Section: Dermatology

Original Research Article

DERMOSCOPIC FEATURES OF BENIGN MELANOCYTIC NAEVI -A DESCRIPTIVE STUDY

S. Joe Angelo[1], A. Krishnaveni[2], D. Kavi[3], J. Manjula[4]

[1]Assistant Professor, Department of Dermatology, Venereology & Leprosy, Government Kilpauk Medical College, Tamilnadu, India.
[2]Assistant Professor, Department of Dermatology, Venereology & Leprosy, Government Kilpauk Medical College, Tamilnadu, India.
[3]Consultant, Department of Dermatology, Venereology & Leprosy, Mithran Skin Care, Villupuram, Tamilnadu, India.
[4]Professor, Department of Dermatology, Venereology & Leprosy, Government Kilpauk Medical College, Tamilnadu, India.

Received : 22/12/2023
Received in revised form : 19/02/2024
Accepted : 04/03/2024

Keywords:
Dermoscopic; Benign; Melanocytic naevi; Naevi; Congenital naevi.

Corresponding Author:
Dr. S. Joe Angelo,
Email: joeangelo75@gmail.com

DOI: 10.47009/jamp.2024.6.2.38

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (2); 182-187

Abstract

Background: Dermatoscopy plays a crucial role in evaluation of pigmented skin lesions. **Aim:** This study assessed the predominant dermatoscopic pattern of benign melanocytic naevi. **Material and Methods:** This was a prospective cross-sectional study. A total of 160 patients with benign melanocytic naevi who attended the Dermatology OPD at the Government Kilpauk Medical College between September 2020 and September 2021 were included in the study. All benign melanocytic naevi in the study population were examined clinically and using dermatoscopy. **Results:** Most of our study participants were female (56.87%), with skin type 5 (96.8%), with a mean age of 31.36 ± 15.58 years. The colour of the naevi was black in the majority 68.7% of participants. Acquired naevi were found in 91.25% participants, congenital naevi in 8.7% of participants, whereas Miescher naevi were found in 8.75% and Unna naevi in 4.38%. Among the acquired and congenital melanocytic nevi, the homogeneous pattern was the most common seen in 23.75% and 3.75% of the individuals respectively. The majority (27.5%) of participants had a homogeneous pattern of naevi. The age of the participants was not significantly associated with the colour or pattern of the naevi. Homogeneous patterns were more frequent in children and adults. Participants with Skin type 5 were more frequently found to have brown-coloured naevi, which was statistically significant ($p<0.001$). **Conclusion:** Homogeneous patterns were found more frequently in children and adults. There was no significant association between age and the naevi pattern. Participants with Skin type 5 were more frequently found to have brown-coloured naevi.

INTRODUCTION

Melanocytic naevi are benign proliferations of a type of melanocytic cell known as *"naevus cell"*.[1] Naevus cell clusters are a nest of cells in the lower epidermis or dermis. In contrast, epidermal melanocytic cells are spread evenly as a single unit. Naevus cells do not have dendritic processes apart from those within blue naevi. Melanocytes and naevus cells produce melanin. Melanocytes are primarily located in the skin, eye, and hair. Melanocytic naevi may be either congenital or acquired. Acquired naevi were classified as either common or atypical. Furthermore, there are variants, such as halo naevi, blue naevi, and spitz naevi. The names applied to acquired naevi like junctional naevi, compound naevi and intradermal naevi, reflect the location of the nests of melanocytes.[2] A nest is defined as three or more melanocytic cells in direct contact with one another. Melanocytic neoplasms are also known as naevi. Differentiation of melanocytic naevi with atypical features from malignant melanomas is essential.

Benign melanocytic naevi are slow-growing tumours characterised by various morphologies. Prompt diagnosis of melanocytic naevi is essential for correctly classifying and subtyping benign melanocytic neoplasms and differentiating melanocytic naevi from melanoma. Differentiation from melanoma is more difficult in cases of atypical melanocytic naevi. Atypical melanocytic naevi are defined based on clinical, dermatoscopic, and histological criteria. The early detection of melanomas requires special knowledge and employment of diagnostic methods, including dermatoscopy. Dermatoscopy can play a crucial role

ISSN (O): 2687-5365; ISSN (P): 2753-6556

in differential diagnosis.[3] Dermatoscopy improves diagnostics, especially in differentiating benign and malignant melanocytic tumours.

Dermatoscopy is a non-invasive tool that facilitates deep examination of the morphology of the naevus and identifies malignant lesions at an early stage. Dermatoscopy is primarily used to examine pigmented skin lesions. However, it can also help assess lesions with little or no pigment.[4] Dermatoscopy is performed with the help of a handheld instrument called a dermatoscope, which helps to visualise skin structures in the epidermis, dermo-epidermal junction, and upper dermis. The naked eye cannot usually see these structures.

A dermatoscope is an important tool in daily practice as it offers a telescopic view of pigment patterns, vascular patterns, and appendageal structures. Most dermatoscopic colours and structures correspond to histopathological correlates. Thus, dermatoscopy acts as a valuable bridge between the clinical and histopathological criteria, which assists us in predicting the histopathological diagnosis of melanocytic naevi better.[1] Moreover, dermatoscopy helps to observe naevi over a time period without needing a biopsy. In recent years, various epidemiological investigations have focused on the effects of factors such as age, sex, and lesion site on the prevalence and distribution of melanocytic naevi.[3,5] However, studies evaluating the dermatoscopic features of melanocytic naevi in India are limited. Hence, the present study assessed the predominant dermatoscopic patterns of benign melanocytic naevi.

MATERIALS AND METHODS

This prospective cross-sectional study included 160 patients with clinically diagnosed congenital and acquired melanocytic naevi attending the Department of Dermatology, Venereology & Leprosy, Government Kilpauk Medical College, Chennai. The study was conducted between September 2020 and September 2021 after obtaining approval from the Institutional Human Ethics Committee.

Inclusion Criteria

Patients with clinically diagnosed congenital and acquired melanocytic naevi who attended the OPD between September 2020 and September 2021 were included.

Exclusion Criteria

Patients with seborrheic keratoses, ephelides, freckles, or lentigines were excluded from the study.

Methodology

All the patients diagnosed with congenital and acquired melanocytic naevi underwent routine dermatological examination. Informed written consent was obtained from all patients. All benign melanocytic naevi in the study population were examined clinically and using dermatoscopy. Histopathological examination was performed when indicated. The lesions were broadly divided into congenital and acquired types. Patient-related factors that might influence the pigmentation pattern of individual naevi were noted using a pro forma. Patient details included age, skin type, UV exposure, history of melanoma, pregnancy, and growth dynamics.

All benign melanocytic naevi in the study population were examined by dermatoscope. The dermatoscope used in this study was Dermlite DL4. Dermatoscopic features were noted and documented digitally, including colour (black, brown, grey, blue), pattern (globular, reticular, homogeneous, parallel, streak), pigment distribution (multifocal, central, eccentric, uniform), and special sites (face, acral areas, nail, mucosa). When two of these patterns were present, it was termed a 'mixed pattern'. It was termed a 'multi-component pattern ' when three or more patterns were present.

Statistical Methods

The data were entered into Microsoft Excel and analysed using the Statistical Package for Social Sciences (SPSS). Mean and standard deviation were used to summarise the quantitative variables. Frequency and proportion were used to summarise categorical variables. The chi-squared test was used to test for statistical significance. Statistical significance was set at $p < 0.05$.

RESULTS

Of the 160 patients, 91 (56.87%) were female. The mean age of the study participants was 31.36 ± 15.58 years. Approximately 50% of patients were aged 20–40 years. Most participants were 52 students (32.5%). Most participants, 155 (96.8%), had skin type 5, while the rest had type 4 skin. Acquired naevi were found in 146 (91.25%)participants, congenital naevi in 14 (8.7%) participants, whereas Miescher naevi were found in 15 (8.75%) and Unna naevi in 7 (4.38%) individuals. The mean size of acquired naevi was 3.05 ± 1.22, and the mean size of congenital naevi was 12.86 ± 16.8. Naevi was black in the majority, 110 (68.7%), and brown in 49(30.6%). In acquired naevi, the homogeneous pattern was the most common 38 (23.75%), followed by the reticular pattern 14 (8.75%). The homogeneous pattern was also the most common in congenital naevi (6 participants), and 2 had a globular pattern. One hundred and thirty participants had a history of UV exposure. None of the patients had a family history of melanoma. [Table 1]

A total of 44 (27.5%) participants had a homogeneous pattern of naevi. A globular pattern was seen in eight participants, and a reticular pattern was seen in 14 (8.75%) participants (Figure 1). Reticulohomogeneity was the most common mixed pattern in 31 (19.37%) patients with acquired naevi, followed by a globulohomogeneous pattern in 28 (17.5%) patients and reticuloglobular in 5 (3.13%).

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Among the congenital naevi, one was reticuloglobular, and one was reticulohomogeneous. Multi-component naevi were found in 13 participants (8.13%) (10 acquired and three congenital). (Table 1). An atypical naevus was observed in one participant. Histopathological examination of the atypical naevus proved it to be benign.

Central hyperpigmentation was observed in 16 (10%) participants, central hypopigmentation in 1 (0.63%), and eccentric hyperpigmentation in 4 (2.5%). A multifocal hyperpigmentation pattern was observed in 9 participants (5.62%). Comma-shaped vessels were observed in four (2.5%) participants; one (0.63%) had dotted vessels, and one had linear vessels. [Table 2, Figure 2]

The age of the participants showed no significant association (p=0.966) with naevi colour. Homogeneous patterns were more frequent in children and adults. There was no significant association between age and the naevi pattern. Participants with Skin type 5 were more frequently found to have brown-coloured naevi, which was statistically significant (p<0.001). No significant association was found between skin type and naevi pattern. [Tables 2 and 3]

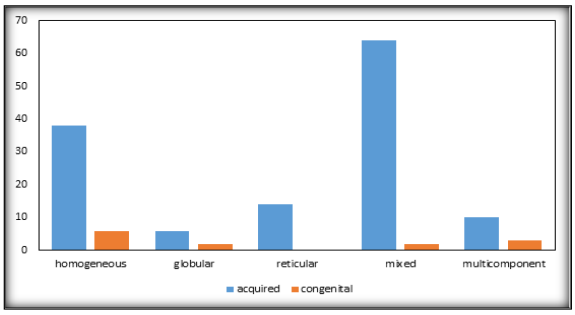

Figure 1: Observation of patterns of naevi among all subjects

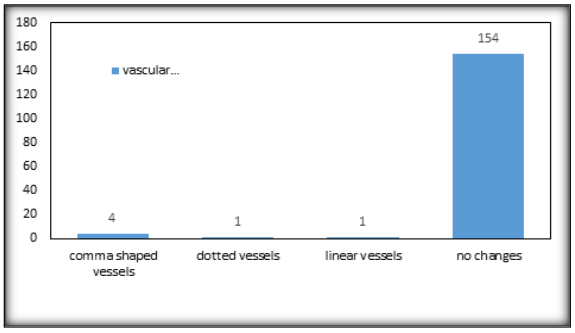

Figure 2: Observation of vascular changes among all subjects

Table 1: Observation of demographic and other evaluation variables of all subjects

Parameters		Frequency (%)
Gender	Male	69 (43.15%)
	Female	91 (56.87%)
Age group (years)	0-9	7 (4.02%)
	10-19	26 (16.25%)
	20-29	54 (33.75%)
	30-39	33(20.5%)
	40-49	20 (12.5%)
	50-59	11 (6.88%)
	60-69	5 (3.12%)
	70-79	3 (1.87%)
	80-89	1 (0.63%)
Occupation	Housewife	27 (16.87%)
	Labourer	41 (25.62%)
	Professional	33 (20.63%)
	Retired	7 (4.38%)
	Student	52 (32.5%)
Skin type	Type 4	5 (3.12%)
	Type 5	155 (96.88%)
Provisional diagnosis	Acquired naevi	146 (91.25%)
	Congenital naevi	14 (8.75%)
History of UV exposure	No	30 (18.75%)
	Yes	130 (81.25%)
History of melanoma	No	160 (100%)
	Yes	0 (0%)
Family history of melanoma	No	160 (100%)
	Yes	0 (0%)
Colour of naevi	Black Blue Brown	110 (68.75%) 1 (0.62%) 49 (30.63%)
Clinical type of Acquired naevus	Compound Intradermal Junctional	19 (14.38%) 23 (14.3%) 103 (69.38%)
Dermascopic features		
Colour of naevi	Black	32 (20%)
	Blue	1 (0.63%)
	Brown	114 (71.24%)
	Brownish black	11 (6.25%)
	Brownish grey	1 (0.63%)

ISSN (O): 2687-5365; ISSN (P): 2753-6556

		Multiple	1 (0.63%)
Pattern of naevi	Acquired naevi	Homogeneous	38 (23.75%)
		Globular	6 (3.75%)
		Reticular	14 (8.75%)
		Mixed	64 (40%)
		Multicomponent	10 (6.25%)
	Congenital naevi	Homogeneous	6 (3.75%)
		Globular	2 (1.25%)
		Reticular	0 (0%)
		Mixed	2 (1.25%)
		Multicomponent	3 (1.87%)
Mixed patterns of naevi	Acquired naevi	Globulohomogeneous	28 (17.5%)
		Reticuloglobular	5 (3.12%)
		Reticulohomogeneous	31 (19.37%)
	Congenital naevi	Globulohomogeneous	0 (0%)
		Reticuloglobular	1 (0.63%)
		Reticulohomogeneous	1 (0.63%)
Pigmentation of naevi		Central hyperpigmentation	16 (10%)
		Central hypopigmentation	1 (0.63%)
		Multifocal hyperpigmentation	9 (5.62%)
		Eccentric	4 (2.5%)
Follicular changes of naevi		Perifollicular hyperpigmentation	1 (0.63)
		Perifollicular hypopigmentation	1 (0.63)
		Absent	158 (98.74%)
Vascular changes of naevi		Comma shaped vessels	4 (2.5%)
		Dotted vessels	1 (0.63%)
		Linear vessels	1 (0.63%)
		No changes	154 (96.24%)

Table 2: Association between Age and colour of naevi and pattern of naevi

Variables	Age Group (years)									P-value
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	
Colour of naevi										
Black	2	7	11	7	4	1	0	0	0	0.966
Blue	0	0	1	0	0	0	0	0	0	
Brown	4	15	38	22	16	8	5	2	1	
Brownish black	0	3	3	4	0	1	0	0	0	
Brownish grey	**0**	0	1	0	0	0	0	0	0	
Multiple	0	0	0	0	0	1	0	0	0	
Pattern naevi										
Reticular pattern	1	2	2	3	2	1	2	1	0	0.228
Homogeneous pattern	2	6	20	8	5	2	1	0	0	0.747
Globular pattern	0	0	2	0	3	2	0	0	0	0.269

Table 3: Association between skin type with colour and pattern of naevi

Variables	Fitz skin type		P-value
	Type 4	Type 5	
Colour of naevi			
Black	1	31	<0.001
Blue	1	0	
Brown	2	109	
Brownish black	1	10	
Brownish grey	0	1	
Multiple	0	1	
Pattern naevi			
Reticular pattern	1	13	0.366
Homogeneous pattern	2	42	0.525
Globular pattern	1	6	0.219
Mixed pattern of naevi			
Globulo homogeneous	0	28	0.684
Reticulo globular	0	6	
Reticulo homogeneous	1	31	

DISCUSSION

In total, 160 individuals participated in this study. A female predominance of 69 (56.87%) patients was observed in our study. The mean age of the study participants was 31.36 ± 15.58 years. Approximately 50% of our study population was in the age group of 20–40 years. Most of the study population comprised 52 students (32.5%). These findings in the present study are following earlier reported studies.6 In our study, 155 (96.8%) participants had skin type 5, while the rest had type 4 skin. The mean size of acquired naevi was 3.05 ± 1.22, and the mean size of congenital naevi was

ISSN (O): 2687-5365; ISSN (P): 2753-6556

12.86 ± 16.8. The colour of the naevi was black in the majority of 110 (68.7%) participants and brown in 49(30.6%). Yarak et al. also showed similar findings in their investigations.[7]

In our study, acquired naevi were found in 146 (91.25%) participants, congenital naevi in 14 (8.7%) participants, whereas Miescher naevi were found in 15 (8.75%) and Unna naevi in 7 (4.38%) individuals. In acquired naevi, a homogeneous pattern was the most common, 38 (23.75%), followed by a reticular pattern, 14 (8.75%). The homogeneous pattern was also the most common in congenital naevi (6 participants), and 2 had a globular pattern. Chuah et al. also showed that most subjects with acquired naevi had homogeneous patterns.[8] In our study, of all the participants, 130 had a history of UV exposure. None of the patients had a history of melanoma or a family history of melanoma. These findings are following the observation of Sosa-Seda et al. investigations.[9]

In our study, 44 participants had a homogeneous pattern of naevi, which was most common in children and adults. In a study by Milladi et al., a reticular pattern was the most common. The increased homogeneous pattern in our study may indicate the junctional nevus's progression to a compound nevus.10 In our study, central hyperpigmentation was observed in 16 (10%) participants, central hypopigmentation in 1 (0.63%), and eccentricity in 4 (2.5%). A multifocal hyperpigmentation pattern was observed in 9 participants (5.62%). These findings in our study are following earlier reported investigations.[11]

In our study, comma-shaped vessels were observed in 4 participants. One was dotted, and the other had a linear vessel. The dermatoscopy used in our study could not effectively capture vascular changes. However, similar results were reported by Neiderkone, where most of the study population had comma-shaped vessels. Comma-shaped vessels are typical of dermal naevi. However, atypical vessels are also seen.[5]

Homogeneous patterns were found more frequently in the children and adults in our study. However, other studies have also reported varying patterns with age. Zaludeuk has reported remarkable differences in different age groups to the predominant types of morphological patterns and pigment patterns seen.12 Globular patterns appeared to be the 'typical' type of naevi among children but were seen in < 10% of all naevi in the oldest age group. Reticular, homogeneous, and reticular-homogeneous types were observed in individuals older than 15, with reticular-homogeneous being the predominant morphological type. This difference could be explained by the lower number of children under ten years in our study population.

In our study, the age of the participants showed no significant association with naevi colour. Homogeneous patterns were more frequent in children and adults. There was no significant association between age and the naevi pattern. Participants with Skin type 5 were more frequently found to have brown-coloured naevi, which was statistically significant ($p<0.001$). As reported by Cook et al., the highest prevalence of naevi was found in adults aged 20–40.[13] These findings are similar to those of our study, with 53% of our study population in this age group. Higher sun exposure in this age group could explain this result.[5]

In our study, most participants (96.8%) had skin type 5. In another Indian study in Mumbai, only 56.9% had skin type 5 and 41.9% had skin type 4. This likely depicts the differences in skin types in various parts of the country. One case of atypical naevi was identified in the present study. This is an important finding despite being a single case, as atypical naevi is a melanoma precursor. Also, dermatoscopy could be useful for identifying lesions in which specific dermatoscopic features make the diagnosis of congenital naevi more likely. Furthermore, dermatoscopy can greatly help to classify lesions already identified as congenital going by definite clinical and anamnestic data and for a possible correlation of naevus phenotype and dermatoscopic patterns to the risk of developing malignant melanoma in prospective studies.[14]

Limitations of the study

Our study had no follow-up; therefore, the course of the naevi could not be determined. Because the study's sample size was small, the features of congenital naevi could not be generalised. Our dermatoscope (Dermlite DL4) could not effectively capture the vascular changes.

CONCLUSION

Benign melanocytic lesions are typically ignored in our country. This study could help us to understand the clinical features and dermatoscopic patterns of various benign melanocytic naevi. Dermatoscopic features are helpful for the diagnosis of benign melanocytic lesions. Further studies with larger sample sizes may better represent the benign melanocytic proliferation in our population. Follow-up dermatoscopy could help us understand the course of naevi. Studies with a greater number of children with naevi could help us to understand the features and course of congenital naevi.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556