Section: Dermatology

Original Research Article

STUDY OF DERMOSCOPIC FEATURES OF BENIGN MELANOCYTIC NAEVI IN NORTH KARNATAKA POPULATION

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Corresponding Author:
Dr. Kiran Dhannur,
Email: kirandhannur94@gmail.com.

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Kiran Dhannur[1]

[1]Post Graduate IIIrd Year, Department of Dermatology, Khaja Banda Nawaz University, Faculty of Medical Sciences, Kalaburagi, Karnataka, India.

Abstract

Background: Benign melanocytic naevi are categorized as congenital and acquired. These benign melanocytic naevi impair normal social life due to the unusual appearance of the skin. **Material and Methods:** 50 (fifty) patients with benign melanocytic Naevi were studied. Out of fifty, five had congenital melanocytic naevi, forty-five had acquired melanocytic naevi. Each patient was studied with a Dermlite DL-4 dermatoscope. Exposure to UV rays, family history, occupation, skin type, and color of naevi were noted. **Results:** Among the 50 patients studied, highest 16 (32%) were students, and least 2 (4%) were retired. Skin type analysis revealed that 47 (94%) had type-5 skin, and 3 (6%) had type-4 skin. Additionally, 41 (82%) patients reported exposure to UV rays. The predominant colors of naevi were as follows: brown in 34 (68%) patients, black in 10 (20%), and a mixed pattern in 20 (44.4%). Homogeneous naevi were observed in 11 (24.4%) patients, while 7 (15.5%) had a multi-component pattern. In the comparative analysis of naevi color and skin type, the mixed pattern of nevi was notably prevalent. All three parameters had a significant p value ($p<0.001$). **Conclusion:** This clinical and epidemiological study underscores the prevalence of brown-colored naevi among patients with type-5 dermoscopic skin. Such insights are crucial for dermatologists to effectively manage these conditions, minimize morbidity, and enhance patients quality of life.

INTRODUCTION

The term nevi refers to mole. The origin and natural history of melanocyte naevi are a matter of debate. There are two theories proposed for this reward. Abtropfung theory and Hochsteigerung theory. Both theories are contradictory to each other. The Abtropfung theory states that melanocyte Naevi originates from the epidermis and drops to the dermis.[1] Hochsteigerung theory states that melanocytes that originate at the neural crest start at the dermis and migrate up to the epidermis.[2] Dermoscopy was invented by Rona Mackie, a Scottish dermatologist, in 1971. This technique was land mark to diagnose and differentiate malignant versus benign pigmented skin lesions.[3] Since then, a whole series of dermoscopic structures, features, and patterns have been identified. Dermoscope improves the accuracy of diagnosing melanoma and can be helpful in differentiating other pigmented lesions.[4]

Congenital melanocytic nevi arise from the proliferation of nevomelanocytes in the epidermis or dermis and are present at birth or appear shortly thereafter. Acquired melanocytic nevi encompass common melanocytic, atypical spitz, blue, and halo nevi. They typically begin as brown to black macules and can develop into dome-shaped, cerebriform, or pedunculated papules or nodules. These nevi increase in number and size until the third decade of life, often regressing thereafter. In adulthood, these benign melanocytic nevi can significantly impact social life. Therefore, this study aims to document the clinical and epidemiological characteristics, as well as dermatoscopic patterns, of benign melanocytic nevi.

MATERIALS AND METHODS

50 (fifty) patients aged between 10 to 65 years of age attended the dermatology department of KBN University, Faculty of Medical Sciences, Kalaburagi, Karnataka – 585104, and were enrolled in the study.

Inclusive Criteria: Patients clinically diagnosed with congenital or acquired melanocytic naevi who provided written consent for participation were included.

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Exclusion Criteria: Patients diagnosed with seborrheic keratosis, ephelides, or lentigines were excluded from the study.

Methods: All patients diagnosed with congenital and acquired melanocytic naevi underwent routine dermatological examination using dermatoscopy. Histopathological examination was performed when indicated. Lesions were categorized as congenital or acquired based on clinical findings. Factors such as pigmentation pattern, nevus color, occupation, family history, UV ray exposure, history of melanoma, pregnancy, and growth dynamics were documented.

The Dermlite DL-4 dermatoscope was utilized for dermatoscopic analysis in this study. Dermatoscopic features including color, pattern, pigment distribution, and special sites were evaluated. Lesions displaying two distinct patterns were classified as mixed patterns, while those with more than two patterns were labeled as multi-component patterns.

Duration of study: May 2023 to May 2024

Statistical Analysis: Various parameters were categorized by percentage. Additionally, comparisons of skin type, nevus color, and pattern were evaluated using t-tests. Statistical analyses were performed using SPSS software. The male-to-female ratio was 2:1.

RESULTS

Table 1: Clinical manifestation

1. The occupation with the highest number was 16 (32%) students, 14 (28%) laborers, 10 (20%) professionals, 8 (16%) house wife and the least number was 2 (4%) retired.
2. Skin type: type-5: 47 (94%), type-4: 3 (6%).
3. Provisional diagnosis: 45 (90%) acquired Naevi, 5 (10%) congenital Naevi.
4. The history of exposure to ultraviolet rays: 41 (82%) Yes, 9 (18%) No.

Clinical type of acquired Naevi: 7 (14%) compound, 9 (18%) intradermal, and 34 (68%) junctional.

Table 2: Study of Dermoscopic Features

- Highest color was 34 (68%) which was brown, 10 (20%) black, 3 (6%) brownish black, 1 (2%) blue, 1 (2%) brownish grey, 1 (2%) mixed, and 1 (2%) multi compound.
- Mixed pattern Naevi: 18 (36%) reticulo-homogenous, 16 (32%) globulo-homogenous, 4 (8%) reticulo-congenital Naevi, 1 (2%) Reticulo-globular, 1 (2%) Reticulo-homogenous.
- Pigmentation of Naevi: 5 (10%) central hyper-pigmentation, 3 (6%) multi-focal hyper-pigmentation, 1 (2%) central hypo-pigmentation, and 1 (2%) eccentric.
- Follicular changes of Naevi: 48 (96%) were absent, 1 (2%) peri-follicular hyper-pigmentation, and 1 (2%) peri-follicular hypopigmentation.
- Vascular changes in Naevi: 46 (92%) patients had no changes in vessels, 1 (2%) had dotted vessels, 2 (4%) comma shaped vessels, linear 1 (2%).

Table 3: Comparison between skin type with color and pattern of Naevi and Fitz skin type (type-4 and type-5) was compared, and p<0.001 (p value was highly significant).

- Patten of Naevi and Fitz skin types was compared, and p<0.001 (p value was highly significant).
- The mixed pattern of Naevi was compared with Fitz skin type and p<0.001 (p value was highly significant)

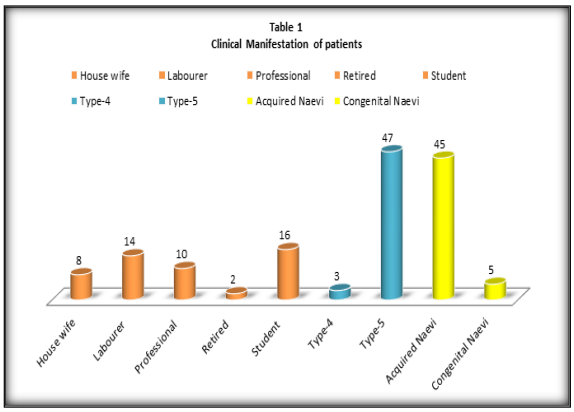

Figure 1: Clinical Manifestation of patients

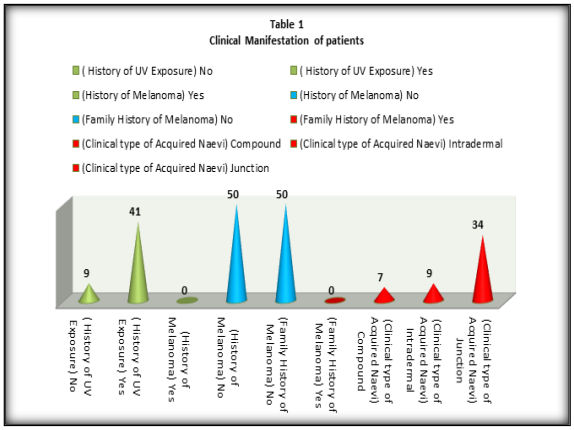

Figure 1: Clinical Manifestation of patients

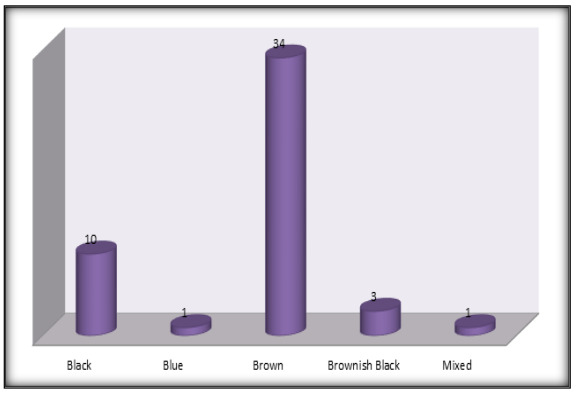

Figure 2: Study of Dermoscopic Features (color of Naevi)

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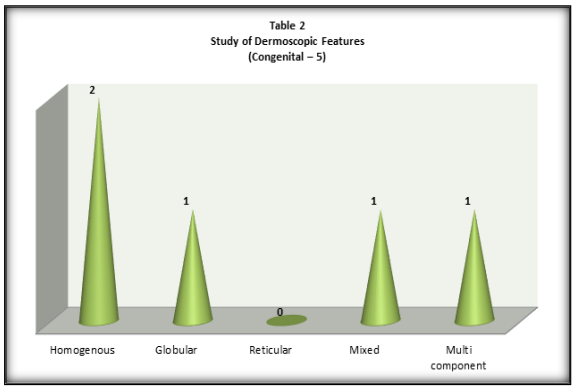

Figure 2: Study of Dermoscopic Features (Congenital – 5)

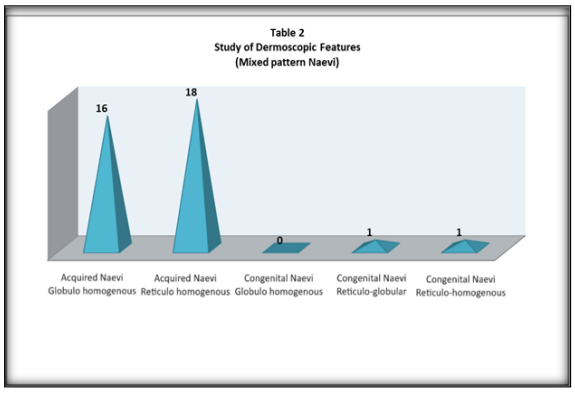

Figure 2: Study of Dermoscopic Features (Mixed pattern Naevi)

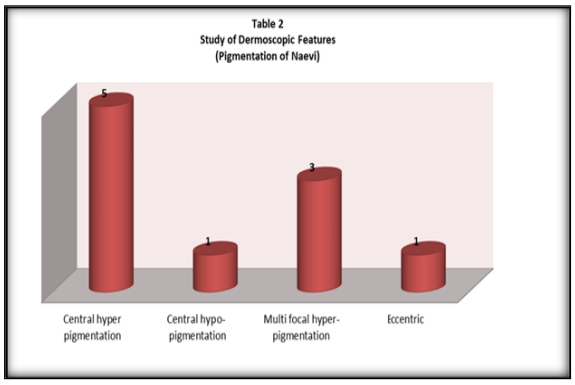

Figure 2: Study of Dermoscopic Features (Pigmentation of Naevi)

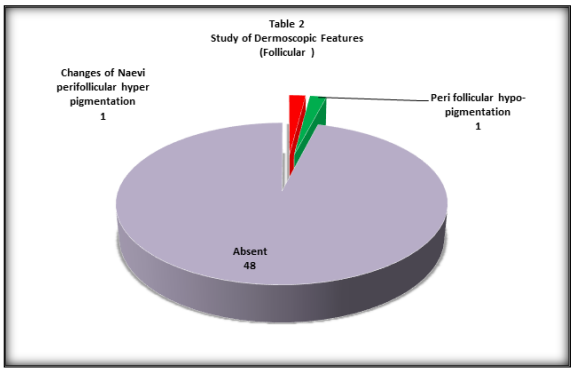

Figure 2: Study of Dermoscopic Features (Follicular)

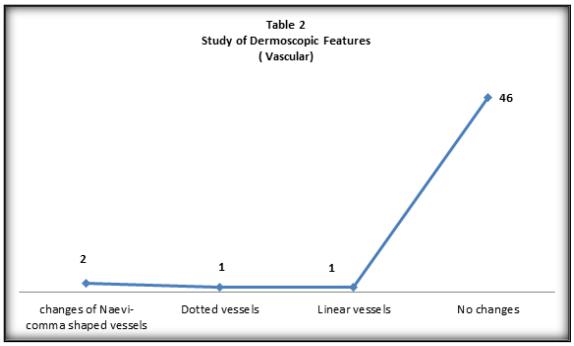

Figure 2: Study of Dermoscopic Features (Vascular)

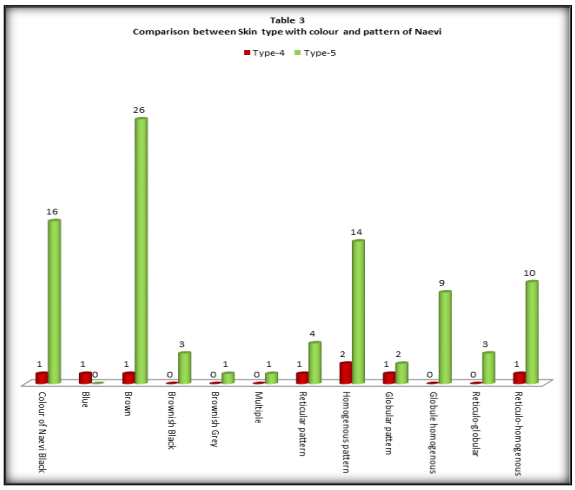

Figure 3: Comparison between Skin type with colour and pattern of Naevi

Table 1: Clinical Manifestation of patients **No: of patients: 50**

Clinical Manifestation	No. of patients	Percentage (%)
A. Occupation		
House wife	8	16
Labourer	14	28
Professional	10	20
Retired	2	4
Student	16	32
B. Skin type		
Type-4	3	6
Type-5	47	94
C. Provisional Diagnosis		
Acquired Naevi	45	90
Congenital Naevi	5	10
D. History of UV Exposure		
No	9	18
Yes	41	82
E. History of Melanoma		

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Yes	0	00
No	50	100
F. Family History of Melanoma No	50	100
Yes	0	00
G. Clinical type of Acquired Naevi Compound	7	14
Intradermal	9	18
Junction	34	68

Table 2: Study of Dermoscopic Features **No: of patients: 50**

A. color of Naevi	No. of patients	Percentage (%)
Black	10	20
Blue	1	2
Brown	34	68
Brownish Black	3	6
Mixed	1	2
B. pattern of Naevi 1. Acquired Naevi (45) multiple		
Homogenous	11	24.4
Globular	2	4.4
Reticular	5	11.11
Mixed	20	44.4
Multi component	7	15.5
2. Congenital – 5		
Homogenous	2	40.1
Globular	1	20
Reticular	0	00
Mixed	1	20
Multi component	1	20
3. Mixed pattern Naevi a. Acquired Naevi Globulo homogenous	16	32
Reticulo homogenous	18	36
b. Congenital Naevi Globulo homogenous	0	00
Reticulo-congenital	4	8
Reticulo-globular	1	2
Reticulo-homogenous	1	2
4. Pigmentation of Naevi Central hyper-pigmentation	5	10
Central hypo-pigmentation	1	2
Multi focal hyper-pigmentation	3	6
Eccentric	1	2
5. Follicular Changes of Naevi perifollicular hyperpigmentation	1	2
Perifollicular hypopigmentation	1	2
Absent	48	96
6. Vascular changes of Naevi comma shaped vessels	2	4
Dotted vessels	1	2
Linear vessels	1	2
No changes	46	92

Table 3: Comparison between Skin type with color and pattern of Naevi

Details	Fitz skin type		p value
	Type-4	Type-5	
A. Color of Naevi Black	1	16	P<0.001
Blue	1	0	
Brown	1	26	
Brownish Black	0	3	
Brownish Grey	0	1	
Multiple	0	1	
B. Pattern of Naevi Reticular pattern	1	4	P<0.001
Homogenous pattern	2	14	
Globular pattern	1	2	
C. Mixed pattern of Naevi Globule homogenous	0	9	P<0.001
Reticulo-globular	0	3	
Reticulo-homogenous	1	10	

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DISCUSSION

This study examines the dermoscopic features of benign melanocytic naevi in the North Karnataka population. In our analysis of occupations, students represented the largest group at 16 (32%), while retirees were the least represented with 2 (4%). Analysis of skin types revealed that type-5 was predominant at 47 (94%), whereas type-4 accounted for 3 (6%) cases. Among the naevi studied, 5 (10%) were congenital, and 45 (90%) were acquired. Clinical types of acquired naevi included 34 (68%) junctional, 9 (18%) intradermal, and 7 (14%) compound types.[Table 1] The most prevalent pattern of naevi was mixed, observed in 20 (44.4%) cases, while the least common was globular, observed in 2 (4.4%) cases. Among congenital cases, 2 (4%) exhibited a homogeneous pattern. In the pigmentation study, central hyperpigmentation was most frequent, observed in 5 (10%) cases, while eccentric pigmentation was noted in only 1 (2%) case. Follicular changes in naevi were absent in 48 (96%) cases, and vascular pattern changes were absent in 46 (92%) cases.[Table 2] In a comparative study between skin type, color pattern, and mixed pattern, the review p value was highly significant.[Table 3] These findings are more or less in agreement with previous studies.[5,6,7]

In benign pigmented skin lesions, they typically exhibit symmetry and contain one or two metrics with multiple colors. Dermatoscopic structures in benign lesions are generally regular in size, shape, and uniform throughout. Conversely, malignant lesions often display irregularly shaped structures arranged in a non-uniform or haphazard manner.

Blue Naevi and other dermal melanocytes are characterized clinically by their slate-grey to blue diffuse color. Common blue Naevi are well-circumscribed, dome shaped papules, often less than 1 cm in diameter. Halo Naevi usually has a zone of hypo-pigmentation or de-pigmentation around pre-existing melanocyte neoplasm.[8]

Genetic factors directly determine an individual's potential for the development of melanoma. The final expression of this potential is expressed by solar exposure.

In the case of the presence of pigment, it is usually homogenous, light brown in color, or occasional globules can be seen. They are characterized by the presence of vascular structures. Dilated blood vessels could be visualized mostly as comma vessels or hairpin vessels and occasionally as dotted vessels.[9] It is hypothesized that hypo-pigmentation could be due to the accumulation of pigmented nevus cells in the perifollicular location. The nevus cells have a tendency to invade the appendageal structures.[10]

The rapid increase in mole counts in both sizes during puberty strongly suggests a hormonal influence on the pigment-producing activity of naevus cells. This may be either due to the de-novo appearance and proliferation of pigment-producing naevus cells or to the activation of the melanin-producing enzyme pathway of pre-existing, inactive, non-pigment-producing, and therefore invisible, naevus cells .[11]

It is interesting to note that phenotypic characteristics such as hair color, eye color, skin color, and freckling tendency do not appear to be related to mean total mole counts.[12]

CONCLUSION

Dermoscopy is an effective alternative to histopathology because it is cost-effective and non-invasive. Dermoscopy is a relatively new modality. In this study, a homogeneous pattern was more frequently observed in patients with skin type-5, who also exhibited a higher prevalence of brown-colored nevi. This finding and observation contribute to the growing body of knowledge on dermoscopic variability across population. The present study demands a larger sample size to validate these findings, as the exact formation and proliferation of melanocytic nevi remain unclear.

Limitation of study: Owing to the tertiary location of the research center, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

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