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To Study the Clinicopathological Correlation of Common Pigmentary Disorders of Skin

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Abstract: ***Objective: To Study The Clinicopathological Correlation of Common Pigmentary Disorders Of Skin. Materials and methods: A study of 50 patients was conducted to study the histopathological findings in pigmentary disorders of skin along with their clinicopathological correlation. Results: In our study major causes of pigmentary disorders were Post inflammatory hyperpigmentation (22%), Lichen planus pigmentosis (16%), Macular amyloidosis (10%), Lichen amyloidosis (8%), Seborrheic keratosis (8%), Epidermal nevus (6%), etc. In our study, the histopathological features of pigmentary disorders were perivascular inflammatory infiltrate in 72% patients, pigment incontinence in 62% patients, elongation of rete ridges in 30 % patients, acellular pinkish material and increase basal pigmentation in 18% patients, pappilomatosis, horn cysts and pseudocysts in 8% patients, nests of melanocytes in 6% patients, melanocyte proliferation in 4% patients and ectatic blood vessels in 2% patients. Conclusion: Clinicopathological concordance was seen in 60% of cases.***

Keywords: Pigmentary disorders, Post inflammatory hyperpigmentation, Lichen planus pigmentosis

1. Introduction

Pigmentary problems are one of the most frequent causes for dermatologic consultation. In India, they are a major concern with great psychological impact on quality of life[1]. Hyperpigmentation is an abnormal darkening of the skin, which typically results from increased melanin. This may occur in the epidermis, dermis, or mixed depending on the site of abnormality[2]. Hyperpigmentary skin disorders comprise a group of diseases of extreme heterogeneity of epidermal and dermal hyperpigmentation subdivided into various types according to etiology, underlying pathology, and the nature of the pigment[1].

A simple way to approach hyperpigmentation is to consider whether the increase in colour is caused by an increase of melanin, an increase in melanocytes, or the deposition of another substance that adds colour to the skin[3].

The microscopic examination of skin tissue is probably the single most important diagnostic ancillary technique used by dermatologists in the management of patients with skin disorders.

In order to render an accurate histopathologic diagnosis, skin biopsies must contain adequate specimen to include the three basic components of the skin, i.e. epidermis, dermis and subcutaneous tissue. Pathologic examination of the biopsied specimen often serves as a complementary or confirmative part of the diagnosis[4].

The aim was study the spectrum of pigmented skin lesions, both melanocytic and non-melanocytic with their clinicopathological correlation.

2. Material and Methods

The study was conducted in the Department of Pathology, Government Medical College, Amritsar after approval from the institutional thesis and ethics committee. 50 cases were included after taking consent of the patient. From each patient included in the study, a skin biopsy was taken. Detailed history and clinical examination of each patient was recorded. In histopathology, biopsy tissue was prepared for light microscopic examination after fixation in 10% formalin. The sections were cut and stained using routine hematoxylin and eosin stain.

3. Results

The cases showed maximum incidence in the age group of 21-30 yrs comprising 14(28%) of cases followed by age groups 31-40 yrs comprising 13(26%) cases. The youngest patient in the study was 15yrs old while the eldest being 70 yrs old.

Table 1: Showing Age Wise Distribution

Age Group	*No. Of Cases*	*Percentage(%)*
11-20 yrs	6	12
21-30 yrs	14	28
31-40 yrs	13	26
41-50 yrs	9	18
>50 yrs	8	16
Total	50	100

Females outnumbered males (52% and 48% respectively) with male to female ratio of 1:1.1.

Table 2: Showing Sex Distribution

Sex	*No. of Cases*	*Percentage (%)*
Male	24	48
Female	26	52
Total	50	100

70% of cases were from urban area while 30% belonged to rural area.

Table 3: Showing Rural/Urban Distribution

Status	*No. of Cases*	*Percentage (%)*
Rural	15	30
Urban	35	70
Total	50	100

Most common site of biopsy was face constituting 14(28%) of cases followed by lower limb constituting 8(16%) of cases.

Table 4: Showing Site of Biopsy

Site	*No. of Cases*	*Percentage (%)*
Face	14	28
Neck	7	14
Chest	5	10
Abdomen	2	04
Back	7	14
Upper limb	7	14
Lower limb	8	16
Total	50	100

Maximum number of patients had presented with clinical diagnosis of lichen planus pigmentosis (13 cases) followed by macular amyloidosis (6cases). Other diagnosis was as shown in table below:

Table 5: Showing Clinical Diagnosis for the Skin Diseases

Clinical Diagnosis	*No. of Cases*	*Percentage(%)*
Post Inflammatory dermatosis	2	4
Lichen Planus Pigmentosis	13	26
Intradermal Nevus	3	6
Seborrheic Keratosis	2	4
Macular Amyloidosis	6	12
Lichen Amyloidosis	4	8
Epidermal Nevus	5	10
Beckers Nevus	2	4
Dermatofibroma	1	2
Pigmented Basal cell carcinoma	1	2
Keratoacanthoma	1	2
Nevus of Ota	2	4
Lichen planus	2	4
Actinic lichen planus	2	4
Impending erythroderma	1	2
Compound nevus	1	2
Cherry angioma	1	2
Parapsoriasis	1	2
Total	50	100

Out of 50 skin biopsies taken, on histopathology 11 were typified as post inflammatory hyperpigmentation, 8 as lichen planus pigmentosis, 5 as macular amyloidosis. Other diagnosis was as shown in table below:

Table 6: Showing Spectrum of Histological Diagnosis of the Skin Biopsies

Histological Diagnosis	*No. of Cases*	*Percentage (%)*
Post Inflammatory dermatosis	11	22
Lichen Planus Pigmentosis	8	16
Intradermal Nevus	3	6
Lentiginous Nevus	2	4
Seborrheic Keratosis	4	8
Macular Amyloidosis	5	10
Lichen Amyloidosis	4	8
Lentigenes	1	2
Epidermal Nevus	3	6
Beckers Nevus	2	4
Dermatofibroma	2	4
Drug Reaction	2	4
Angiokeratoma	1	2
Nevus of Ota	1	2
Melasma	1	2
Total	50	100

Pigment incontinence was the common finding in all diagnosed cases of Post inflammatory hyperpigmentation. Pigment incontinence was also seen in all cases of Lichen planus pigmentosus, Macular amyloidosis, Lichen amyloidosis,Drug reaction and in one case of Lentigenous nevus. Other histopathological findings were as shown in table below

Table 7: Showing Frequency of Various Histopathological Findings in Skin Biopsies

Histopathological findings	*BN*	*SK*	*LPP*	*PID*	*IN*	*EN*	*MA*	*LA*	*M*	*AK*	*LN*	*L*	*DR*
Pigment incontinence	---	---	8	11	---	---	5	4	---	---	1	---	2
Elongation of rete rigdes	2	1	---	---	---	1	5	3	---	---	1	1	1
Perivascular inflammatory infiltrate	1	---	7	11	---	3	4	4	1	---	2	1	2
Acellular pinkish material in papillary dermis	---	---	---	---	---	---	5	4	---	---	---	---	---
Horn cysts and pseudohorn cysts	---	4	---	---	---	---	---	---	---	---	---	---	---
Increased basal pigmentation	2	---	---	---	2	3	---	---	1	---	---	1	---
Melanocyte proliferation	---	---	---	---	---	---	---	---	---	---	2	---	---
Pappillomatosis	---	1	---	---	---	3	---	---	---	---	---	---	---
Nests of melanocytes in upper dermis	---	---	---	---	3	---	---	---	---	---	---	---	---
Ectatic blood vessels	---	---	---	---	---	---	---	---	---	1	---	---	---

In our study, the histopathological findings in case of Post inflammatory hyperpigmentation were melanin deposits both in free form and within melanophages located in upper dermis. Perivascular inflammatory infiltrate consisting mainly of lymphocytes.

Figure 1: Hyperpigmented Lesion on Face in Post Inflammatory Hyperpigmentation

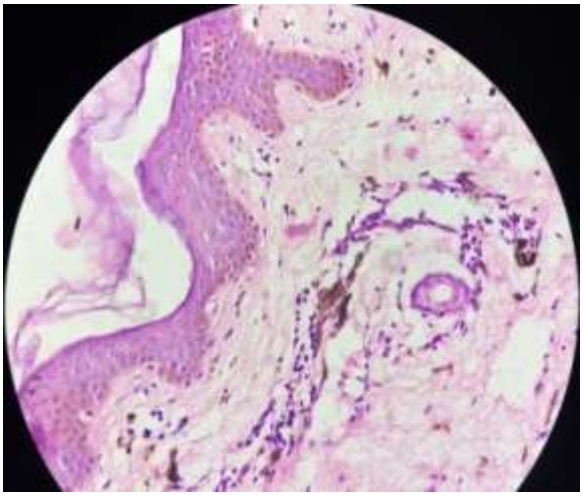

Figure 2: Photomicrograph Showing Pigment Incontinence in Upper Dermis (Post Inflammatory Hyperpigmentation, H & E, 400x)

Histopathological findings in most cases of Lichen planus pigmentosis were thinned out epidermis, dense melanin pigment lying freely and within melanophages and mild perivascular lymphocytic infiltrate.

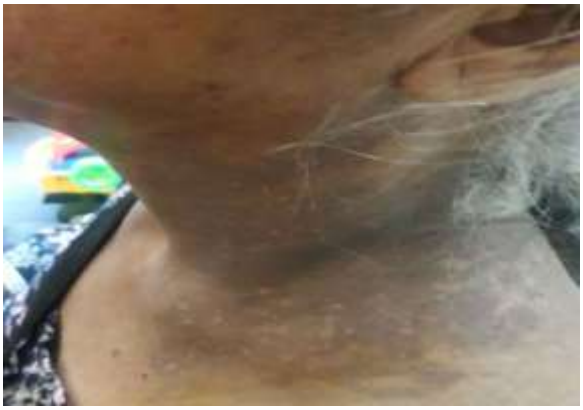

Figure 3: Hyperpigmented Lesion on Neck in Lichen Planus Pigmentosus

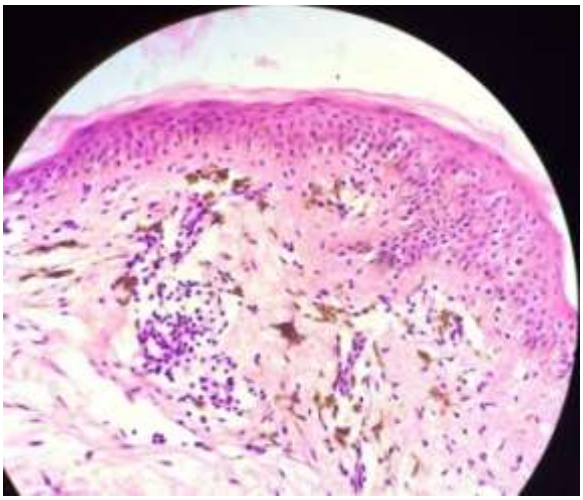

Figure 4: Photomicrograph Showing Loss of Rete Ridges, Vacuolization of Basal Cells, Pigment Incontinence in Upper Dermis (Lichen Planus Pigmentosus, H & E, 400x)

Cases of Macular amyloidosis on histopathology revealed hyperkeratosis, acanthosis with elongation of rete ridges. There was deposition of pinkish amorphous material in papillary dermis along with pigment incontinence and mild perivascular inflammatory infiltrate.

Figure 5: Hyperpigmented Lesion On Back In Macular Amyloidosis

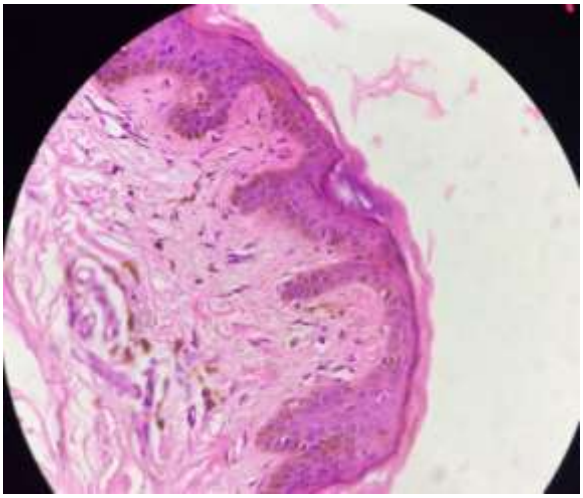

Figure 6: Photomicrograph Showing Elongation of Rete Ridges, Pigment Incontinence, Pinkish Acellular Material In Upper Dermis (Macular Amyloidosis, H & E, 400x)

Histopathology in cases of intradermal nevus revealed small nests of melanocytes in upper dermis along with increased basal pigmentation.

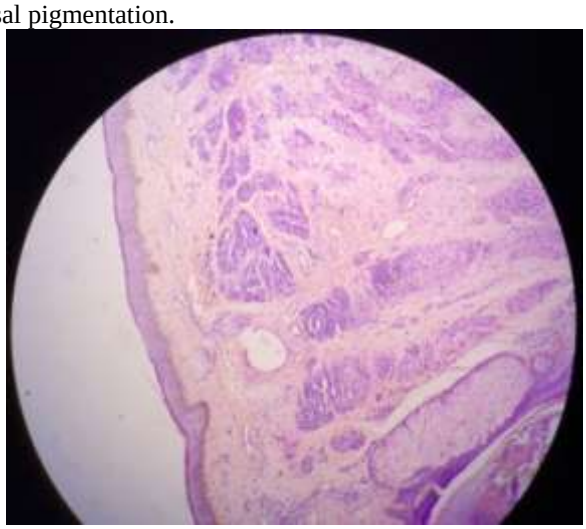

Figure 7: Low Power View Showing Increased Basal Pigmentation and Nests of Melanocytes in Upper Dermis (Intradermal Nevus, H & E, 100x)

Hyperkeratosis, acanthosis, papillomatosis, multiple horn cysts and pseudohorn cyst was seen in cases of Seborrheic keratosis.

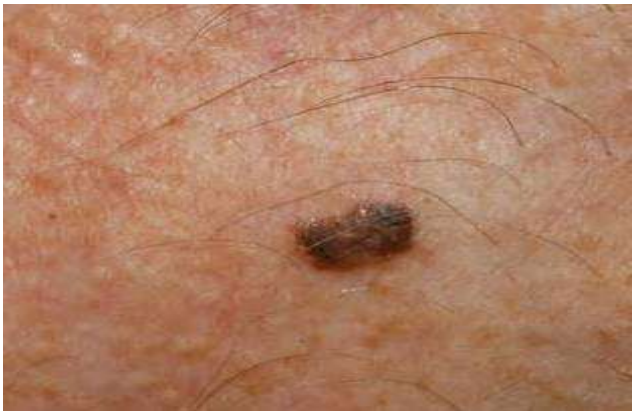

Figure 8: Well Demarcated Hyperpigmented Plaque in Seborrheic Keratosis

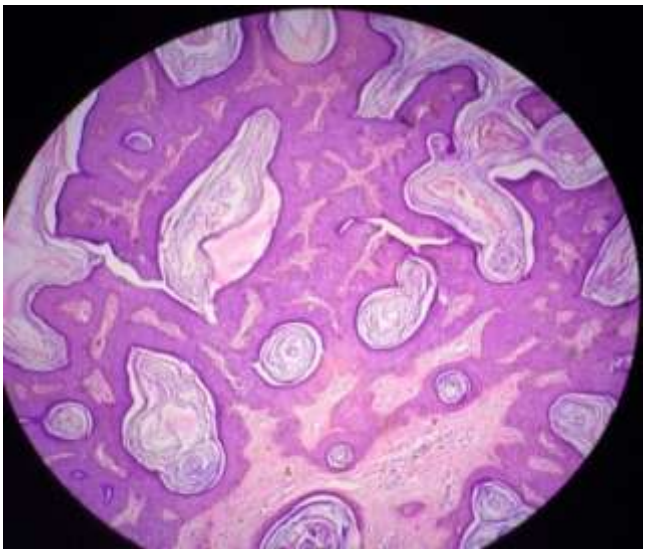

Figure 9: Photomicrograph Showing Multiple Horn Cysts (Seborrheic Keratosis, H & E, 400x)

Three cases diagnosed as Becker's nevus revealed hyperkeratosis, acanthosis, elongation of rete ridges, increased basal pigmentation, and mild perivascular lymphocytic infiltrate.

Histopathology in cases of Dermatofibroma revealed proliferation of spindle shaped fibroblasts in a storiform pattern along with lymphocytic infiltrate. Clinicopathological concordance was seen in 60% cases.

4. Discussion

In our study, majority of the patients of pigmented disorders were in age group 21-30 yrs (28%). Females outnumbered males with a ratio of 1:1.1. Majority of cases 35 (70%) belonged to the urban areas. In our study, maximum number of cases of pigmentary disorders were due to Post inflammatory hyperpigmentation (22%), followed by Lichen planus pigmentosis (16%), Macular amyloidosis (10%), Seborrheic keratosis and Lichen amyloidosis (8% each), Epidermal nevus and Intradermal nevus (6% each), Becker's nevus, Dermatofibroma, Drug reaction, Lentigenous nevus (4% each) and Angiokeratoma, Nevus of ota, Melasma and Lentigines (2% each).

The commonest histopathological features of Pigmentary disorders were perivascular inflammatory infiltrate in 72% patients, pigment incontinence in 62% patients, elongation of rete ridges in 30% patients, acellular pinkish material and increase basal pigmentation in 18% patients, pappilomatosis, horn cysts and pseudocysts in 8% patients, nests of melanocytes in 6% patients, melanocyte proliferation in 4% patients and ectatic blood vessels in 2% patients.

In 2014, Cestari et al studied the histopathological findings in cases of Post inflammatory hyperpigmentation were melanin deposits both in free form and within the melanophages located in the upper dermis and around the blood vessels[5].

In a study by Bhutani et al in 1974, characterstic histopathological findings in cases of Lichen planus pigmentosis were flat epidermis, loss of rete ridges, vacuolisation of basal cells, prominent pigment incontinence within melanophages in upper dermis, mild to moderate perivascular lymphocytic infiltrate[6].

In a study conducted by Anitha B et al in 2012 on Lichen amyloidosis observed various histopathological findings like hyperkeratosis, acanthosis, papillomatosis with downward proliferation of rete ridges. In papillary dermis, there was deposition of pink, homogenous masses[7].

5. Conclusion

Histopathological examination should be carried out in all cases of clinically diagnosed pigmented disease to arrive at a definitive diagnosis. There is no independent gold standard test for the definite diagnosis of pigmented diseases of skin. Taking any of the clinical signs, clinical types, histopathological parameters or histopathological type singly as a gold standard is not ideal.
There is significant overlap in histopathological picture of different pigmented disorders. Thus, morphology alone is seldom not specific and can't be used as a diagnostic tool for identification of specific diseases. Adequate clinical data and workup in combination with pathological resources can help in elucidation of specific etiology and good clinicopathological correlation.

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