

Study of Histopathological Features of Hyperpigmented Lesions of Skin

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Conflict of interest: Nil

Abstract

Introduction: In the present study, 75 cases of Hyperpigmented Skin Lesions were evaluated for clinico-histopathological features, out of which, 37 cases (49.33%) were male and 38 cases (50.67%) were females with male to female ratio of 1:1.03. Age of the patients ranges from 11 years to 82 years with most common age group being 21 to 40 years constituted 32 cases (42.67%), followed by age group of 41-60 years constituted 26 cases (34.67%). Least common age group ranges from 80 years onwards constituted only 1 case (1.33%). The mean age of the patients is 36.15 years and standard deviation (SD) is 36.15 ± 3.53 (at 95% confidence interval). Among 63 cases of non-neoplastic lesions, the histopathological diagnoses of 45 cases are found consistent with clinical diagnosis, whereas 10 cases of neoplastic lesions showing consistency in clinical and histopathological diagnosis among total 12 cases neoplastic lesions.

Material & Method: The Present study was carried out in the Department of Pathology, Pt. J.N.M. Medical College & associated Dr. B. R. A. M. Hospital, Raipur (C.G.). Approval from the Institutional Scientific and Ethical Committees was obtained.

Result: In our study, total 75 cases were studied and we found slight female preponderance with male to female ratio of 1:1.03. Similar results of female preponderance were found on the studies done by S. Mrityunjayappa et al (2016)⁴ with male to female ratio of 1:1.22, Shilpa M Shetty et al (2019)⁶ with male to female ratio of 1:1.91, Rajesh Singh Laishram et al (2013)⁹ with male to female ratio of 1:2.21, M. Parvathi et al (2017)¹¹ with male to female ratio of 1:2.39 and study of Isha Bohra et al (2019)¹⁷ with male to female ratio of 1:1.09. Study done by Ishant Anand et al (2020)¹⁰ shows male to female ratio of 1:1, which was not concordant with the present study.

Conclusion: Histopathology is a helpful tool in reaching a conclusive diagnosis when a patient seeks medical attention for skin lesions, especially in those with non-classical clinical presentation. Without histopathologic analysis of skin samples, there may occasionally be insufficient evidence for an accurate diagnosis. Clinico-pathologic association is known to be necessary for the histological diagnosis of inflammatory and other skin diseases, and as the disease advances, skin lesions change into different phases. A pathologic examination frequently complements or confirms the diagnosis.

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Introduction

At almost 15% of total body weight, skin is the biggest organ in the body. The skin's primary purpose is to protect the body from environmental threats by covering the body, supporting the immune system, and providing UV protection through its pigments [1].

The hue of human skin varies greatly and is influenced by multiple genes. Atypical migration of melanocytes from the neural crest to the skin during embryogenesis, poor transfer of melanocytes to keratinocytes, and changes in melanin synthesis are the causes of pigmentation disorders. A variety of variables, including UV

radiation, tanning, photoaging, medicines, chemicals, hormonal influence, inflammation, and more, can result in abnormalities in the dermis or epidermis, which can lead to hyperpigmentation [1]. Melanocyte proliferation involves the growth of three related cell types: melanocytes, melanoma cells, and nevus cells. These cell types can be found in the dermis, epidermis, or occasionally subcutaneous tissue. Melanocytic nevi are benign neoplasms of nevus cells, while malignant melanoma refers to malignant tumours. Skin lesions that are not melanocytic may be keratinocytic, vascular, or reactive. These include

dermatofibrosarcoma protuberance, lichen planus pigmentosus, actinic keratosis, seborrhoeic keratosis, basal cell cancer, and vasoformative lesions [4].

Because melanocytic and non-melanocytic hyperpigmented lesions have similar clinical characteristics and modes of presentation, diagnosing hyperpigmented skin lesions can be challenging. Therefore, the histology-based treatment principles may be useful in developing a standardised treatment algorithm for these lesions[3]. Skin hyperpigmentation is a significant and prevalent dermatological condition in Asia. About 1.5–3% of people worldwide suffer from psoriasis, a widespread, recurrent inflammatory disease that causes severe morbidity. The Indian population is most frequently affected with lichen planus. Although less frequent, melanocytic lesions such as malignant melanoma account for almost 60% of cancer-related deaths.

Both Asians and Caucasians who have developed benign nevi are at risk for cutaneous melanoma. Asians are increasingly developing pigmented basal cell cancer due to UV exposure. Since acquired hyperpigmented skin lesions are challenging to diagnose clinically, they should receive more attention in India. People in Chhattisgarh, one of the country's tropical regions, are more likely to be exposed to sunshine and perspire, which puts their skin at risk for hyperpigmentation [1]. To accurately diagnose hyperpigmented skin lesions, a thorough histological study is required. Thus, the purpose of this study was to determine the range of hyperpigmented skin lesions in Chhattisgarh based on factors such as age, sex, lesion site, and histological diagnosis.

Material and Methods

The "Study of Histopathological Features of Hyperpigmented Lesions of Skin," was conducted in the pathology department of Pt. J.N.M. Medical College and its affiliated Dr. B. R. A. M. Hospital in Raipur (C.G.) The Institutional Scientific and Ethical Committees gave their approval.

Study Design: Observational, descriptive, cross-sectional study.

Study Setting: Department of Pathology, Pt. J.N.M. Medical College & Dr. B.R.A.M. Hospital, Raipur, Chhattisgarh.

Duration of Study: 2 years i.e. from June 2022 to May 2024.

Study Population: All the biopsies from the hyperpigmented lesions of skin in all age groups, which were received at Histopathology laboratory of Department of Pathology, Pt. J.N.M. Medical College & Dr. B.R.A.M. Hospital, Raipur, and Chhattisgarh.

Inclusion Criteria: Biopsies of hyperpigmented lesions of skin of all age group and both sexes.

Exclusion Criteria: Inadequate and poorly preserved biopsy specimens were excluded from the study.

Sample Collection: Data for the study were obtained from punch biopsies, wedge biopsies and surgically excised specimens of hyperpigmented lesions of skin, which were received in the Department of Pathology, Pt. J.N.M. Medical College Raipur, over a period of 2 years from June 2022 to May 2024.

Details of patients with hyperpigmented skin lesions were retrieved from the archives of the Department of Pathology. The slides were reviewed and analysed. Histopathological findings were correlated with clinical features mentioned on the histopathology examination requisition form.

Result

The current study is being carried out for two years in the Department of Pathology at Pt. J.N.M. Medical College and Dr. B.R.A.M. Hospital in Raipur (C.G.). Biopsies from 75 cases of hyperpigmented skin lesions reported in the skin department of Dr. B.R.A.M. Hospital Raipur (C.G.) were included in the study. The histological characteristics of each biopsy specimen from these instances were examined under a microscope.

Table 1: Age Group Wise Distribution of Hyperpigmented Skin Lesions:

Age group	Non-neoplastic Lesions				Neoplastic Lesions		Total
	Inflammatory	Infective	Metabolic	Genetic & Others	Benign	Malignant	
Birth-20 years	8	2	-	1	2	-	13
21-40 years	24	2	1	3	2	1	33
41-60 years	14	1	4	-	3	2	24
61-80 years	3	-	-	-	1	-	4
81 years onwards	-	-	-	-	-	1	1
Total (n=75)	49	5	5	4	8	4	75

Among total 49 patients of inflammatory hyperpigmented skin lesions, most common age group affected ranges

from 21-40 years constituting 49% (total 24 cases), followed by 41-60 years constituting 28.6% (total 14 cases), followed by birth to 20 years age group constituting 16.3% (total 8 cases), followed by 61-80 years constituting 6.1% (total 3 cases) and least common in 81 years onwards constituting no cases.

Table 2: Distribution of Non-Neoplastic and Neoplastic Lesions on The Basis of Underlying Pathology:

Lesions Categories	Subcategories	Number of cases (n=75)	Percentage (%)
Non-neoplastic cases) (63)	Inflammatory	49	65.33 %
	Infective	5	6.67 %
	Metabolic	5	6.67 %
	Genetic & others	4	5.33 %
Neoplastic (12 cases)	Benign	8	10.67 %
	Malignant	4	5.33 %
Total		75	100

Table 3: Sex Group Wise Distribution of Hyperpigmented Skin Lesions

Sex	Non-neoplastic Lesions(n=63)				Neoplastic Lesions (n=12)		Total
	Inflammatory	Infective	Metabolic	Genetic & Others	Benign	Malignant	
Male	25	4	1	2	3	2	37
Female	24	1	4	2	5	2	38
Total	49	5	5	4	8	4	75

Table 4: Anatomical Distribution of Hyperpigmented Skin Lesions:

Anatomical site	Non-neoplastic Lesions	Neoplastic Lesions	Total
Head & Neck	11	8	19 (25.33%)
Upper Limbs	26	2	28 (37.33%)
Chest & Abdomen	6	-	6 (8%)
Back and waist	7	1	8 (10.67%)
Lower Limbs	9	1	10 (13.33%)
All over body	4	-	4 (5.33%)
Total (n=75)	63	12	75 (100%)

Table 5: Spectrum Of Hyperpigmented Skin Lesions:

	Pathological Diagnosis	Number of cases	Percentage
Non-neoplastic Hyperpigmented Skin Lesions			
Inflammatory:	Lichen Planus Pigmentosus	8	10.67
	Lichenplanopilaris	3	4
	Lichen simplex chronicus	3	4
	Hypertrophic Lichen Planus	1	1.33
	Lichen sclerosus atrophicus	1	1.33
	Atrophic lichen planus	1	1.33
	Classical Lichen Planus	4	5.33
	Lichenoid dermatitis	1	1.33
	Erythema multiforme	1	1.33
	SLE	3	4
	DLE	5	6.67
	Post inflammatory hyperpigmentation	1	1.33
	Morphea	2	2.67
	Dermatosis	1	1.33
	Vasculitis	5	6.67
	Photodermatitis & Poikiloderma	4	5.33
	Dermatitis of pellagra	1	1.33
	Chronic & interphase dermatitis	3	4
	Lichenoid drug eruption	1	1.33
Infective	Pityriasislichenoid chronica & PLEVA	2	2.67
	Pityriasis rosea	3	4

Metabolic	Amyloidosis	4	5.33
	Porphyria cutanea tarda	1	1.33
Others	Dyschromatosis universalis	1	1.33
	Atrophoderma	1	1.33
	Darier disease	1	1.33
	Confluent reticulated papillomatosis	1	1.33
Neoplastic Lesions			
Benign	Beckers nevus	2	2.67
	Epidermal nevus	1	1.33
	Nevus of ota	1	1.33
	Dermal nevus	1	1.33
	Compound nevus	1	1.33
	Actinic keratosis	1	1.33
	Seborrheic keratosis	1	1.33
Malignant	Malignant melanoma	1	1.33
	BCC	3	4
Total		N=75	100%

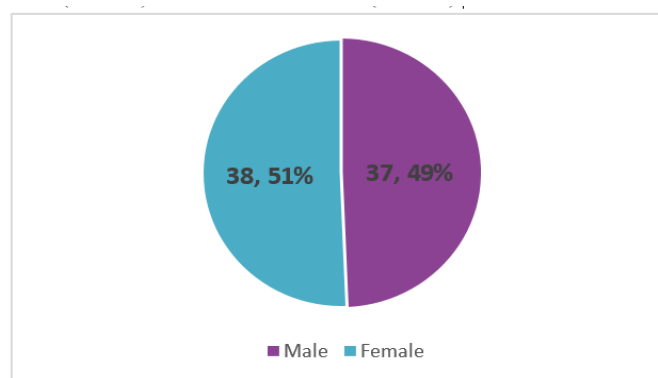


Chart 1: Gender Wise Distribution of Hyperpigmented Skin Lesions:

Out of total 75 cases, 37 cases (49.33%) are male and 38 cases (50.67%) are females. The ratio of male to female is 1:1.03, as given above in chart no. 01.

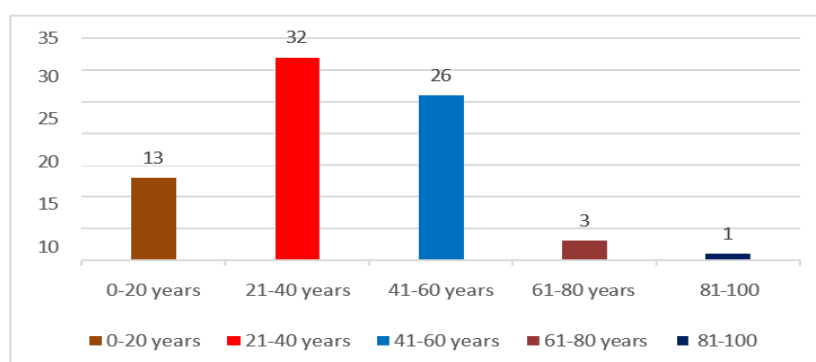


Chart 2: Age Wise Distribution of Hyperpigmented Skin Lesions:

Most common age group affected ranges from 21 to 40 years constituted 32 cases (42.67%), followed by age group 41-60 years constituted 26 cases (34.67%), followed by age group of birth to 20 years constituted 13 cases (17.33%) and age group

of 61-80 years constituted 3 cases (4%). Least common age group ranges from 80 years onwards constituted only 1 case (1.33%). The mean age is found 36.15 years with standard deviation (SD) of 36.15 ± 3.53 (at 95% confidence interval).

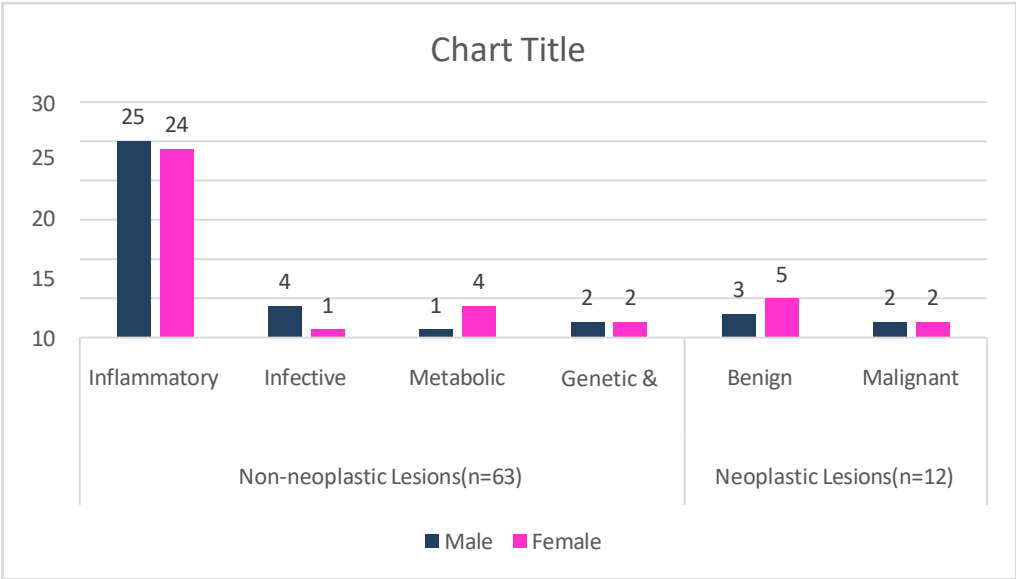


Chart 3: Distribution of Hyperpigmented Skin Lesions On The Basis Of Type of Lesion:

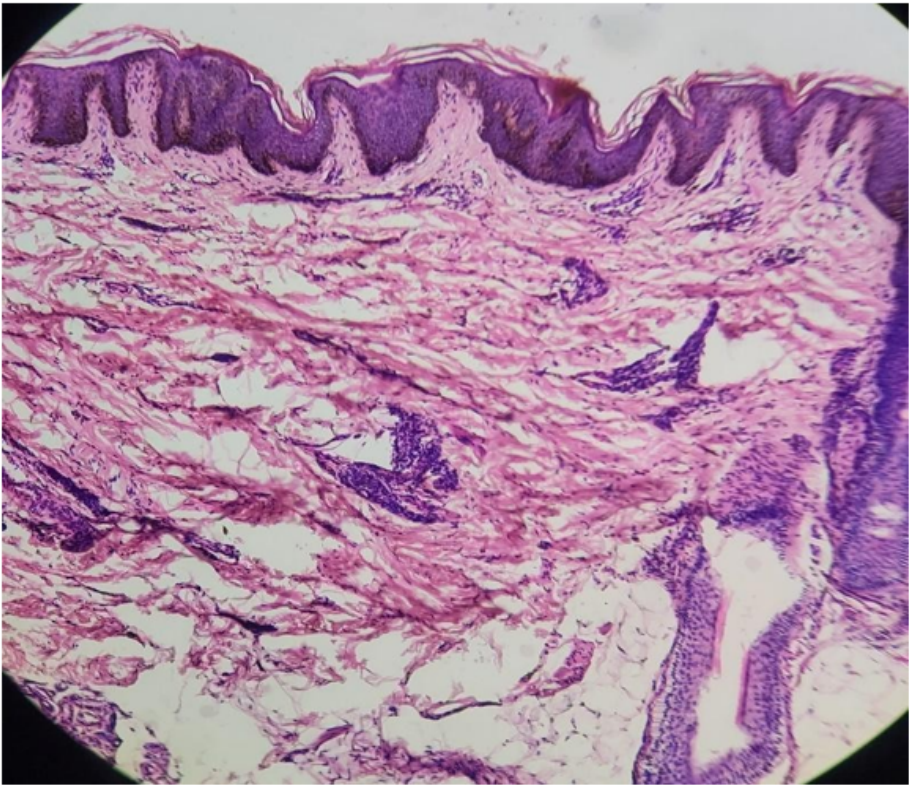


Figure 1: Lichen Planus Pigmentosus (10x, H&E)

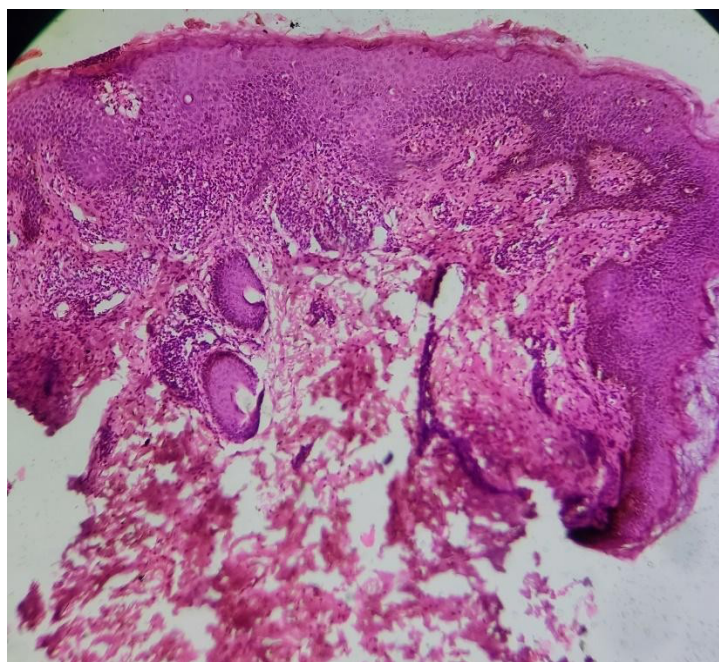


Figure 2: Photodermatitis (10x, H&E)



Figure 3: Becker's Nevus (40x, H&E)

Discussion

The current investigation was carried out over a two-year period in the Department of Pathology at Pt. J.N.M. Medical College and Dr. B.R.A.M. Hospital, Raipur (C.G.).

Seventy-five examples of hyperpigmented skin lesions from the histopathology lab were included in the study. These instances' biopsy specimens were all microscopically inspected for histological characteristics. In our study, total 75 cases were studied and we found slight female preponderance

with male to female ratio of 1:1.03. Similar results of female preponderance were found on the studies done by S. Mrityunjayappa et al (2016) [4] with male to female ratio of 1:1.22, Shilpa M Shetty et al (2019) [6] with male to female ratio of 1:1.91, Rajesh Singh Laishram et al (2013) [9] with male to female ratio of 1:2.21, M. Parvathi et al (2017) [11] with male to female ratio of 1:2.39 and study of Isha Bohra et al (2019) [17] with male to female ratio of 1:1.09. Study done by Ishant Anand et al (2020) [10] shows male to female ratio of 1:1, which was not concordant with the present study.

Table 6: Comparison of Commonest Age Group in Various Studies with Present Study

Study	Most common age group
Shilpa M Shetty et al (2019) [6]	21-40 years
Rajendra Prasad J. et al (2020) [7]	21-40 years
Rajesh Singh Laishram et al(2013) [9]	21-40 years
M. Parvathi et al (2017) [11]	21-40 years
Sneha Ravindran et al (2020) [12]	21-40 years
P R D Ganesh Basina et al (2019) [14]	41-60 years
Isha Bohra et al (2019) [17]	20-40 years
Suvernakar SV et al (2014) [19]	61-80 years
Present Study	21-40 years

In the present study, age of the patients ranged from 11 years to 82 years with mean age observed of 36.15 years with standard deviation of ± 3.53 (at 95% confidence interval). Out of total 75 cases, most (42.67%) cases were in 21-40 years age group. This is in concordance with the studies done by Shilpa M Shetty et al (2019) [6], Rajendra Prasad J. et al (2020) [7], Rajesh Singh Laishram

(2013) [9], M. Parvathi et al (2017) [11] and study by Sneha Ravindran et al (2020) [12], all showed peak incidence of cases in 21-40 years age group. Studies done by P R D Ganesh Basina et al (2019) [14] and Suvernakar SV et al (2014) [19] showed peak incidence of 41-60 years and 61-80 years age group respectively, which were not in concordance with the present study.

Table 7: Comparison of Frequency of Non-Neoplastic and Neoplastic Hyperpigmented Skin Lesions in Various Studies with Present Study

Study	Non-Noeplastic	Neoplastic
S S Jaykar et al (2016) [5]	87.06%	12.94%
Shilpa M Shetty et al (2019) [6]	34.31%	65.69%
Rajendra Prasad J. et al (2020) [7]	34.10%	65.90%
Abhishek Singh et al (2020) [8]	17.33%	82.67%
Ishant Anand et al (2020) [10]	42.86%	57.14%
P R D Ganesh Basina et al (2019) [14]	71.43%	28.57%
S. K. Abdullah Ahmed et al (2021) [16]	33.33%	66.67%
Present Study	84%	16%

In the present study, non-neoplastic lesions were more common constituting 84% (63 cases) than neoplastic lesion constituting 16% (12 cases). This is in concordance with the findings of study done by S S Jaykar et al (2016) [5] with 87.06% non-neoplastic lesions and 12.94% neoplastic lesions. Similar result was also found on the study done by P R D Ganesh Basina et al (2019) [14] who reported 71.43% non-neoplastic lesions and 28.57% neoplastic lesion. Studies done by Shilpa M Shetty et al (2019) [6], Rajendra Prasad J. et al (2020) [7], Abhishek Singh et al (2020) [8] and S. K. Abdullah Ahmed et al (2021) [16] found neoplastic lesions more common than non-neoplastic lesions, which is not in concordance with the present study.

Table 8: Comparison of Clinical and Histopathological Correlation in Various Studies with Present Study

Study	Histopathological diagnosis	
	Consistent with clinical diagnosis	Inconsistent with clinical diagnosis
S. Mrityunjayappa et al (2016) [4]	95%	5%
S S Jaykar et al (2016) [5]	78.90%	21.10%
Rajendra Prasad J. et al (2020) [7]	85%	15%
Abhishek Singh et al (2020) [8]	73.33%	26.67%
M. Parvathi et al (2017) [11]	72.73%	27.27%
Sneha Ravindran et al (2020) [12]	90%	10%
B Pavan Kumar et al (2022) [13]	66.67%	33.33%
P R D Ganesh Basina et al (2019) [14]	81%	19%
Rakesh Saha et al (2020) [15]	84%	16%
S. K. Abdullah Ahmed et al (2021) [16]	54%	46%
Isha Bohra et al (2019) [17]	56.50%	43.50%
Present Study	73.33%	26.67%

Present study revealed 73.33% (total 55) cases with positive correlation and 26.67% (total 20) cases with no correlation between clinical and histopathological diagnosis.

Clinical and histopathological diagnosis were consistent in 70 to 80% cases in studies conducted by S S Jaykar et al (2016) [5], Abhishek Singh et al (2020) [8] and M. Parvathi et al (2017) [11], which is in concordance with the present study. Studies conducted by S. Mrityunjayappa et al (2016) [4] and Sneha Ravindran et al (2020) [12] showed positive correlation between clinical and histopathological diagnosis in 95% and 90% cases respectively, whereas Studies conducted by S. K. Abdullah Ahmed et al (2021) [16] and Isha Bohra et al (2019) [17] showed positive correlation between clinical and histopathological diagnosis only in 54% and 56.5% cases respectively.

Conclusion

In the present study, 75 cases of Hyperpigmented Skin Lesions were evaluated for clinico-histopathological features, out of which, 37 cases (49.33%) were male and 38 cases (50.67%) were females with male to female ratio of 1:1.03. Age of the patients ranges from 11 years to 82 years with most common age group being 21 to 40 years constituted 32 cases (42.67%), followed by age group of 41-60 years constituted 26 cases (34.67%). Least common age group ranges from 80 years onwards constituted only 1 case (1.33%). The mean age of the patients is 36.15 years and standard deviation (SD) is 36.15 ± 3.53 (at 95% confidence interval). Out of total 75 cases, 63 cases (84%) are non-neoplastic & 12 cases (16%) cases are found neoplastic with the ratio of neoplastic to non-neoplastic lesions of 1:5.25. Among non-neoplastic lesions, inflammatory lesions are most common (49 cases out of 63) followed by infective and metabolic lesions, whereas benign lesions are commoner (constituting 8 cases out of total 12) than the malignant ones among neoplastic lesions.

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