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Original Research Article

Cutaneous Nevi: A Hospital Based Clinical Study

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Abstract:

Background: Nevi are frequently encountered cutaneous lesions that may be either congenital or acquired, originating from different tissues. Their clinical manifestations vary depending on factors such as age, gender, and histological subtype. Recognizing demographic distribution and clinical characteristics is important for accurate diagnosis and appropriate management.

Methods: A cross-sectional observational study was carried out among 100 patients presenting with different types of nevi. Demographic variables including age, gender, residence, and socioeconomic status were documented. Clinical parameters such as the type of nevus, tissue of origin, side of body involvement, and age at onset were evaluated. Statistical analysis was performed using suitable tests, and a p-value < 0.05 was considered statistically significant.

Results: Of the 100 patients included in the study, 52% were females and 48% were males, showing no statistically significant overall gender difference ($p = 0.68$). The largest proportion of patients (40%) belonged to the 1–10 years age group. In 56% of cases, nevi were present since birth, indicating a predominance of congenital lesions ($p < 0.001$). Epidermal nevi were the most common subtype (48%), followed by melanocytic nevi (31%). Becker's nevus demonstrated a significant male predominance ($p = 0.04$), whereas Nevus of Ota showed a higher occurrence among females ($p = 0.03$). No significant difference was noted with respect to the side of body involvement. A greater proportion of patients belonged to the Above Poverty Line category (66%), which was statistically significant ($p = 0.003$).

Conclusion: Nevi are more commonly observed in the pediatric age group and are frequently congenital in origin, with epidermal nevi representing the most prevalent subtype. Certain individual types of nevi exhibit gender predilection; however, the overall distribution between males and females remains relatively comparable.

Keywords: Nevi; Epidermal nevus; Melanocytic nevus; congenital lesions; Pediatric dermatology.

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Introduction

Cutaneous nevi, commonly known as moles, are benign proliferations of melanocytes that arise within the epidermis, dermis, or both layers of the skin. They represent one of the most common dermatological findings in the general population and may appear at any stage of life, although most develop during childhood and adolescence. The formation of cutaneous nevi is influenced by genetic predisposition, ultraviolet (UV) radiation exposure, and various environmental factors. Clinically, nevi present as well-circumscribed pigmented or non-pigmented lesions that vary in size, color, and morphology. They may appear as flat macules, slightly raised papules, or dome-shaped nodules depending on the location of melanocytic proliferation within the skin layers. Histologically, cutaneous nevi are classified into junctional nevi, compound nevi, and intradermal nevi based on the distribution of nevus cells at the dermo-epidermal junction and within the dermis [1,2]. The biological behavior of melanocytic nevi is generally benign; however, their clinical significance lies in their potential to mimic or transform into malignant melanoma, a highly aggressive skin cancer. Certain types of nevi, such as congenital melanocytic nevi, dysplastic nevi, and giant nevi, are associated with a higher risk of malignant transformation, making careful clinical

monitoring essential [3,4]. Epidemiological studies suggest that the number and distribution of nevi on the body are important risk markers for melanoma development, with individuals possessing numerous or atypical nevi demonstrating a higher susceptibility to melanoma [5]. Dermoscopic examination has significantly improved the diagnostic accuracy of distinguishing benign nevi from malignant lesions, allowing for early detection and management of suspicious changes [6].

Advances in molecular genetics have also enhanced understanding of the pathogenesis of melanocytic nevi. Mutations in genes such as BRAF and NRAS have been implicated in nevus formation and melanocyte proliferation, suggesting that nevi may represent clonal expansions of mutated melanocytes that undergo growth arrest due to cellular senescence mechanisms [7,8]. Management of cutaneous nevi typically involves clinical observation, dermoscopic surveillance, or surgical excision when malignancy is suspected or for cosmetic reasons [9].

Therefore, a comprehensive understanding of the clinical characteristics, histopathology, and potential malignant transformation of cutaneous nevi is essential for accurate diagnosis and effective patient management in dermatological practice [10].

Materials and Methods

This study was designed as an institution-based descriptive cross-sectional study conducted in the Department of Dermatology at Medical College & Hospital, Kolkata. Patients presenting with cutaneous nevi who fulfilled the predefined inclusion criteria and provided informed consent were enrolled in the study. The research included patients attending both the outpatient department (OPD) and inpatient department (IPD) of the dermatology unit.

The study was carried out over a period from January 2020 to March 2021. During this time, patient recruitment and clinical evaluation were performed. Subsequent data analysis and review of relevant literature were conducted between March 2021 and May 2021, followed by thesis preparation and submission from June 2021 to August 2021. The study was conducted in the Outpatient and Inpatient Departments of Dermatology at Medical College & Hospital, Kolkata, where all eligible patients attending the dermatology services during the study period were screened for inclusion. The study population comprised all patients visiting the dermatology OPD or admitted to the IPD during the study period who presented with cutaneous nevi. Based on hospital records from previous years, it was estimated that approximately 100 patients with cutaneous nevi would be recruited for the study. A consecutive sampling technique was used, in which all eligible patients presenting with cutaneous nevi during the study period were included provided they satisfied the inclusion and exclusion criteria.

Patients of all age groups and both sexes presenting with cutaneous nevi were included in the study. However, critically ill or moribund patients and those who declined or were unable to provide informed consent were excluded from participation.

Data collection and documentation were carried out using several study tools. These included a structured Case Record Form (CRF), OPD admission registers and OPD tickets, and an Informed Consent Form (ICF). Clinical examination was aided by a self-illuminating magnifying glass, and digital photographs of lesions were obtained using a digital imaging record system. In selected cases, histopathological slides were examined for confirmation. Relevant textbooks and scientific journals were consulted for reference, and collected data were entered and analyzed using computer hardware and appropriate statistical software.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS software version 27.0 (SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The unpaired t-test was used to compare continuous variables between independent groups, and the paired t-test was applied for within-group comparisons. Categorical variables were analyzed using the Chi-square test or Fisher's exact test as appropriate. A p-value of <0.05 was considered statistically significant.

Result

Table 1: Demographic Characteristics of Study Population (n=100)

Variable	Category	Number	Percentage (%)	p-value
Sex	Male	48	48%	0.68
	Female	52	52%	
Age Group (years)	1–10	40	40%	<0.001
	11–20	25	25%	
	21–30	23	23%	
	31–40	9	9%	

	>40	3	3%	
Residence	Rural	44	44%	0.21
	Urban	56	56%	
Income Group	APL	66	66%	0.003
	BPL	34	34%	

Among the 100 patients, females (52%) slightly outnumbered males (48%), with no significant gender difference ($p = 0.68$). Most patients were in the 1–10 years age group (40%), showing a significant age distribution ($p < 0.001$). Urban residents accounted for 56% and rural residents 44% ($p = 0.21$). A majority of patients (66%) belonged to the APL category, which was statistically significant ($p = 0.003$).

Table 2: Types of Nevi According to Tissue of Origin (n=100)

Type of Nevus	Number	Percentage (%)
Epidermal Nevi	48	48%
Melanocytic Nevi & Dermal Lesions	31	31%
Hypomelanotic Nevoid Conditions	12	12%
Vascular Nevi	9	9%

Among the 100 cases analyzed, epidermal nevi constituted the largest group, accounting for 48% of the cases. Melanocytic nevi and dermal melanocytic lesions together comprised 31% of the study population. Hypomelanotic nevoid conditions were observed in 12% of patients, while vascular nevi formed the smallest category, representing 9% of cases. These findings indicate that epidermal nevi were the most common type observed in the study, followed by melanocytic nevi.

Table 3: Gender Distribution of Individual Types of Nevi

Type of Nevus	Male	Female	p-value
Becker's Nevus	10	5	0.04
Nevus of Ota	1	5	0.03
Infantile Haemangioma	1	3	0.29
Mongolian Spot	3	1	0.18
VEN	5	7	0.56
ILVEN	2	4	0.41
Nevus Sebaceous	3	9	0.05
Others (Combined)	23	18	0.62

Ecker's nevus showed significant male predominance ($p = 0.04$), whereas Nevus of Ota showed female predominance ($p = 0.03$). Other types of nevi did not show significant gender differences ($p > 0.05$).

Table 4: Side of Body Involved

Side Involved	Number	Percentage	p-value
Right	48	48%	0.44
Left	41	41%	
Both	11	11%	

Analysis of the side of body involvement showed that 48% of nevi were located on the right side, 41% on the left side, and 11% involved both sides of the body. Although right-sided involvement was slightly more common than left-sided involvement, the difference was not statistically significant ($p = 0.44$), suggesting no clear lateral preference in the distribution of nevi.

Table 5: Age of Appearance of Different Types of Nevi

Age of Appearance	Number of Cases	Percentage (%)
At Birth	56	56%
1 month – 1 year	7	7%
1 – 10 years	16	16%
>10 years	21	21%

The analysis of the age of onset revealed that the majority of nevi (56%) were present at birth, indicating a predominantly congenital origin. A smaller proportion of lesions appeared between 1 month and 1 year of age (7%), while 16% developed between 1 and 10 years. The remaining 21% of lesions appeared after 10 years of age. These findings suggest that most nevi were congenital, although a significant number developed later during childhood and adolescence.

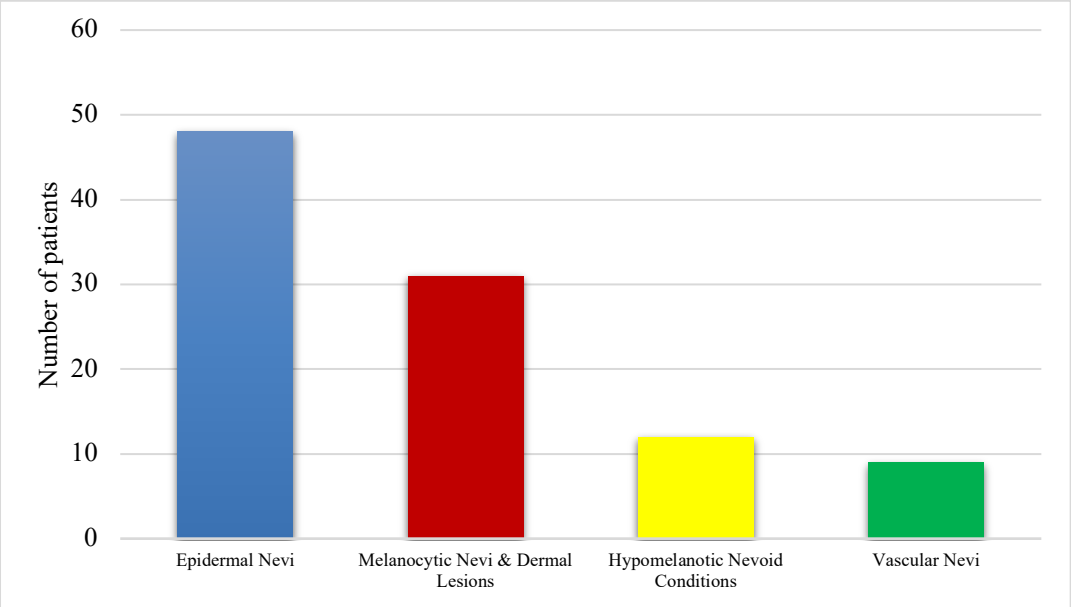

Figure 1: Types of Nevi According to Tissue of Origin

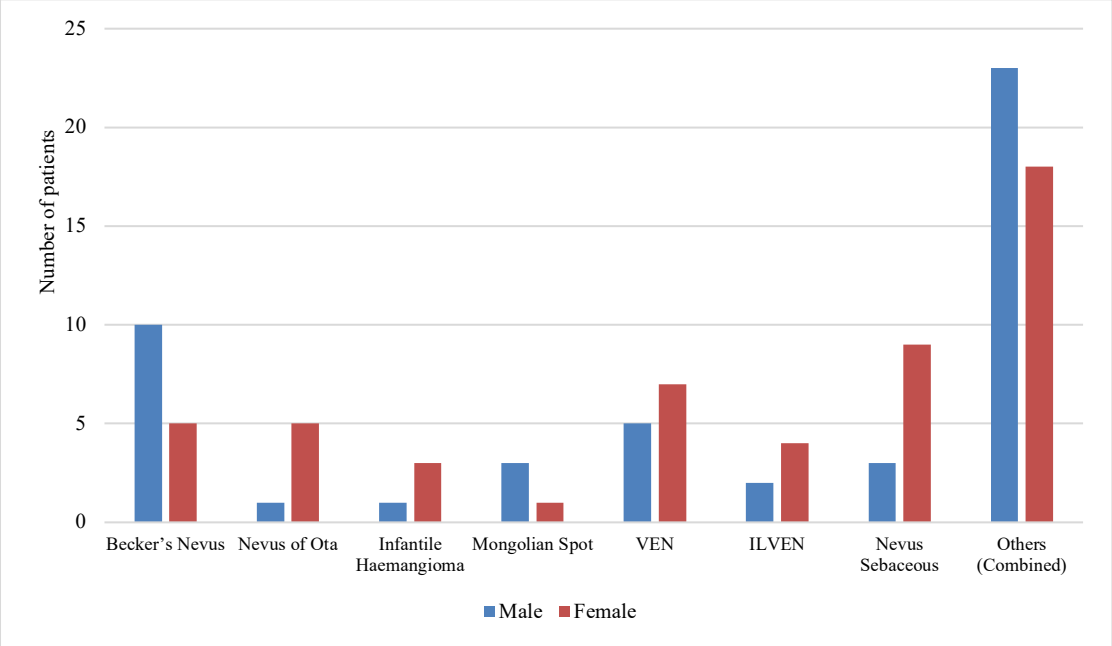

Figure 2: Gender Distribution of Individual Types of Nevi

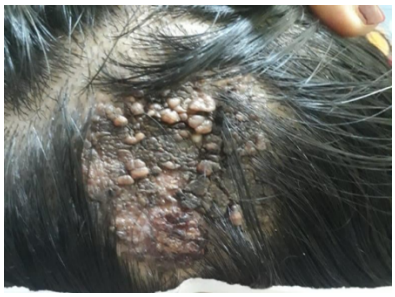

Figure 3: Nevus Sebaceous over scalp

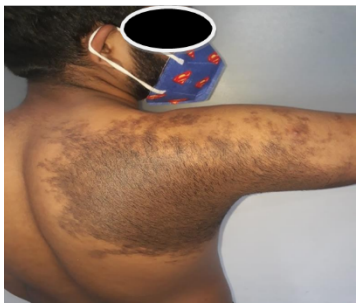

Figure 4: Becker's nevus: unilateral irregular pigmented hairy nevus appearing at adolescence.

Figure 5: Verrucous epidermal nevus in a13 yrs old boy

Figure 6: Giant congenital melanocytic nevus

Figure 7: Port-wine stain over face with multiple small nodules

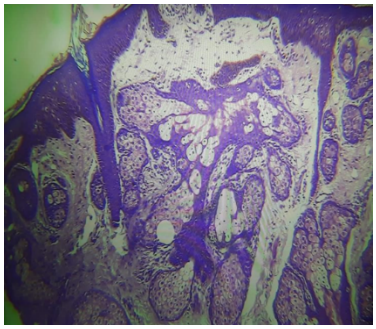

Figure 8: Histopathology of Nevus sebaceous with hematoxylin and eosin(H&E) Staining (x100)

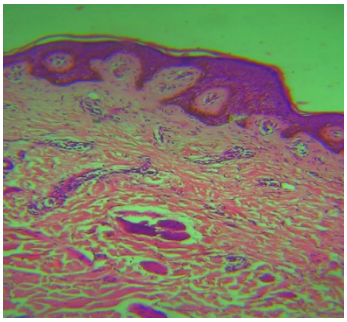

Figure 9: Histopathology of Becker's nevus with hematoxylin and eosin(H&E) Staining (x100)

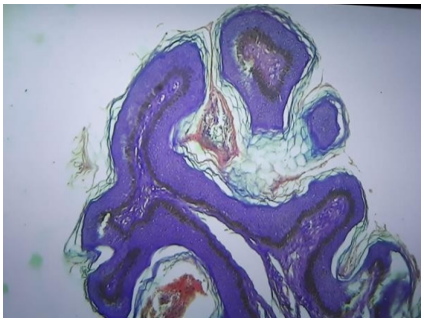

Figure 10: Histopathology of Verrucous epidermal nevus with hematoxylin and eosin(H&E)Staining (x40)

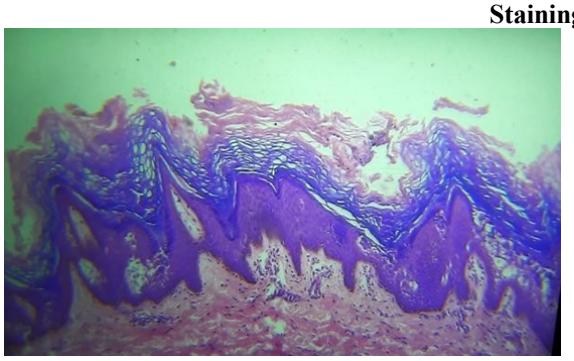

Figure 11: Histopathology of Inflammatory linear verrucous epidermal nevus with hematoxylin and eosin(H&E) Staining (x100)

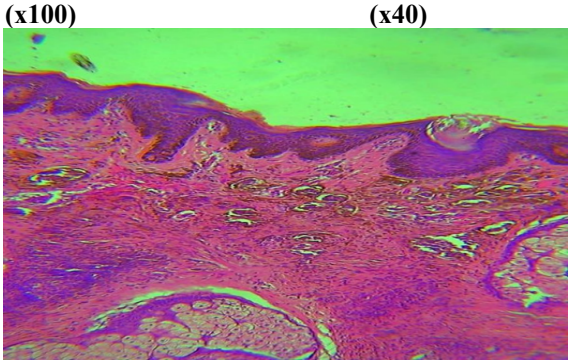

Figure 12: Histopathology of compound nevi with hematoxylin and eosin (H&E) Staining (x100)

Discussion

The present study evaluated the demographic and clinicopathological profile of nevi in 100 patients and demonstrated a clear predominance in the pediatric age group. In our cohort, 40% of patients belonged to the 1–10 years age group, and 56% of lesions were present at birth, indicating that a large proportion of nevi were congenital in origin. These findings emphasize the developmental nature of many cutaneous nevi. Similar observations were reported by Kinsler et al. [11], who documented that a substantial proportion of cutaneous nevi, particularly epidermal and melanocytic types, can be identified at birth or during early childhood. Likewise, Castilla et al. [12] reported that congenital nevi accounted for more than half of dermatological cases in pediatric populations, further supporting the concept that many nevi arise due to developmental anomalies occurring during embryogenesis.

In the present study, females constituted 52% of cases, while males accounted for 48%, and the difference was not statistically significant ($p = 0.68$). This observation is consistent with the

findings of Happle [13], who also reported no significant overall gender predilection in epidermal nevi. However, when individual types of nevi were analyzed separately, certain gender-related differences became evident. Becker's nevus showed a male predominance in our study, which is in agreement with the findings of Patrizi et al. [14], who suggested that this pattern may be related to increased androgen receptor sensitivity and hormonal influence during puberty. Conversely, Nevus of Ota demonstrated a significant female predominance in our study. Similar findings were reported by Hidano et al. [15], who observed a higher incidence of Nevus of Ota among females, possibly related to hormonal factors as well as increased cosmetic concern leading to higher consultation rates among women.

With regard to the distribution of different types of nevi, epidermal nevi constituted the largest group in our study, accounting for 48% of cases, followed by melanocytic nevi and dermal melanocytic lesions, which together comprised 31% of cases. These findings are comparable to those reported by Vidaurri-de la Cruz et al. [16], who also identified epidermal nevi as the most common subtype among pediatric patients.

However, a study conducted by Alper et al. [17] reported melanocytic nevi as the most frequent subtype, which may reflect differences in geographic location, genetic predisposition, or ethnic background among study populations. Hypomelanotic nevoid conditions and vascular nevi constituted smaller proportions of cases in our study.

This pattern is consistent with the observations of Frieden et al. [18], who reported that vascular nevi, such as infantile haemangiomas, represent a smaller fraction of congenital lesions encountered in dermatology outpatient settings. In terms of anatomical distribution, the present study showed a slight predominance of right-sided involvement (48%) compared with the left side (41%), while 11% of cases exhibited bilateral involvement. However, this difference was not statistically significant, indicating the absence of a clear lateral predilection. These findings are consistent with the observations of Moss et al. [19], who noted that many nevi follow patterns of cutaneous mosaicism or Blaschko's lines rather than demonstrating strict lateral dominance. Additionally, our study revealed a statistically significant association with higher socioeconomic status, with 66% of patients belonging to the Above Poverty Line (APL) group ($p = 0.003$). This may be explained by differences in healthcare accessibility and health-seeking behavior. Krengel et al. [20] similarly suggested that early dermatological consultation, diagnosis, and documentation of nevi are more common among individuals from urban and economically stable backgrounds. Overall, the findings of the present study are largely consistent with previously published literature regarding the congenital predominance of nevi, their higher occurrence in the pediatric age group, and the relative distribution of different subtypes. Minor variations observed in gender predilection and subtype frequency may be attributed to regional, genetic, environmental, and sociocultural factors.

These comparisons reinforce the understanding that most nevi are developmental lesions with diverse clinical presentations influenced by hormonal, genetic, and sociodemographic determinants.

Conclusion

The present study demonstrates that cutaneous nevi predominantly occur in the pediatric population, with more than half of the lesions being present at birth, thereby supporting their largely congenital origin. Epidermal nevi were identified as the most common subtype, followed by melanocytic nevi, suggesting that developmental abnormalities involving the epidermis and melanocytes account for the majority of cases.

Although the overall gender distribution was nearly equal between males and females, certain individual types of nevi exhibited significant gender predilection, indicating a possible role of hormonal or genetic factors in their development. No definite lateral predilection was observed in the distribution of lesions, which further supports the concept of mosaic patterns commonly seen in nevoid conditions.

The statistically significant association with higher socioeconomic status observed in the study likely reflects improved healthcare access, awareness, and reporting rather than an actual difference in disease prevalence. Overall, these findings highlight the importance of early identification, comprehensive clinical assessment, and regular follow-up—particularly in pediatric patients—to facilitate timely management and to monitor for potential complications or associated syndromic conditions.

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