 participants (38.33%), including 17 males (28.33%) and 6 females (10%). In the 41-60 years age group, there were 21 participants (35%), with 14 males (23.33%) and 7 females (11.67%). The 61-80 years age group included 10 participants (16.67%), with an equal distribution of 5 males (8.33%) and 5 females

(8.33%). Notably, there were no participants in the over 80 year's age group.

Table 2: Site of pigmented lesion

Site	Frequency n (%)
Extremities	18 (30%)
Face	17 (28.33%)
Genitalia	5 (8.34%)
Scalp	3 (5%)
Trunk	17 (28.33%)

Data were expressed as N (%)

Table 2 delineated the distribution of pigmented lesions across various anatomical sites among the study participants. The data were categorized by frequency and percentage. The extremities were the most common site, with 18 lesions (30%). Lesions on the face and trunk were equally prevalent, each accounting for 17 cases (28.33%). The genitalia had 5 lesions (8.34%), while the scalp had the fewest lesions, with 3 cases (5%). This distribution highlights the varied anatomical localization of pigmented lesions observed in the study population.

Table 3: Clinical Diagnosis

Clinical Diagnosis	Frequency N (%)
Nevus	13(21.66%)
Basal Cell Carcinoma	09(15%)
Squamous cell Carcinoma	02(3.33%)
Seborrheic keratosis	05 (8.33%)
Verruca vulgaris	07(11.66%)
Pigmented Folliculitis	02(3.33%)
Bowen's Disease	02(3.33%)
Prurigo nodularis	02(3.33%)
Lichen planus	03(5%)
Lichen planus Actinicus	01(1.67%)
Ashy Dermatitis	01(1.67%)
Acrochordon	03(5%)
Erythema annular centrifugum	01 (1.67%)
Follicular Hyperkeratotic Papule	01 (1.67%)
Cutaneous Horn	01(1.67%)
Wart	01(1.67%)
Dermatofibroma	01(1.67%)
Dermatitis Herpatiformis	01(1.67%)
Dermatosis Papulosa Nigra	01(1.67%)
Spider angioma	02(3.33%)
Urticarial vasculitis	01(1.67%)

Data were expressed as n (%).

Table 3 provided a comprehensive overview of the clinical diagnoses observed among the study participants, enumerating both the frequency and percentage of each condition. The most prevalent diagnosis was Nevus, with 13 cases (21.66%). Basal cell carcinoma, Verruca vulgaris and seborrheic keratosis are accounted for 09(15%), 07(11.66) and 05 (8.33%) respectively. Several diagnoses, including Acrochordon, Lichen Planus, Prurigo nodular is, Squamous cell carcinoma, Bowen's disease, Pigmented folliculitis and Spider angioma had fewer instances, ranging from 2 to 3 cases (3.33% to 5%). Numerous conditions were observed only once (1.67% each), reflecting a wide array of less common diagnoses. These included Ashy Dermatitis, Actinic Lichen Planus, cutaneous horn, Wart, Dermatofibroma, Dermatitis papulosa nigra, Dermatitis herpetiformis, Erythema annular centrifugum, Follicular hyperkeratotic papule, Urticarial vasculitis. This diverse distribution underscored the variety of dermatological conditions encountered in the study.

Table 4: Histopathological diagnosis of the pigmented skin lesions

Histopathological Diagnosis	Frequency N (%)
Melanocytic Nevus	13(21.66%)
Pigmented Basal Cell Carcinoma	06(10%)
Trichoepithelioma	02 (3.33%)
Squamous cell Carcinoma	02(3.33%)
Spiradenoma	01 (1.67%)
Seborrheic keratosis	03 (5%)
Keratoacanthoma	01(1.67%)
Verruca vulgaris	08(13.33%)
Psoriasis vulgaris	01(1.67%)
Pigmented Folliculitis	03(5%)
Bowen’s Disease	03(5%)
Prurigo nodularis	02(3.33%)
Lichen planus	01(1.67%)
Lichen planus Actinicus	01(1.67%)
Lichen planus Pigmentosus	01(1.67%)
Lichen simplex Chronicus	01(1.67%)
Ashy Dermatitis	01(1.67%)
Squamous Papilloma	03(5%)
Darrier’s Disease	01(1.67%)
Erythema annular centrifugum	01 (1.67%)
Follicular Hyperkeratotic Papule	01 (1.67%)
Cutaneous Horn	01(1.67%)
Haemangioma	02 (3.33%)
Urticarial vasculitis	01 (1.67%)

Data were expressed as n (%).

Table 4 provided a thorough breakdown of the histopathological diagnoses for the pigmented skin lesions seen in the participants of the study, outlining the frequency and percentage of each condition. The most common lesion diagnosed was Melanocytic Nevus, accounting for 21.66% of cases with a total of 13. In 8 (13.33%) cases, Verruca Vulgaris was found, while Pigmented Basal cell carcinoma identified in 6 (10%) cases. Seborrheic keratosis, Pigmented folliculitis, Bowen’s disease and squamous papilloma represented 3 cases each, making up 5% of the total cases. In 2 (3.33%) cases each, various conditions like Squamous

cell carcinoma, Trichoepithelioma, Prurigo nodularis, and Hemangioma were identified. Various conditions were seen in only one case (1.67%), including Lichen planus, Lichen planus Actinicus, Lichen planus pigmentosum, Lichen simplex chronicus, Ashy dermatitis, spiradenoma, Darrier’s disease, Cutaneous horn, Erythema annular centrifugum, Follicular hyperkeratotic papule, keratoacanthoma, Psoriasis vulgaris, and urticarial vasculitis. This distribution emphasized the varied histopathological makeup of pigmented skin lesions in the study group.

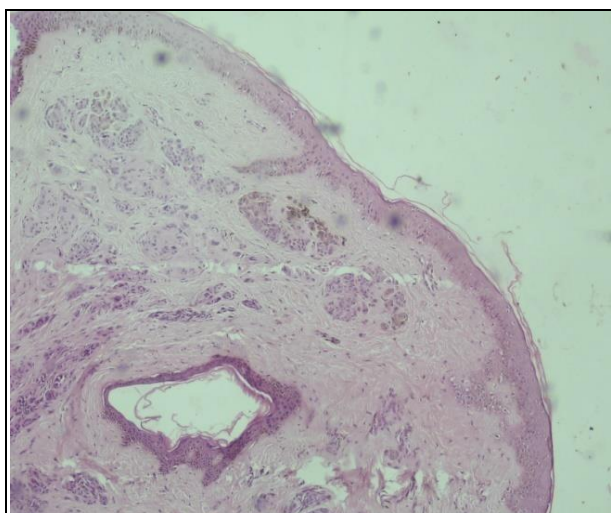


Fig 1: Melanocytic Nevus (H & E)

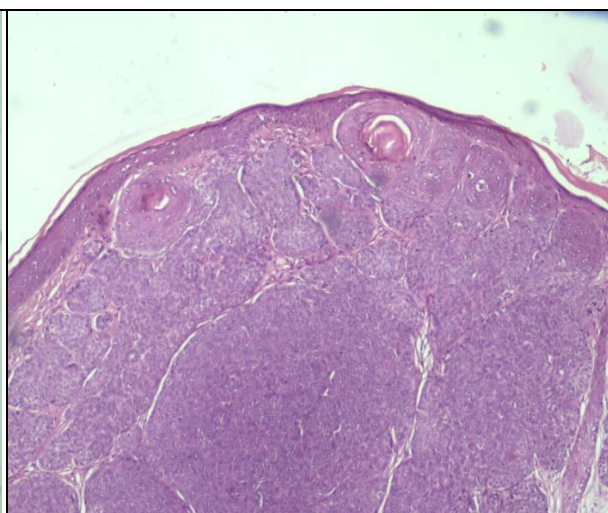


Fig 2: Squamous cell carcinoma (H & E)

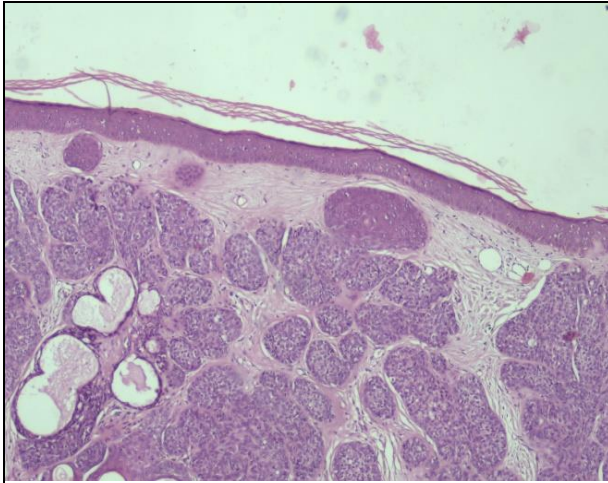


Fig 3: Trichoepithelioma (H & E)

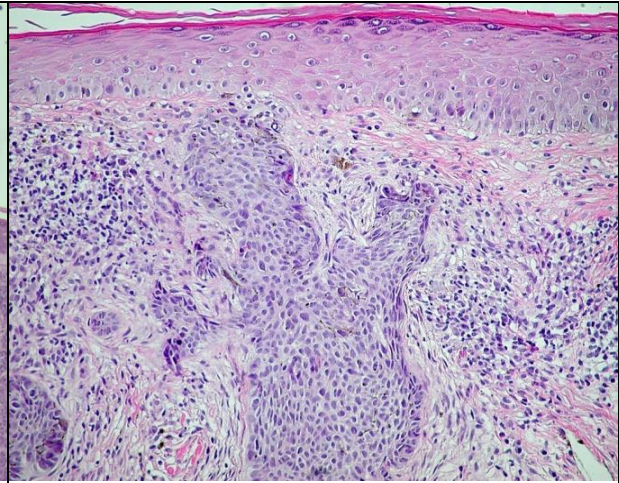


Fig 4: Basal cell carcinoma (H & E)

Discussion

Disruptions in homeostasis lead to skin abnormalities like wrinkles, hair loss, rashes, blisters, and potentially deadly cancers. Not every skin lesion may necessitate a biopsy, but dermatologists often perform one for accurate diagnosis and identification of underlying causes [9]. The incidence of skin conditions can differ based on factors such as economy, education level, climate variations, healthcare access, industrialization, and religious and cultural differences [10]. Skin abnormalities vary widely in appearance and underlying causes. Histopathological evaluation is the most reliable method for diagnosing skin abnormalities. Nevertheless, it is crucial to have a thorough clinical history, a detailed examination of the skin biopsy, and a correlation between clinical and pathological findings in order to accurately diagnose and provide suitable treatment [11]. Additional special stains may be needed alongside histopathological examination to determine the final cause of the disease [11]. A skin biopsy is a straightforward procedure done outside of a hospital setting, which aids in confirming the clinical diagnosis [12].

This study primarily aimed to analyze the histomorphological spectrum of skin lesions, identify the etiology of skin lesions utilizing stains such as Hematoxyline and Eosin stain and assess the prevalence of different causes of skin lesions based on age. A biopsy sample is expected to provide a relatively accurate indication of the various skin conditions that are present. This study included individuals ranging from 9 to 75 years of age. The study involved individuals ranging from their 1st to 7th decades, consistent with previous research by Chandrakanta *et al.*, Mamatha K *et al.*, Singh S *et al.*, Agarwal D *et al.*, Narang S *et al.*, and Kafle SU *et al.* [3, 13-17]. However, a group of researchers including Ayesha N, Mehar R, Yalla ASD, George VP, Deepthi KN, Gaikwad SL, Bharadwaj V, Sushma C, Gupta P, Gulia SP, Bezbaruah R, Baruah M, and Adhikari RC identified patients aged from the first to the eighth decade of life, whereas Adhikari RC *et al.* observed patients ranging from the first to ninth decade of life [4, 18, 10, 12, 19-26].

Male patients had a higher occurrence of pigmented skin lesions at 65%, while female patients had a lower occurrence at 35%, resulting in a M: F ratio of 1.85:1, similar to a previous study [2-4, 8, 18-20, 22-24, 26-29]. Although the results did not match with the studies conducted by Bohra I *et al.*, Abhishek Singh *et al.*, Suvernakar *et al.*, Laishram R

et al., Leung K *et al.*, Mamatha K *et al.*, Kafle SU *et al.*, and Gulia SP *et al.*, which reported a higher number of females [14, 17, 25, 30-34]. The higher occurrence in females in these studies is linked to differences in behavior between male and female patients when it comes to seeking medical assistance.

The findings of our study showed that skin lesions on extremities were prevalent, consistent with previous studies done by Goyal *et al.* [35], Chalise S *et al.* [9], Gorva A *et al.* [36], while Bezbaruah R and Baruah M, (57.52% cases) [26], Bharadwaj V *et al.*, (33% cases) [12]; and Adhikari RC *et al.*, (30.2% cases) [10] who also reported high percentages of cases head and neck regions. This might be a result of the geographic variations in the location of the study.

The most frequent clinical diagnosis in the current research is Nevus (21.66%), then followed by Basal cell carcinoma (15%), Verruca Vulgaris (11.66%) and Seborrheic keratosis (8.33%). Our research show Nevus being most frequently observed in studies by Laishram *et al.* [30], Dowerah *et al.* [37], and Goyal *et al.* [7], with higher incidence rates of 74.4%, 60%, and 25.6% respectively.

The most frequent histological finding in the current study is Melanocytic Nevus (21.66%) followed by Verruca vulgaris (13.33%) and Pigmented Basal cell carcinoma (10%).

Bohra *et al.* [31] found that nevi were most commonly found on the face, which aligns with the results of this study. Melanocytic nevi are harmless growths of melanocytes that can be junctional, compound, or intradermal types [39], whereas Epidermal cyst was the most prevalent lesion in studies conducted by Deepthi KN *et al.* (2020) [22], Bhardwaj V *et al.* (2020) [38], Bezbaruah R and Baruah M (2018) [26]. All the wounds were limited to the head and neck area, mirroring findings from another research study [39]. In the current research, Pigmented Basal cell carcinoma (BCC) was the most commonly seen form of malignancy, accounting for 6 cases (10%), in line with findings from Adhikari *et al.* [10] and other studies conducted on Asian and Caucasian populations [39]. BCC is the most common type of skin cancer that typically develops in sun-exposed areas because of UV radiation, which causes DNA mutations and ultimately leads to the formation of tumors [32]. BCC occurred in individuals aged between their 60s and 70s, with a higher percentage of females affected, similar to findings in a study conducted by Abhishek Singh *et al.* [32]. In study done by Leishram *et al.* [30] and Prasad *et al.* [40] BCC was the most common tumour.

Seborrheic keratosis was present in 5% of cases in the current study, compared to 6%, 7.6%, and 13% in studies conducted by Laishram *et al.* [30], Ranabhat *et al.* [39], and Dowerah *et al.* [37], respectively. Ashy dermatosis (AD), lichen planus pigmentosus (LPP), and lichen simplex chronicus accounted for 5 (8.33%) cases of lichenoid tissue reactions. In these situations, interface dermatitis commonly causes melanin loss from basal cells, which are then consumed by melanophages, leading to pigmentary lesions [16]. Ashy dermatosis (AD) and lichen planus pigmentosus (LPP) are both types of macular pigmentation with unknown causes, commonly seen in individuals with skin types III-IV [39]. Clinicopathological agreement was observed in 44 (73.33%) cases in present study. Dowerah *et al.* [37], Ranabhat S *et al.* [39], and Mruthyunjayappa *et al.* [6] found clinicopathological agreement in 44%, 55% and 95% of cases, respectively. Collaboration between pathologists and clinicians can impact not just the diagnosis, but also patient treatment [39].

This study was conducted at a hospital. Thus, the outcomes could potentially does not represent the entire population. There were only a small number of cases of malignancy. Greater sample size could result in improved outcomes.

Conclusion

Skin pigmented lesions are a common reason for dermatological consultations, and they can arise from melanocytic, keratinocytic, vascular, and reactive sources. Despite being the most frequent pigmented lesions, melanocytic nevi can rarely be malignant and resemble benign tumours. Therefore, histopathological examination continues to be the most reliable method for diagnosing these conditions and helping to guide the patient's treatment effectively. It distinguishes between melanocytic and nonmelanocytic tumours, as well as aiding in their subtyping and grading, relating to growths in the body.

Conflict of Interest

Not available

Financial Support

Not available

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