

**A Retrospective Analysis of Skin Biopsies Over One Year: Age, Sex Distribution, and Histopathological Patterns**Shri Nivash<sup>1</sup>, Nivedita Yadav<sup>2</sup><sup>1</sup>Assistant Professor, Department of Dermatology, Venereology and Leprosy, Narayan Medical College and Hospital, Jamuhar, Rohtas, Bihar, India<sup>2</sup>Assistant Professor, Department of Pathology, Narayan Medical College and Hospital, Jamuhar, Rohtas, Bihar, India

Received: 17-09-2025 / Revised: 21-10-2025 / Accepted: 25-11-2025

Corresponding Author: Dr. Nivedita Yadav

Conflict of interest: Nil

**Abstract:****Background:** Skin, the largest organ, is prone to diverse pathological conditions, ranging from benign to malignant, impacting health and quality of life. Histopathological examination of skin biopsies remains essential for accurate diagnosis.**Aim:** To retrospectively analyze the age, sex distribution, anatomical sites, and histopathological patterns of skin biopsies over one year.**Methodology:** This descriptive study included 153 skin biopsy specimens from patients of all ages and sexes at Narayan Medical College and Hospital, Sasaram, Bihar, India. Demographic data and biopsy findings were retrieved from departmental archives. Specimens underwent routine Hematoxylin and Eosin staining, with special stains and immunohistochemistry when required. Lesions were classified as non-malignant, granulomatous, or malignant.**Results:** The majority of patients were aged 21–40 years (male 37.8%, female 40.5%), with a slight female predominance (51.6%). The leg was the most common biopsy site (9.8%). Non-malignant lesions predominated (62.7%), with psoriasis (14.6%) most frequent. Granulomatous lesions (22.2%) were largely leprosy-related, while malignant lesions (15.1%) included basal cell carcinoma (30.4%) and squamous cell carcinoma (26.1%).**Conclusion:** Skin biopsies reveal a wide spectrum of dermatological conditions, predominantly non-malignant and granulomatous, with malignant lesions less frequently. Histopathology remains indispensable for accurate diagnosis, classification, and management of skin diseases.**Keywords:** Skin Biopsy, Histopathology, Age Distribution, Sex Distribution, Non-Malignant Lesions, Granulomatous Lesions, Malignant Lesions.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

The skin is a multifunctional and stratified cellular organ comprising of stratified cellular epidermis and underlying dermis, which consists of connective tissue, adnexal structures, blood vessels, nerves, immune cells and blood vessels [1]. It is the biggest organ of the human body, which comprises almost 15 percent of the total body weight and is the initial defense to physical, chemical and biological assaults. Besides acting as a protection, the skin also has a crucial role of thermoregulation, sensory, immune surveillance, and metabolic functions including the synthesis of vitamin D. Due to its large surface area and constant exposure to the environment, the skin is susceptible to a broad range of pathological conditions.

Skin disorders are considered to be the most widespread health issues on the global scale and impact people of all ages and both genders. These disorders are mild and self-limiting like xerosis, acne, and

severe inflammatory diseases, autoimmune diseases, severe blistering disorders as well as potentially fatal illnesses such as toxic epidermal necrolysis and cutaneous malignancies such as lymphomas and carcinomas [2]. Not life-threatening, many skin diseases are debilitating factors of life quality because of unremitting symptoms such as itch, pain, disfigurement, and appearance issues. Skin diseases have a significant psychological, social, and economic burden that tends to cause low self-esteem, isolation, and lower productivity.

The skin diseases can either be primary, which are disorders that occur inherent in the skin or secondary, which are symptoms of underlying systemic disorders. Vasculitis and connective tissue diseases, metabolic, infectious and internal malignancies are conditions which are often associated with cutaneous manifestation. Therefore, it is a window to what is happening inside the body, and the skin needs to

be carefully assessed in clinical practice. Although most dermatological diseases may be clinically diagnosed using morphological and topographical distribution of lesions, some disorders have overlapping clinical characteristics, and exact diagnosis is difficult.

A histopathological analysis is the best method in diagnosing and classifying many skin diseases [3]. Skin biopsy is a highly utilized diagnostic procedure in dermatopathology and is important in ensuring that clinical diagnoses are confirmed, the clinical diagnosis is eliminated, and the appropriate management is directed. The diagnosis of skin biopsies is based on systematic evaluation of epidermal, dermal and subcutaneous alterations and the determination of typical patterns of tissue reactions. The inflammation pattern, cellular infiltrates, structural changes, and the effects on the skin appendages are important diagnostic hints [4].

The principle of tissue reaction patterns is the basis of the dermatopathological diagnosis. The patterns are spongiotic and psoriasiform, lichenoid, vesiculobullous, granulomatous, vasculitic and neoplastic patterns, so on. These patterns can be identified to reduce these differential diagnoses and achieve correct classification of skin lesions. Histopathological findings are further correlated with clinical features, demographic data, and the distribution of the disease resulting in more accurate diagnosis.

The epidemiological study of the skin biopsies is also informative on the prevalence, age distribution, sex predilection, and histopathological spectrum of skin diseases in a given population. These studies are especially valuable in terms of knowing regional disease patterns, differences in how the disease is exhibited and burden of various dermatology diseases in a given healthcare facility. Retrospective examination of skin biopsy specimen also assists in evaluation of the diagnostic trends, determination of common and uncommon entities and assessing the utility of histopathology in daily practice of dermatology.

The trend of skin diseases is also not uniform in developing countries such as India because of the variation in climate, socioeconomic status, occupational exposure, hygiene, and access to healthcare services. Although the prevalence of skin disorders is high, there is very little published data on the histopathological spectrum of skin biopsies in many of the regions. Retrospective institutional studies thus become important in filling this gap of knowledge as well as making contributions in the literature of dermatopathology.

The current one-year retrospective research was conducted with the purpose of assessing the histomorphological range of skin biopsies presented to the histopathology department of nmch Sasaram in the period between one year. Archived records

contained the relevant patient history and demographic data, such as age and sex. The research aims at examining the distribution of skin lesions between various age groups and sexes and it will also compare the results with the pattern of histopathological results observed over the study period. The given analysis is likely to present the holistic picture of the burden and diversity of skin diseases faced during the routine practice of making diagnoses and to highlight why histopathology is being indispensable to dermatological diagnosis.

### Methodology

**Study Design:** This was a retrospective descriptive study conducted to analyze the age and sex distribution along with histopathological patterns of skin biopsies received over a period of one year.

**Study Area:** The study was carried out at the Department of Dermatology, Venereology and Leprosy, in collaboration with the Department of Pathology, Narayan Medical College and Hospital, Jamuhar, Rohtas, Bihar, India.

**Study Duration:** The study was conducted over a period of one year.

**Sample Size:** The total sample size included 153 skin biopsy specimens.

**Study Population:** The study population comprised patients of all age groups and both sexes who underwent skin biopsy for diagnostic purposes during the study period at Narayan Medical College and Hospital.

**Data Collection:** Data for the present study were collected retrospectively from the records maintained in the Department of Histopathology at Narayan Medical College and Hospital. Demographic details including age and sex of the patients, along with clinical information such as anatomical site of the lesion and provisional clinical diagnosis, were obtained from biopsy requisition forms and departmental archives. All skin biopsy specimens included in the study had been fixed in 10% formalin for a duration of 24 hours, followed by routine tissue processing. Paraffin-embedded tissue blocks were prepared, from which 3–4  $\mu\text{m}$  thick sections were cut and stained with Hematoxylin and Eosin for histopathological evaluation. Special stains such as Periodic Acid-Schiff and Acid-Fast Bacilli staining were performed in selected cases wherever required. Immunohistochemistry was utilized when necessary to aid in establishing a definitive diagnosis.

### Inclusion Criteria

- All skin biopsy specimens received during the study period
- Biopsies with adequate tissue for histopathological evaluation
- Patients of all ages and both sexes

### Exclusion Criteria

- Inadequately preserved or poorly fixed biopsy specimens
- Biopsies with insufficient tissue for diagnosis
- Repeat biopsies from the same lesion

**Procedure:** All cases were reviewed and categorized based on age, sex, and histopathological findings. Patients were divided into five age groups: 0–20 years, 21–40 years, 41–60 years, 61–80 years, and above 80 years. Histopathological diagnoses were analyzed and classified into non-malignant, granulomatous, and malignant skin diseases. The distribution of lesions was studied with respect to age and sex to identify prevalent patterns. The compiled data were then systematically tabulated for further analysis and interpretation.

**Statistical Analysis:** Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Descriptive statistics were used to calculate frequencies and percentages. Results were

presented in the form of tables and charts for clarity. No inferential statistical tests were applied, as the study was descriptive in nature.”

### Result

Table 1 presents the demographic distribution of 153 patients according to age and sex. The majority of patients were in the 21–40 years age group, comprising 28 males (37.8%) and 32 females (40.5%), making it the most affected age group in both sexes. This was followed by the 41–60 years group with 25 males (33.8%) and 26 females (32.9%). Patients aged 0–20 years accounted for 9 males (12.2%) and 10 females (12.7%). The 61–80 years age group included 10 males (13.5%) and 9 females (11.4%), while patients aged above 80 years constituted the smallest proportion, with 2 males (2.7%) and 2 females (2.5%). Overall, there was a slight female predominance, with 79 females (51.6%) compared to 74 males (48.4%).

**Table 1: Showing demographic data of patients (N = 153)**

Age group (years)	Male	Percentage	Female	Percentage
0–20	9	12.2	10	12.7
21–40	28	37.8	32	40.5
41–60	25	33.8	26	32.9
61–80	10	13.5	9	11.4
>80	2	2.7	2	2.5
<b>Total</b>	<b>74</b>	<b>48.4</b>	<b>79</b>	<b>51.6</b>

Table 2 depicts the distribution of biopsy sites among 153 cases. The leg was the most common site, accounting for 15 cases (9.8%), followed by the back with 13 cases (8.5%) and the scalp with 11 cases (7.2%). Biopsies from the forehead (10 cases, 6.5%) and temporal region (9 cases, 5.9%) were also frequently observed. The chest wall (8 cases, 5.2%) and neck (7 cases, 4.6%) contributed a moderate proportion of cases. The cheek and upper limb each

accounted for 6 cases (3.9%), while the lower limb excluding the leg comprised 5 cases (3.3%). Less commonly involved sites included the abdomen and axilla with 4 cases each (2.6%), and the gluteal and genital regions with 3 cases each (2%). A substantial proportion of biopsies were obtained from other sites, totaling 49 cases (32%), indicating a wide anatomical distribution of skin lesions.

**Table 2: Showing distribution of biopsy sites (N = 153)**

Site	No. of cases	Percentage
Leg	15	9.8
Back	13	8.5
Scalp	11	7.2
Forehead	10	6.5
Temporal region	9	5.9
Chest wall	8	5.2
Neck	7	4.6
Cheek	6	3.9
Upper limb	6	3.9
Lower limb (excluding leg)	5	3.3
Abdomen	4	2.6
Axilla	4	2.6
Gluteal region	3	2
Genital region	3	2
Other sites	49	32
<b>Total</b>	<b>153</b>	<b>100</b>

Table 3 shows the distribution of histopathological categories among 153 cases. Non-malignant lesions formed the majority, comprising 96 cases (62.7%), indicating that benign conditions were the most frequently encountered. This was followed by

granulomatous lesions, which accounted for 34 cases (22.2%). Malignant lesions were the least common, with 23 cases (15.1%). Overall, the table highlights a clear predominance of non-malignant skin lesions in the studied population.

Category	No. of cases	Percentage
Non-malignant lesions	96	62.7
Granulomatous lesions	34	22.2
Malignant lesions	23	15.1
<b>Total</b>	<b>153</b>	<b>100</b>

Table 4 illustrates the distribution of malignant skin lesions among 23 cases. Basal cell carcinoma was the most common malignancy, accounting for 7 cases (30.4%), with a slight female predominance (4 females, 3 males). This was followed by squamous cell carcinoma, seen in 6 cases (26.1%), occurring more frequently in males (4 males, 2 females). Malignant melanoma constituted 4 cases (17.4%), with

a marked male predominance (3 males, 1 female). Sebaceous carcinoma and lymphoma each accounted for 3 cases (13%), both showing a higher female representation (2 females and 1 male each). Overall, malignant skin lesions showed a nearly equal gender distribution, with 12 males and 11 females affected.

Malignancy	No. of cases	Percentage	Male	Female
Basal cell carcinoma	7	30.4	3	4
Squamous cell carcinoma	6	26.1	4	2
Malignant melanoma	4	17.4	3	1
Sebaceous carcinoma	3	13	1	2
Lymphoma	3	13	1	2
<b>Total</b>	<b>23</b>	<b>100</b>	<b>12</b>	<b>11</b>

Table 5 shows the distribution of granulomatous skin lesions among 34 cases. The most common lesion was borderline tuberculoid leprosy, accounting for 13 cases (38.2%), with a male predominance (8 males, 5 females). This was followed by tuberculoid leprosy seen in 11 cases (32.4%), with an almost equal sex distribution (6 males, 5 females). Lupus

vulgaris constituted 6 cases (17.6%), occurring more frequently in females (4 females, 2 males). The least common lesion was lepromatous leprosy (LL), observed in 4 cases (11.8%), predominantly among males (3 males, 1 female). Overall, males (19 cases) were more commonly affected than females (15 cases).

Type of lesion	No. of cases	Percentage	Male	Female
Borderline tuberculoid leprosy	13	38.2	8	5
Tuberculoid leprosy	11	32.4	6	5
Lupus vulgaris	6	17.6	2	4
Leprosy (LL)	4	11.8	3	1
<b>Total</b>	<b>34</b>	<b>100</b>	<b>19</b>	<b>15</b>

Table 6 depicts the distribution of non-malignant skin lesions among 96 cases. Psoriasis was the most common lesion, accounting for 14 cases (14.6%), followed closely by dermoid cysts with 13 cases (13.5%) and viral warts seen in 11 cases (11.5%). Seborrhic dermatitis constituted 10 cases (10.4%), while neurofibroma and fibroma accounted for 8 (8.3%) and 7 cases (7.3%), respectively.

Trichilemmal cysts and keloids were observed in 6 cases each (6.3%). Capillary hemangioma and pilomatixoma contributed 5 cases each (5.2%), whereas fibroepithelial polyps were seen in 4 cases (4.2%). The remaining 7 cases (7.2%) comprised other non-malignant lesions, reflecting a wide spectrum of benign dermatological conditions.

**Table 6: Showing distribution of non-malignant skin lesions (n = 96)**

Type of lesion	No. of cases	Percentage
Psoriasis	14	14.6
Dermoid cyst	13	13.5
Viral warts	11	11.5
Seborrheic dermatitis	10	10.4
Neurofibroma	8	8.3
Fibroma	7	7.3
Trichilemmal cyst	6	6.3
Keloid	6	6.3
Capillary hemangioma	5	5.2
Pilomatrixoma	5	5.2
Fibroepithelial polyp	4	4.2
Others	7	7.2
<b>Total</b>	<b>96</b>	<b>100</b>

### Discussion

A total of 153 patients were exposed to skin biopsy in the course of 1 year in the present study with a female bias of 51.6: 48.4 respectively. The age group 21-40 years recorded the highest number of cases with 37.8 of the males and 40.5 of the females with the next highest being the 41-60 years group with 33.8 and 32.9 respectively. In the extremes of age, there were smaller cases of cases with patients older than 80 years, 2.7 percent men and 2.5 percent women. These are in line with various other studies which have indicated a generalization of dermatological conditions among the young and middle-aged adult population. As an example, D'Costa et al. and Rajput et al. also provided the reports that the majority of patients lied within the 30 -40-year age bracket, which indicates that skin pathologies very often appear during the most economically productive years (Rajput et al., 2014; Singh et al., 2012) [5,6]. On the contrary, the age distribution in Jha et al. showed the highest incidence somewhat earlier, with the 21-30-year age group, which suggests that there is some regional or demographic difference in the age distribution (Piyush & Bharti, 2016) [7]. Remarkably, although our study indicated a little female superiority, research by R. Singh et al., Dhar et al., and Bal et al. indicated the male dominance between 54% and 56% respectively indicating that there may be some disparities in healthcare seeking habits, occupational exposure or cultural factor affecting the rate of biopsy (Singh et al., 2012; Dhar, 2002; Bal et al., 2006) [6,8,9]."

As to the anatomical distribution, the leg was found to be the most frequent biopsy location (9.8%), next was the back (8.5%), and scalp (7.2%). The trend of this is associated with other retrospective studies, even though a number of studies differ in the prevalence of individual locations. The lower extremity participation rate in our study could indicate the prevalence of traumatic lesions or ulcerative lesions in these regions whereas the presence of the scalp

and back could be caused by chronic inflammatory or neoplastic disease.

The results of histopathological analysis showed that non-malignant lesions were the most frequent (62.7%), granulomatous lesions 22.2 and malignant lesions 15.1. These results can be compared to other works which have continuously shown non-malignant lesions as the most frequent category, with psoriasis often as the most common non-malignant lesion. Psoriasis was the most common lesion in our study, and the prevalence rate was 14.6%. Dermoid cysts (13.5%) and viral warts (11.5) came next. Similar results were noted by Alexander et al. and Yang et al. who identified psoriasis as the most frequent non-malignant skin lesion, but their prevalence was between 610% which was lower than in our cohort (Alexander et al., 2001; Yang et al., 2005) [10,11]. It was also noted by Mohd Yunus et al. that 4.5% of the cases had psoriasis which was variable and is probably due to regional differences, population size and referral patterns (Younas & Haque, 2004) [12]. The fact that psoriasis has been the most common cause of skin biopsy in our study reinforces its relevance in the same aspect, particularly in adult populations.

In this study, granulomatous lesions were mostly due to leprosy, with borderline tuberculoid (BT) leprosy taking 38.2% of the percentage, then tuberculoid leprosy (32.4), lupus vulgaris (17.6), and lepromatous leprosy (11.8). The granulomatous lesions showed some slight male preponderance (19 males vs. 15 females), which is in accordance with the results by Dhar et al. and Bal et al., who also reported male preponderance in infectious granulomatous dermatoses (Dhar, 2002; Bal et al., 2006) [8,9]. Suri et al. reported that BT leprosy was the most frequent among the subtypes, with 42% cases, and it is rather clear that the trend could be observed locally (Suri et al., 2014) [13]. Nevertheless, Veldurthy et al. showed an opposite picture, with the most common type of granulomatous lesion being lichenoid lesions and the next being the Hansen disease and so lesion

patterns may differ depending on geographical and demographic factors (Veldurthy et al., 2015) [14].

The most common malignant lesion was basal cell carcinoma (BCC), 30.4 percent of which were malignancies, then squamous cell carcinoma (26.1), then malignant melanoma (17.4), and sebaceous carcinoma and lymphoma (13 each). There was some male preponderance over malignant cases, but this was slight. These findings are largely in agreement with the findings on a global basis, as in most cases BCC remains the most common cutaneous malignancy, however, other studies have shown that in certain high sun exposure populations, SCC is dominating in the BCC. The dominance of malignancies in males is consistent with the previous literature and can be predetermined by work exposure to the sun and personal lifestyle.

Ages distribution of the lesions also portrays similar trends that have been reported in other reports with non-malignant lesions especially the psoriasis and dermoid cysts being more common among young adults whereas the malignancies are more common in various older age groups. This finding aligns with the accumulated effects of environmental exposures, persistent inflammation and immune senescence in elderly people, which cause carcinogenesis in the long run. In relative terms, research works by Mehar et al., and Singh et al. support the findings of similar epidemiological trends and point to the fact that the burden of non-malignant and granulomatous lesions is the most critical problem in adults between 20 and 40 years of age (Rakesh et al., 2014; Singh et al., 2012) [15,6].

In general, our research can be compared with the regional and international literature in terms of similar tendencies based on sex distribution, affected age groups, anatomical locations, and lesion types. Minor differences, including female predominance and prevalence of psoriasis, could be caused by local demographics, access to health care and referral bias. The regular prevalence of non-malignant lesions highlights the need to be able to identify and treat them at an early stage, and the presence of granulomatous conditions in great numbers highlights the importance of the infectious dermatology issues that remain relevant in our area. Moreover, the trend of malignant lesions demonstrates the necessity of continuing monitoring and histopathological verification, in particular, sun-exposed parts that are subject to carcinogenesis.

### Conclusion

This cross-sectional survey of skin biopsies in a period of one year points out to a wide range of dermatological diseases among the varied age groups with slight female preponderance and majority of cases in the early and middle adulthood. Biopsies were made of diverse anatomical locations, and this was based on the diversity of clinical presentation of skin

lesions that are encountered in normal practice. Histopathological analysis showed that most of the lesions were non-malignant and this proves that biopsy plays a crucial role in diagnosing non-malignant but clinically significant lesions. Granulomatous lesions formed a substantial proportion, with leprosy-related pathology being a prominent finding, underscoring the continued relevance of infectious dermatoses in the study population. Malignant lesions, though less frequent, showed diverse histological types, reinforcing the critical role of histopathology in accurate diagnosis and management. Overall, the study demonstrates that skin biopsy remains an indispensable diagnostic tool, aiding in the precise classification of cutaneous lesions and guiding appropriate clinical decision-making.

### References

1. Montagna W, Parakkal PF. The structure and function of skin. 3rd edition, New York: Springer, 1992.
2. Burns DA, Cox NH. Introduction and Historical Bibliography. Rook's Textbook of Dermatology. 7th edition, Blackwell Science, 2004.
3. Goyal N, Jain P, Malik R, Koshti A. Spectrum of non-neoplastic skin diseases: a histopathology based clinicopathological correlation study. *Sch J App Med Sci* 2015;3(1F):444-9.
4. D' Costa G, Bharambe BM. Spectrum of non-infectious erythematous, papular and squamous lesions of the skin. *Indian J Dermatol* 2010; 55:225-8. 3.
5. Rajput JS, Singh K, Singh S. Clinicopathological study of nonneoplastic skin disorder. *Med Plus Int Med J* 2014;1(8):367-72.
6. R Singh, K Bharathi, R Bhat, C Udayashankar. The Histopathological Profile Of Non-Neoplastic Dermatological Disorders with Special Reference To Granulomatous Lesions - Study At A Tertiary Care Centre In Pondicherry, *Internet journal of Pathology*, 2012;13(3).
7. Piyush G Vaghela, Bharti M Jha. Histomorphological analysis of nonneoplastic skin lesions *International Journal of Medical Science and Public Health* 2016;5(4).
8. Dhar S; Dhar S. Histopathological features of granulomatous skin diseases: an analysis of 22 skin biopsies *Indian J Dermatol* 2002; 47:88-90.
9. Bal A, Mohan H, Dhama GP. Infectious granulomatous dermatitis: a clinico pathological study. *Indian J Dermatol* 2006; 51:217-20.
10. Alexander E, Pinto J, Pai GS, Kamath N, Kuruvilla M. Disease concomitance in psoriasis: a clinical study of 61 cases. *Indian J Dermatol Venereol Leprol* 2001; 67:66-8.
11. Yang Y, Koh D, Khoo L, Nyunt SZ, Ng V, Goh CL, et al. The psoriasis disability index in Chinese patients: contribution of clinical and psychological variables. *Int J Dermatol* 2005; 44:925-9.

12. Younas M, Haque A. Spectrum of Histopathological Features in Non-Infectious Erythematous and Papulosquamous Diseases. *International Journal of Pathology* 2004; 2:24-30
13. Suri SK, Iyer RR, Patel DU, Bandil S, Baxi S. Histopathology and clinico-histopathological correlation in Hansen's disease. *J Res Med Den Sci* 2014;2(1):37-44.
14. Veldurthy VS et al *International Journal of Research in Medical Sciences*. Int J Res Med Sci. 2015 Aug;3(8): 1985-1988.
15. Rakesh Mehar, Ravi Jain, CV Kulkarni, Sanjeev Narang, Meena Mittal, Harshul Patidar. Histopathological Study of Dermatological Lesions – A Retrospective Approach. *International Journal of Medical Science and Public Health* 2014;3(9):1082-1085.