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EXPLORING THE SPECTRUM OF PEDIATRIC DERMATOPATHOLOGICAL LESIONS AT TERTIARY CARE HOSPITAL

Pathology

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ABSTRACT

Skin diseases are a major problem in pediatric age and are associated with significant morbidity. Histopathological study of dermatopathological lesions is crucial for understating the type, complications and manifestations of disease as its gold standard for diagnosis and clinical diagnosis alone is often insignificant. This study aims to evaluate the spectrum of pediatric dermatopathological lesions at a tertiary care hospital, classifying them, observing associated morphological changes and clinical correlations. Conducted at JJ Hospital, Mumbai, over eighteen months, the study analyzed 60 skin biopsies from pediatric patients. The findings included a higher preponderance in females, with the most common age group is 13-18 years and maximum cases belonging to non-infectious papulosquamous category. Histopathological examination proved vital in confirming the exact diagnosis.

KEYWORDS

Pediatric, Dermatopathological, Clinical correlations, Skin Biopsy.

INTRODUCTION

Dermatologic disorders are seen throughout all stages of life. Depending upon age, sex, ethnicity and locality skin disorders vary widely. [1] Various lesions affecting skin range from nonspecific dermatosis and inflammatory diseases to neoplastic changes. [2] Skin diseases are a major problem in the pediatric age group and are associated with significant morbidity. Dermatological problems constitute at least 30% of all outpatient visits to a pediatrician and 30% of all visits to a dermatologist involve children. [3,4] Different studies from different parts of the country had recorded the prevalence of skin diseases amongst children in school surveys, mostly between 8.7% to 35%. [5] About 68.8% of skin conditions occurring in children can be physiological and 41.2% of the cases can be pathological. [6] The incidence of various dermatologic conditions varies according to geographic locations, climate, nutrition, hygiene, socio-economic conditions and heredity. [7] In many of these cases, a diagnosis can be made on clinical examination but for difficult cases a histological description and differential diagnosis are more useful than single "specific" diagnosis. [8] Histopathology is the gold standard for most of the dermatologic diagnosis. [9] Skin biopsy forms the basis of differential diagnosis in clinically similar dermatosis, thereby yielding important information to the dermatologist and pathologist. [10] The diagnosis offered by the histopathologist helps to confirm a diagnosis and in management of these disorders. [11] Early diagnosis of skin lesions by histopathological examination can prevent further infections, complications, better treatment, and early recovery. [12] When the histological picture is not diagnostic, clinicopathological correlation frequently makes diagnosis possible. Therefore, to obtain the precise diagnosis, skin biopsy should be accompanied by all the clinical details viz. history, site of biopsy, duration and morphology of lesions and clinical differential diagnosis. [13] In our study we aim to evaluate the spectrum of pediatric dermatopathological lesions in a tertiary care hospital. [14-15]

MATERIALS AND METHODS

This prospective observational study was conducted in Department of Pathology in JJ hospital Mumbai over a period of 18 months from September 2022 to February 2024 after institutional ethics clearance (IEC/989/2022). All the specimens of pediatric skin lesions received in the Department of Pathology within this defined study period are included in this study. We were able to enroll 60 patients in this study. Demographic data collection including age, gender, and socio-economic status was noted. Clinical examination was done for the patients. Provisional diagnosis of the patients and gross examination findings were noted down. Clinical data is obtained from hospital records and skin biopsies received in the department. Gross examination carried out on arrival in the department, routinely processed, 3-5 microns thick sections made from paraffin embedded blocks and stained with H and E and special stain whenever required. The various parameters assessed in the study included: Demographic details (age, gender), clinical examination findings, histopathological findings and relationship between clinical and histopathological diagnosis and clinicopathological agreement noted in study. Data Analysis: After data collection, data entry was done on a Microsoft Excel sheet. Results were displayed in tubular and graphical format.

RESULTS

In the present study, patients ranged from 0 years to 18 years. Maximum patients belong to the 13 -18 years age group, and the least number of patients belong to the 5-12 years age group.

Table 1: Age Wise Distribution Of Data

Age	Frequency	Percentage
0-4 years	00	00
5-12 years	21	35
13 – 18 years	39	65
Total cases	60	100

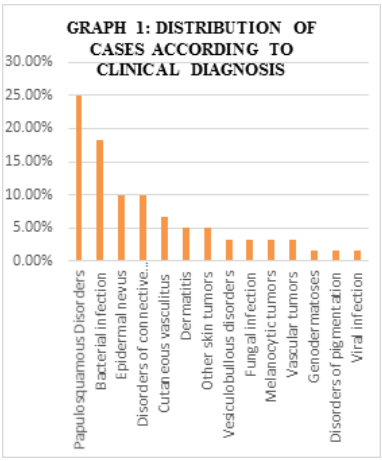
The study shows out of 60 patients, 32 (53.33%) patients were female and 28 (46.66%) were male. Female to male ratio is 1.14:1.

Table 2: Sex Wise Distribution Of Data

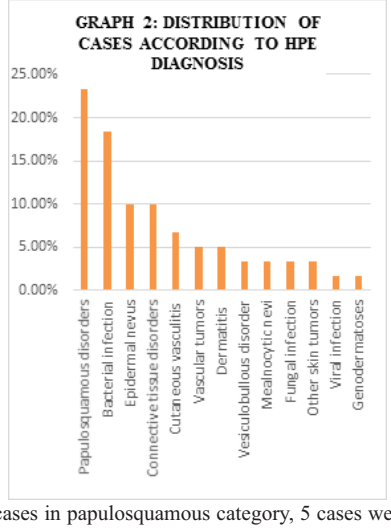
Sex	Frequency	Percentage
Male	28	46.66
Female	32	53.33
Total cases	60	100

According to clinical diagnosis, among the total of 60 cases, 33 cases (55%) belong to Non-infectious category, 14 cases (23.3%) belong to infectious category and 13 cases (21.6%) belong to neoplasms. Overall, Papulosquamous category (15 cases, 25%) constitute most cases in which lichen planus (5 cases each, 8.33%) was predominant followed by 4 cases of psoriasis, 2 cases of lichen planopilaris, and one case each of hypertrophic lichen planus, pityriasis rosea, prurigo nodularis and pityriasis lichenoides chronica. A total of 11 cases (18.33%) belong to Bacterial infections followed by 6 cases in Epidermal nevus category and disorders of connective tissue (11.66%). In Bacterial infection, leprosy comprises majority of cases (7 cases, 11.66%) followed by two cases of lupus vulgaris (3.33%), each case of Tuberculosis verrucosa cutis and impetigo (1.66%). In Epidermal nevus category, Beckers nevus was the most common comprising of 4 cases (6.66%) and one case each of linear verrucous epidermal nevus and nevus sebaceus (1.66%). In Disorders of connective tissue total 6 cases noted, 3 cases each of morphea and lichen sclerosus (5%). Total of 3 cases seen in Dermatitis category, comprising of each case of atopic dermatitis, chronic dermatitis and pityriasis alba. There were 4 cases of cutaneous vasculitis (6.66%), 2

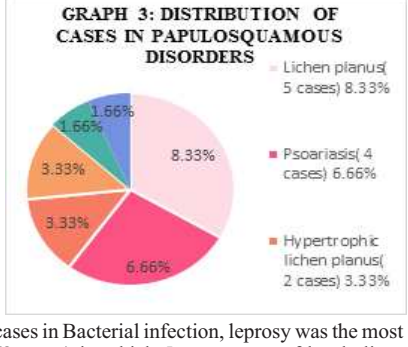
cases each of Linear IgA bullous disease, hemangioma, lichen planopilaris and melanocytic nevus (3.33%). Additionally, one case each of Icthyosis, vitiligo, epidermoid cyst, tuberculous panniculitis, molluscum contagiosum, pityariasis rosea, pityriasis versicolor, tinea capitis, dermatofibroma, fibrous papule of nose observed, constituting 1.66% each of all cases.



In the present study, according to histopathological examination maximum cases belong to Non-infectious disease category, consisting of 31 cases (51.6%), followed by infectious disease category (14 cases, 23.3%) followed by neoplasms (13 cases, 21.6%). In Non-infectious disease category, papulosquamous disorders were the most common (14 cases, 23.3%). The second common disease category was bacterial infection consisting of 11 cases (18.33%) followed by epidermal nevus and disorders of connective tissue consisting of 6 cases (10%) each.

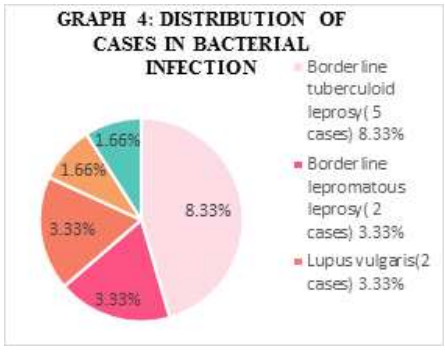


Out of 14 cases in papulosquamous category, 5 cases were of lichen planus (8.33% of total cases), followed by four cases in psoariasis (6.66%), two cases of hypertrophic lichen planus and prurigo nodularis (3.33%), one case each of pityriasis rosea (1.66%) and Pityriasis lichenoides chronica (1.66%).

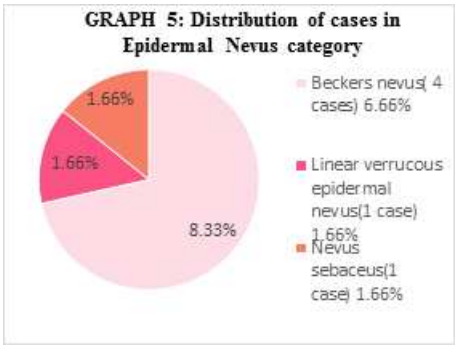


Out of 11 cases in Bacterial infection, leprosy was the most common infection (8 cases) in which 5 cases were of borderline tuberculoid leprosy (8.33%) followed by 2 cases of borderline lepromatous leprosy (3.33% of total cases), followed by one case of indeterminate leprosy.

There were two cases of lupus vulgaris (3.33%) and one case of impetigo (1.66%).



Out of 6 cases in Epidermal Nevus category, 4 cases were of Beckers nevus (6.66%), followed by one case of linear verrucous epidermal nevus and nevus sebaceus (1.66%) each.



In our present study, out of 60 cases, positive clinic-histopathological correlation was seen in 54 cases (90%), negative correlation in 4 cases (6.6%) and the histological findings were inconclusive in 2 cases (3.3%).

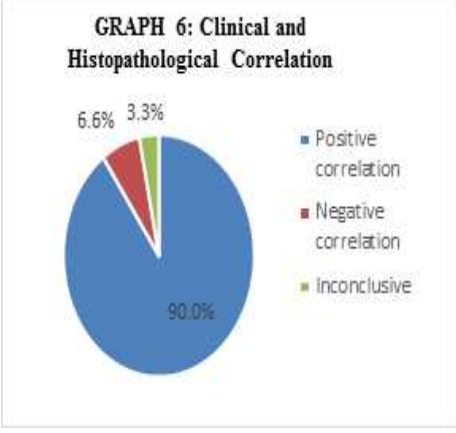


Table 3: Contribution Of Histopathology To The Diagnosis

DESCRIPTION	NO. OF CASES	PERCENTAGE
Histopathology confirmed the diagnosis	54	90
Histopathology gave the diagnosis	04	6.6
Histopathology noncontributory	02	3.3
TOTAL	60	100

Table 4: Cases where histopathology offered final diagnosis

CLINICAL DIAGNOSIS	NO. OF CASES	NEW SPECIFIC DIAGNOSIS ON HPR
Pityriasis alba	01	Borderline tuberculoid leprosy
Tuberculosis verrucosa cutis	01	Hypertrophic lichen planus
Vitiligo	01	Chronic dermatitis
Fibrous papule of nose	01	Lobular capillary hemangioma
TOTAL	04	----------

Study Images

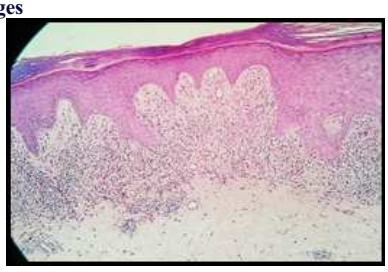


Image1: Lichen planus (H&E-stained section).

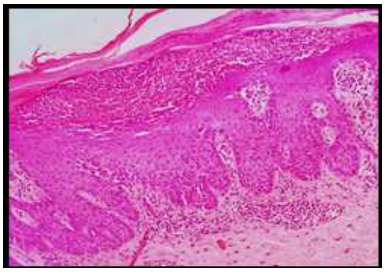


Image 2. Psoriasis (H & E-Stained section)

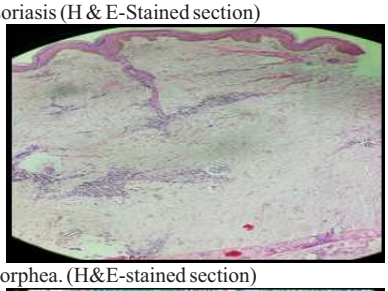


Image 3. Morphea. (H&E-stained section)

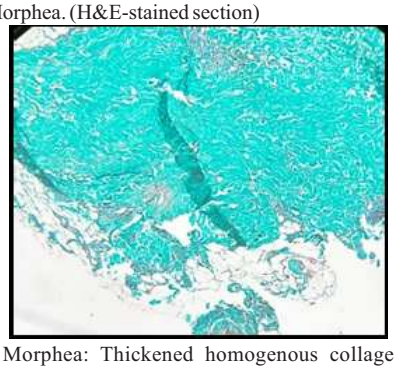


Image 4. Morphea: Thickened homogenous collagen (Masson trichome stained section)

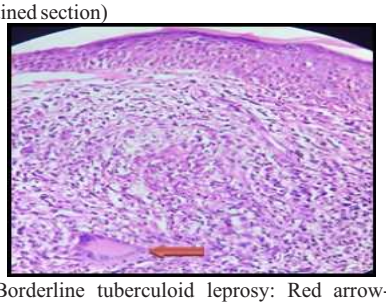


Image 5. Borderline tuberculoid leprosy: Red arrow- Langhans giant cell [H&E-stained section]

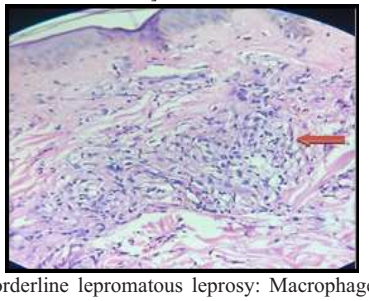


Image 6. Borderline lepromatous leprosy: Macrophage granuloma with many lymphocytes (red arrow) [H&E-stained section].

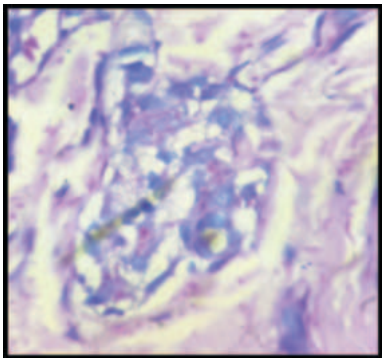


Image 7. Borderline lepromatous leprosy: Fite Faraco positive M. leprae in foamy macrophages around neurovascular bundle. [Fite Faraco stained section]

DISCUSSION:

Skin biopsy has a significant role in providing a definitive diagnosis for many pediatric dermatologic conditions. It is helpful in many lesions whose clinical diagnosis cannot be made or cases in which clinical features are like other dermatoses. Histopathological examination is used to diagnose skin lesions early and can help avoid complications, improve treatment outcomes, and prevent delayed healing. When the histological picture is not diagnostic, clinicopathological correlation frequently makes a diagnosis possible. In this study we tried to determine the common spectrum of skin disorders using histopathological diagnosis. We included children aged 0-18 years in the study.

Among the 60 participants included in the study, 65% were found to be aged between 13-18 years, and 35% between 5-12 years. This is very similar to the findings from Vishwanath et al., where nearly 55.2% of the individuals were aged 13-18 years and 31.4% between the ages 5-12 years.[16] Similarly, in the study by Shetageri et al., it was found that nearly half the participants (47.8%) belonged to the 12-18 years age group, 34.7% were of age 5-12 years, and 17.37 % were of age 0-4 years.[14] Similar findings were reported in a study by Ozankli et al. (0-2 years- 5.4%; 3-5 years-11.8%, 6-11 years- 29.1%, and 12–17 years-53.5%).[17]

In our study, there was a near-equal distribution of participants according to gender, with a slight preponderance of females (53.3%). A similar preponderance was evident in the study by Solanki et al., where 56% of the participants were women.[15] Similar findings were noted in studies by Shetageri et al. (53.9%), Reddy VS et al. (51.4%), and Tamer et al. (53%).[16,18,19] However, a few studies also reported a slight preponderance of males. These include studies by Vishwanath T et al. (55%), Grace et al. (57%), Ozkanli et al. (51%), Rana et al. (56%), and Sardana et al. (51%).[16,13,17,20,21]

In our study, according to histopathological examination maximum cases belong to Non-infectious disease category, consisting of 31 cases (51.6%), followed by infectious disease category (14 cases, 23.3%) followed by neoplasms (13 cases, 21.6%). In Non-infectious disease category, papulosquamous disorders (14 cases, 23.3%) were the most common consisting of 5 cases of lichen planus (8.33%) followed by 4 cases of psoriasis (6.66%), 2 cases of hypertrophic lichen planus (3.33%) and one case each of Pityriasis rosea, pityriasis lichenoides chronica and prurigo nodularis (1.66%). The second common disease category was bacterial infection consisting of 11 cases (18.33%) in which borderline tuberculoid leprosy was the most common (5 cases, 5%) followed by two cases of borderline lepromatous leprosy and lupus vulgaris (3.33%), followed by one case each of indeterminate leprosy and impetigo (1.66%). Disorders of connective tissue and Epidermal nevus category consists of 6 cases (10%). This pattern was similarly observed in other studies. In the study by Vishwanath et al., the pattern of diseases was papulosquamous, in which lichen planus was predominant followed by infections, in which borderline tuberculoid leprosy was predominant.[16] Similarly, Shetageri et al. found that nearly 31% of the participants were diagnosed with papulosquamous disorders with lichen planus being the most predominant followed by psoariasis.[16]. The study by Ozkanli et al. observed similar findings.[17] However, in some studies, the most common skin disorders were infectious. (Hayden et al., Grace et al, Solanki et al.)[22,14,17].

In our study, according to histopathological examination maximum cases belong to Non-infectious disease category, consisting of 31 cases (51.6%), followed by infectious disease category (14 cases, 23.3%) followed by neoplasms (13 cases, 21.6%). In Non-infectious disease category, papulosquamous disorders (14 cases, 23.3%) were the most common consisting of 5 cases of lichen planus (8.33%) followed by 4 cases of psoriasis (6.66%), 2 cases of hypertrophic lichen planus (3.33%) and one case each of Pityriasis rosea, pityriasis lichenoides chronica and prurigo nodularis (1.66%). The second common disease category was bacterial infection consisting of consisting of 11 cases (18.33%) in which borderline tuberculoid leprosy was the most common (5 cases, 5%) followed by two cases of borderline lepromatous leprosy and lupus vulgaris (3.33%), followed by one case each of indeterminate leprosy and impetigo (1.66%). Disorders of connective tissue and Epidermal nevus category consists of 6 cases (10%). This pattern was similarly observed in other studies. In the study by Vishwanath et al., the pattern of diseases was papulosquamous, in which lichen planus was predominant followed by infections, in which borderline tuberculoid leprosy was predominant. [16] Similarly, Shetageri et al. found that nearly 31% of the participants were diagnosed with papulosquamous disorders with lichen planus being the most predominant followed by psoariasis.[14]. The study by Ozkanli et al. observed similar findings. [17] However, in some studies, the most common skin disorders were infectious. (Hayden et al., Grace et al, Solanki et al.) [22,13,15]. Since most infections were treated on an outpatient basis and biopsies were only done when there was no significant improvement with medication, the number of such lesions in our study was considerably lower. In a study by Ruby et al., 67.5% of the cases were clinicopathologically consistent, and 32.5% were inconsistent.[23] In a similar study by Gupta et al., clinicopathological correlation was seen in 85.8% of cases, discordance in 9.1%, and non-conclusive histopathology in 5.1 %.[24] Similar correlations were seen in studies by Sa DK et al. (86.5%), Aslan et al. (76.8%), and Bin Yap et al. (92%).[25-27] However, in the study by Grace et al., positive correlation with the clinical diagnosis was obtained in 56.07% of cases. This difference could be attributed to the overlap of symptoms in many skin conditions, subjective interpretation of diagnosis by clinicians, or biopsy sampling error.[13]

In our present study, as far as the contribution of histopathology to the diagnosis was concerned, histopathology confirmed the diagnosis in maximum number of cases (54 cases out of 60 cases, 90%) and it gave the correct diagnosis in 4 cases, (6.6%) when there was no clinical suspicion of the disease and was non-contributory in 2 cases (3.3%) since histologic findings were non-specific. Thus, in a significant number of cases (58 cases out of 60 cases, 96.6%), histopathology contributed to the diagnosis.

Similarly, in a study conducted by Shetagiri et al, histopathology gave a confirmatory diagnosis in maximum number of cases 86.95%. Study by Grace et al had positive correlation with the clinical diagnosis in 56.07% of the cases while a new clinical diagnosis was given in 26.16% cases and non-contributory in 17.75% cases. They reported that histopathology contributed to the diagnosis in 82.23% which was like our study.

In our study, maximum histopathological correlation is seen in connective tissue disorders, cutaneous vasculitis, epidermal nevus, melanocytic nevus, vascular tumors, linear IgA bullous disease, fungal infections and viral infection (100%) followed by Bacterial infections (90.9%), papulosquamous disorders (86.6%), followed by dermatitis and other skin tumors (66.6%). It is the minimum in the disorders of pigmentation category (0%). One case of Ichthyosis which was diagnosed on clinical basis was reported as suggestive of Ichthyosis and clinical correlation was advised.

In a study conducted by Vishwanath et al, diagnostic agreement was maximum in vasculitis category (89.2%) and least in dermatitis (50%). Similarly, in the study by Aslan et al., the highest concordance was observed in connective tissue diseases (96.8%), followed by metabolic diseases.[26]

In the study by Prakash et al., the highest concordance was observed in genetic diseases (100%), followed by bullous diseases (79.1%), environmental diseases (73.3%), and inflammatory dermatoses (72%). [23] Similarly, in a study by Balasubramanian P et al., the correlation was observed at 59.8%, with maximum concordance observed among eczematous and lichenoid disorders. There was discordance in 30.9%.[28]

CONCLUSION:

Histopathology remains the gold standard for most of the dermatologic diagnosis, still it should be noted that not all lesions can provide a specific histologic diagnosis. However, in some cases, histopathology can still be valuable in excluding significant diagnoses even when a precise diagnosis cannot be established. The difficulty in making histologic diagnosis may be due to multiple reasons such as sampling errors: the biopsy sample may not adequately represent the entire lesion or may miss the critical area needed for diagnosis or due to inadequate clinical information. Following up and performing a repeat biopsy from a representative site could address this limitation. In challenging cases, effective communication between clinicians and pathologists, considering the clinical and epidemiological context of the lesion under study, can enhance diagnostic accuracy. Thus, effective patient management relies on a combination of strong clinical expertise and histopathological confirmation.

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