ORIGINAL RESEARCH

Spectrum of histopathological changes of skin biopsies in a tertiary care hospital

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Received: 10 February, 2023 Accepted: 15 March, 2023

ABSTRACT

Background: The prevalence of Skin disorders is towards the higher trend in developing countries, this makes them to be one of the most common health problems of India. There has been a high variability in histological spectrum observed. The histological diagnosis plays an important part in the treatment of the disease by the clinicians. **Aim & Objectives:** The study is aimed to study the spectrum of histopathological changes in skin biopsies. The objective of this study is to describe the morphological features in various skin diseases and to classify the skin lesions according to benign and malignant pathology. **Methodology:** A descriptive study done among patients with skin lesions from January 2022 to January 2023. The relevant clinical details were collected and analyzed for 216 patients. The different morphological patterns of the skin biopsies were described and categorised. **Results:** There was a slight preponderance in the occurrence of skin disease in males (54.6%) compared to females (45.4%). The most common site of the skin lesion was found to be the limbs (63.9%), with 46.37% in upper extremities and 53.62 in lower extremities. The most commonly observed skin disease were Non-infectious erythematous papular and squamous diseases 82(38%) and Non-infectious vesiculobullous and vesiculopustular diseases 44(20.4%) this was followed by 20(9.3%) of Neoplastic disease of skin and 18(8.3%) Microbial disease of skin. **Conclusion:** Morphological variations needs to be ascertained to arrive at a good diagnosis for improving the quality of life of patients with skin ailments.

Key words: Skin disorder, dermatitis, lichen planus, psoriasis, basal cell carcinoma, spongiotic dermatitis

INTRODUCTION

The skin is considered the largest organ of the body, which accounts 15% of total body weight in adults. The basic functions of skin are protection against the physical, chemical and biological agents in addition to thermoregulation and prevention of excessive water loss. Skin is composed of three layers-outer epidermis, dermis and the inner subcutaneous tissue. While the keratinocytes are present in the epidermis, the dermis composes of collagen and adipocytes in the subcutaneous tissue[1,2]. The skin diseases are the 4th leading cause of global nonfatal disease burden, these varies with region and condition as the burden of infectious skin condition is more prevalent in poor area, while the rich areas shoulder the burden of malignancies[3]. With their high prevalence and morbidity over common conditions like dermatitis, urticaria and the high cost of novel treatment for chronic inflammatory diseases like psoriasis, there is been an economic threat to the health care system observed. This is likely to worsen theaveragelife expectancy of the population[4]. It is said that 1.3% of the patients attending the dermatology clinic would require a skin biopsy for accurate diagnosis, to evaluate therapy and assess the prognosis. Thus clinical along with the histopathological data is essential for proper diagnosis of several skin disorders[5].

AIM AND OBJECTIVES

The study is aimed to study the spectrum of histopathological changes in skin biopsies. The objective of this study is to describe the morphological features in various skin diseases and to classify the skin lesions according to benign and malignant pathology.

MATERIALS AND METHODS

A descriptive observational study was done among patients presenting with skin lesions to a tertiary care hospital in Trichy. The study period is from January 2022 to January 2023. The data regarding the clinical features of all the patients who underwent skin biopsies from the period of January 2022 to January 2023 was collected during this interval. Skin biopsies without significant skin changes and skin biopsy from other departments were excluded from the study. Thus a total of 216 biopsies were included in our study. The histopathology reports of the skin biopsies were collected and different morphological patterns of the skin biopsies were described and categorised.

The study was started after obtaining approval from the institutional ethical committee. The purpose of the study was clearly explained to the patients and an informed written consent was obtained before including them in the study. The confidentiality of the data was maintained and the right to withdraw from the study without any loss or penalty was explained to the patient. The data collected was entered in MS excel and analysis was done using SPSS software version 23. The frequency distribution of the benign and malignant lesion was analysed along with the age and gender association.

RESULTS

Of the 216 study participants, there was a slight preponderance in the occurrence of skin disease in males 118(54.6%) compared to females 98(45.4%). Majority 127(58.9%) of the study participants belonged to 20-50 years of age. Only 9(4.2%) and 15(6.9%) were aged 5-10 years and >71 years respectively.

The most common site of the skin lesion was found to be the limbs (63.9%), with 46.37% in upper extremities and 53.62 in lower extremities. This was followed by 23.1% of lesion in the trunk region with distribution of 20% and 80% in the anterior and posterior region respectively. The most commonly observed skin disease was Non-infectious erythematouspapular and squamous diseases 82(38%) andNon-infectious vesiculobullous and vesiculopustular diseases 44(20.4%). This was followed by 20(9.3%) of Neoplastic disease of skin and 18(8.3%)Microbial disease of skin. The most common diagnosis in Non-infectious erythematous papular and squamous diseases were 15(6.9%) cases of lichen planus,12(5.6%)cases of psoriasi form dermatitis and 10(4.6%) cases of Psoriasis vulgaris. In Non-infectious vesiculobullous and vesiculopustular diseases24(9.2%)cases of spongiotic dermatitis. In 20 (9.3%) cases of Neoplastic diseases, 2 (0.9%) cases were malignant condition rest of them were benign. The other cases diagnosed were feeble in number and is mentioned in the tables.

Most of the non-infectious erythematous papular and squamous diseases and Non-infectious vesicobullous and vesicopustular diseases were distributed over the limbs 58(70.73%)and 29(65.90%) followed by 21(25.61%)and 13(29.54%) over the trunk respectively. While considering the neoplastic diseases the major distribution was over the head and neck 10(50%) followed by limbs 8(40%). The microbial disease was commonly distributed over the limbs 8(44.44%) followed by trunk 7(38.89%). 7(77.78%) of vascular disease was seen over the limbs, 6(60%) and 3(30%) of connective tissue disease were seen over limbs and head and neck respectively.

Table 1: Frequency Distribution of Site of Lesion

Site of lesion			**Frequency N(%)**
Trunk 50(23.1%)	Back40(18.5%)	Upper back	22(10.2)
		Mid and lower back	14(6.5)
		Shoulder	4(1.9)
	Chest and abdomen10(4.6%)	Chest	2(0.9)
		Abdomen	5(2.3)
		Scrotal and inguinal region	3(1.4)
Head and neck 28(13%)	Head and neck 28(13%)	Scalp	10(4.6)
		Forehead	2(0.9)
		Eyes	2(0.9)
		Ears	2(0.9)
		Nose	2(0.9)
		Lips	1(0.5)
		Cheek	4(1.9)
		Chin	1(0.5)
		Temple	2(0.9)
		Neck	2(0.9)
Limbs 138(63.9%)	Upper extremities 64(29.6%)	Axilla and Arm	18(8.3)
		Elbow	3(1.4)
		Forearm and wrist	38(17.6)
		Hand and digits	5(2.3)

	Lower extremities 74(34.3%)	Thigh	16(7.4)
		Knee	6(2.8)
		Leg	45(20.8)
		Foot and digits	7(3.2)

Table 2: Frequency Distribution of Morphological Pattern of skin Biopsy

Morphological pattern of skin biopsies		**Frequency N(%)**	
Non-infectious erythematous popular and squamous diseases	Lichen Planus	15(6.9)	82(38)
	Psoriasiform Dermatitis	12(5.6)	
	Psoriasis vulgaris	10(4.6)	
	Pityriasis Rubra Pilaris	7(3.2)	
	Prurigo Nodularis	6(2.8)	
	Lichen Nitidus	3(1.4)	
	Lichenoid Dermatitis	3(1.4)	
	Actinic Lichen Planus	2(0.9)	
	Ashy Dermatosis	2(0.9)	
	Erythema annulare centrifugum	2(0.9)	
	Granuloma Annularae	2(0.9)	
	Hypertrophic Lichen Planus	2(0.9)	
	Psoriasis	2(0.9)	
	Atopic Dermatitis	1(0.5)	
	Atrophic Lichen Planus	1(0.5)	
	Dermal Hypersensitivity Reaction	1(0.5)	
	Exfoliative dermatitis	1(0.5)	
	Follicular Lichen Planus	1(0.5)	
	Lichen Planopilaris	1(0.5)	
	Lichen Spirulosus	1(0.5)	
	Parapsoriasis	1(0.5)	
	Pityriasis Alba	1(0.5)	
	Pityriasis lichenoides chronica	1(0.5)	
	Pityriasis Rosea	1(0.5)	
	Poikiloderma	1(0.5)	
	Prurigo Simplex	1(0.5)	
	Non-specific Dermatitis	1(0.5)	
Non-infectious vesiculobullous and vesiculopustular diseases	Spongiotic Dermatitis	24(9.2)	44(20.4)
	Bullous pemphigoid	7(3.2)	
	Pemphigus Vulgaris	8(3.7)	
	Linear IgA Bullous Dermatosis	2(0.9)	
	Epidermolysis bullosa	2(0.9)	
	Intraepidermal Bullous Disorder	1(0.5)	
Neoplastic disease of skin	Tumors of epidermis	7(3.2)	20(9.3)
	Tumors of Dermis	3(1.4)	
	Pigmented benign lesion	3(1.4)	
	Neural Tumours	2(0.9)	
	Vascular Tumours	2(0.9)	
	Tumors of epidermal appendages	3(1.4)	
Microbial disease of skin	Bacterial Diseases	17(7.9)	19(8.8)
	Fungal Disease	2(0.9)	
Connective tissue disease	Lichen sclerosis Et Atrophicus	3(1.4)	10(4.6)
	Morphea	4(1.9)	
	Lupus Erythematosus	3(1.4)	
Vascular disease of skin	Vascular diseases of skin	4(1.9)	9(4.2)
	Small vessel vasculitis	3(1.4)	
	Pyoderma Gangrenosum	1(0.5)	
	Neutrophilic Dermatoses	1(0.5)	
Cutaneous Deposits	Amyloidosis	6(2.8)	6(2.8)
Disease of Cutaneous appendages-Alopecia Areta		4(1.9)	4(1.9)
Genodermatoses	Grover's Disease	1(0.5)	3(1.4)

	Porokeratosis	1(0.5)	
	Lipoid Proteinosis	1(0.5)	
Metabolic storage disease-Diabetic Dermopathy		1(0.5)	1(0.5)
Miscellaneous condition	Ulcer with Granulation tissue formation	4(1.9)	18(8.3)
	Post-inflammatory pigmentary alteration	7(3,2)	
	Granulomatous Inflammation	1(0.5)	
	Epidermal atrophy	1(0.5)	
	Palmoplantar Keratoderma	1(0.5)	
	Toxic Epidermal Necrolysis	1(0.5)	
	Nevus Lipomatous Superficialis	1(0.5)	
	Confluent and reticulated papillamatosis	1(0.5)	
	Non-specific ulcer	1(0.5)	

Table 3: Site wise distribution of skin diseases

Histomorphology of skin disease	**Location N(%)**		
	Trunk	**Head and neck**	**Limbs**
Vascular disease of skin	1(11.11)	1(11.11)	7(77.78)
Metabolic storage disease	0	0	1(100)
Disease of Cutaneous appendages	0	4(100)	0
Connective tissue disease	1(10)	3(30)	6(60)
Microbial disease of skin	7(36.84)	4(21.05)	8(42.11)
Neoplastic disease of skin	2(10)	10(50)	8(40)
Non-infectious erythematous papular and squamous diseases	21(25.60)	3(3.67)	58(70.73)
Non-infectious vesicobullous and vesicopustular diseases	13(29.55)	2(4.55)	29(65.90)
Cutaneous Deposits	1(14.28)	0	6(85.72)
Genodermatoses	1(50)	0	1(50)
Miscellaneous condition	3(16.67)	1(5.56)	14(77.77)

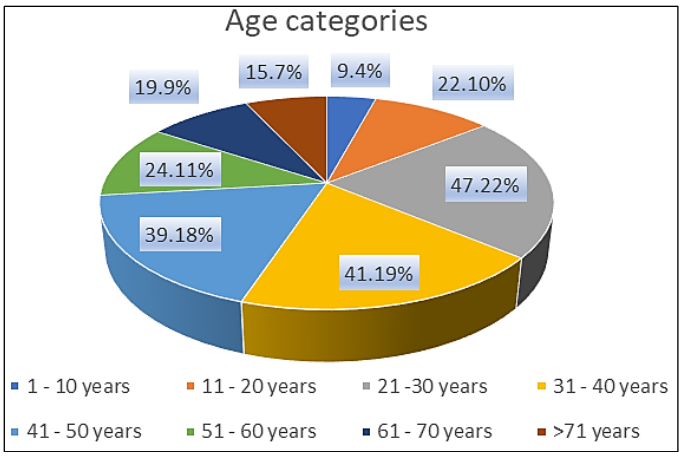

Figure 1: Age distribution among the participants

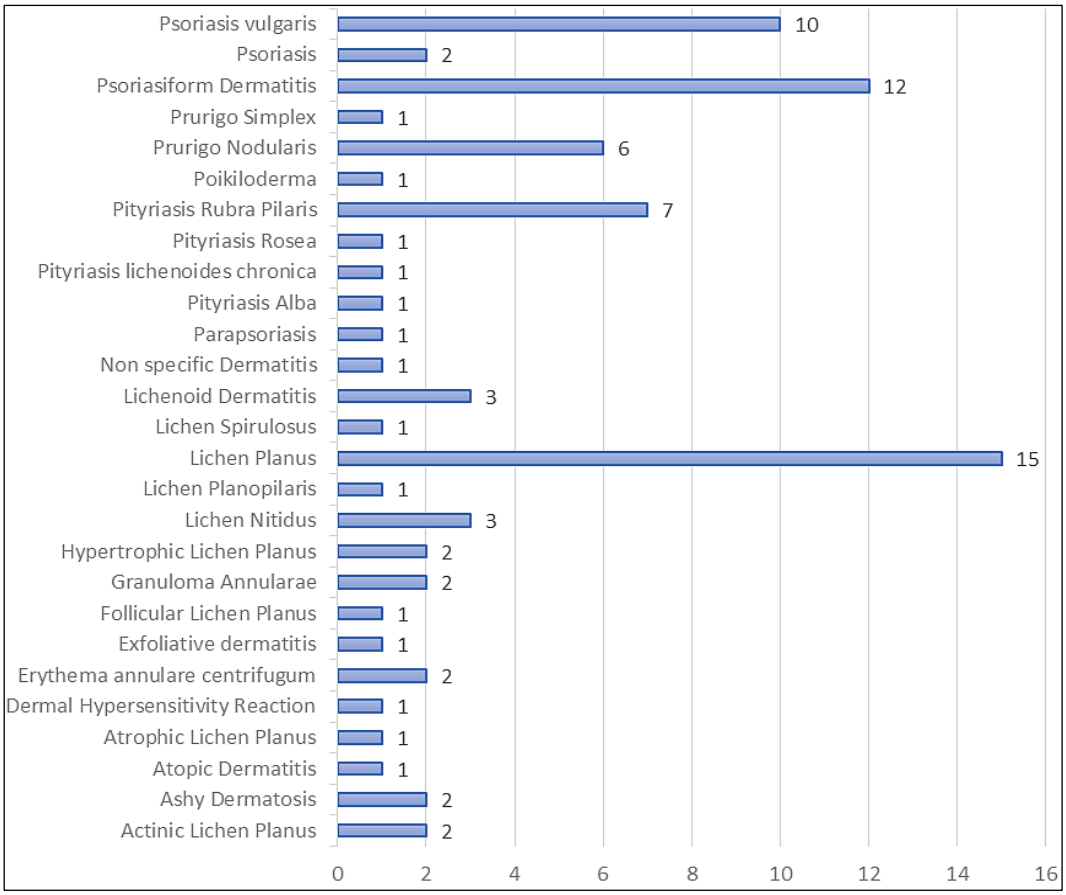

Figure 2: Histopathological distribution of Non-infectious erythematous papular and squamous diseases

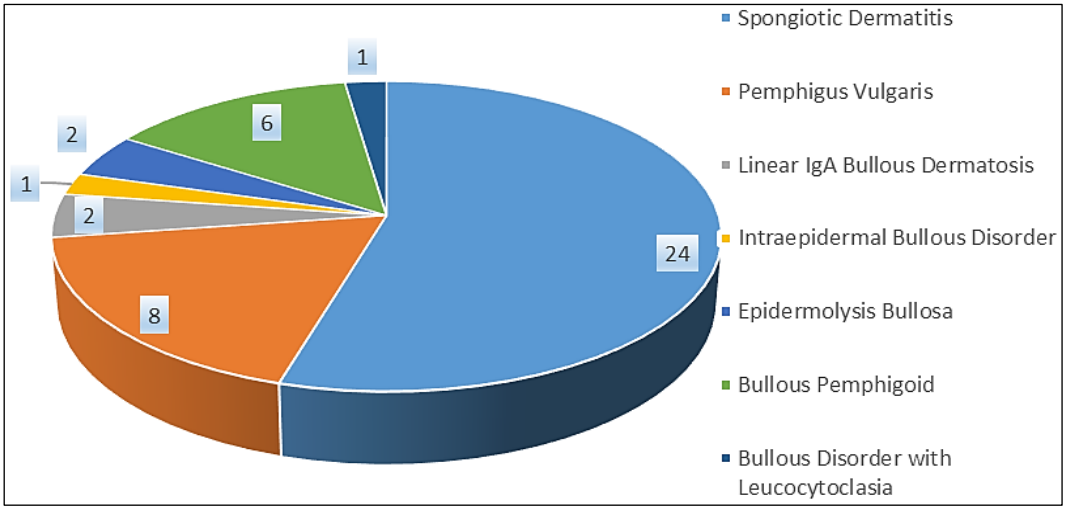

Figure 3: Histopathological distribution of Non-infectious vesiculobullous and vesiculopustular diseases

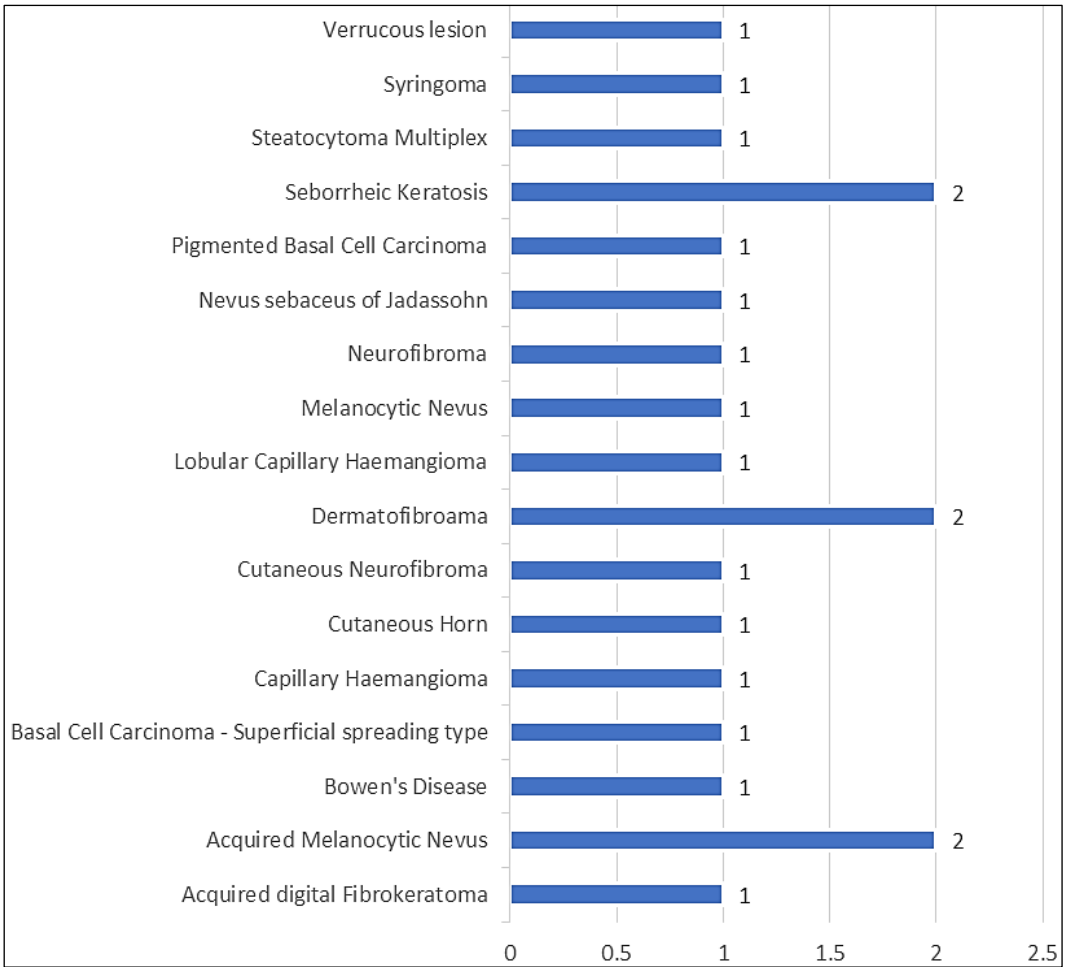

Figure 4: Histopathological distribution of neoplastic diseases of skin

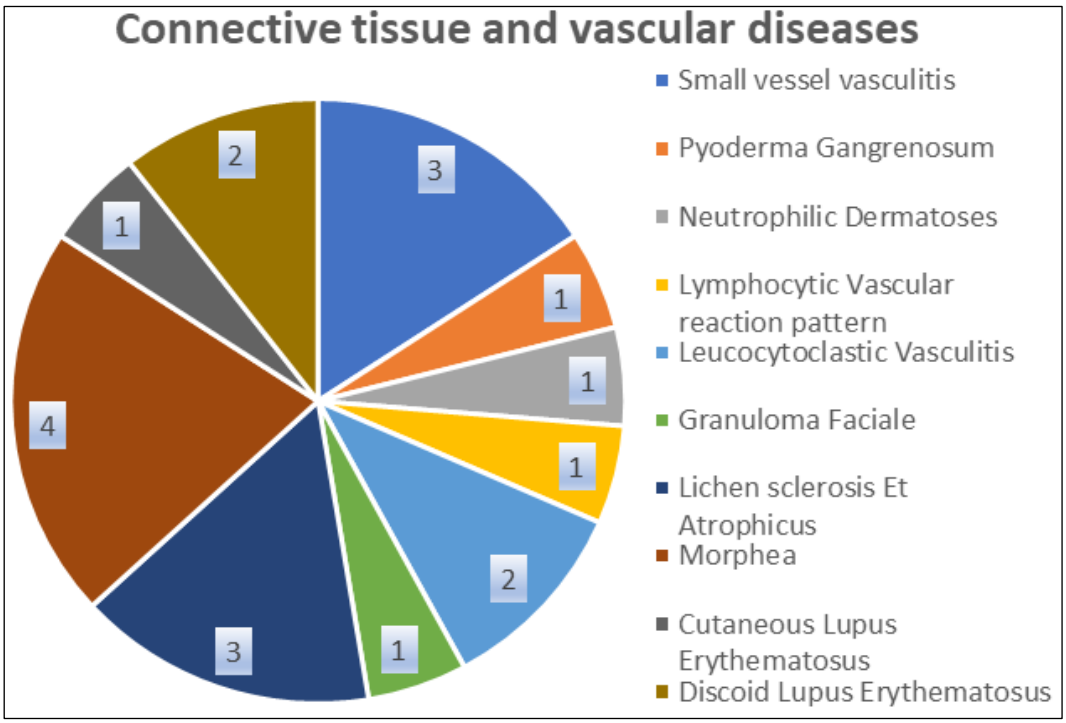

Figure 5: Histopathological distribution of Connective tissue and vascular diseases

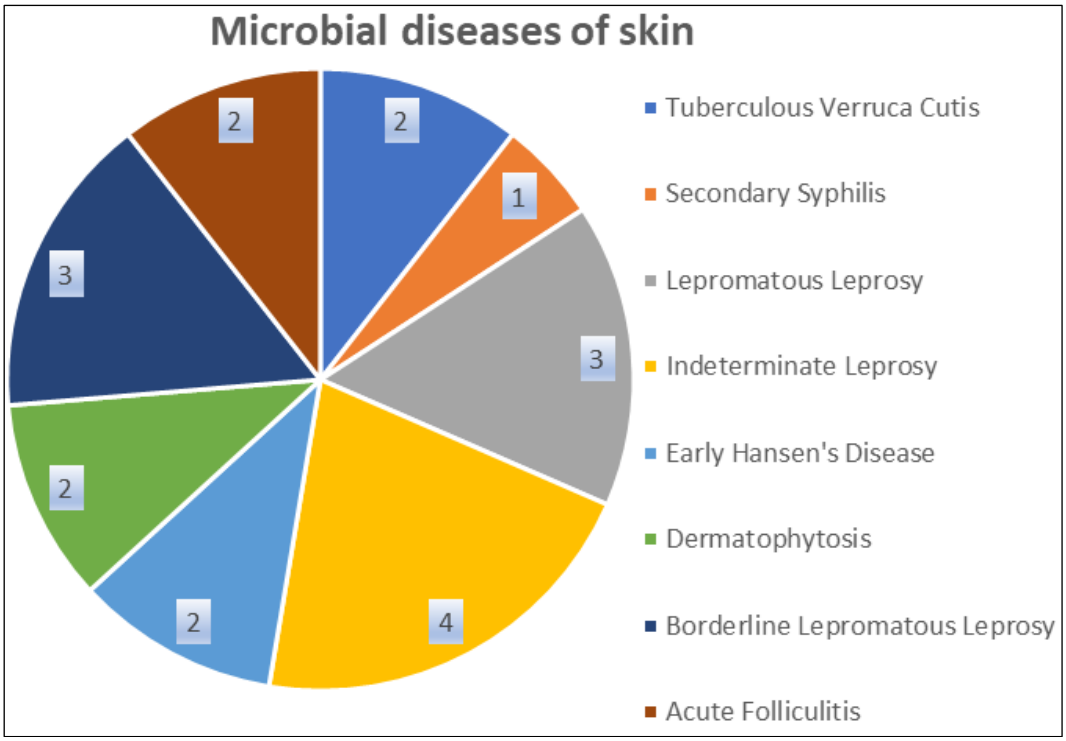

Figure 6: Histopathological distribution of Microbial diseases of skin

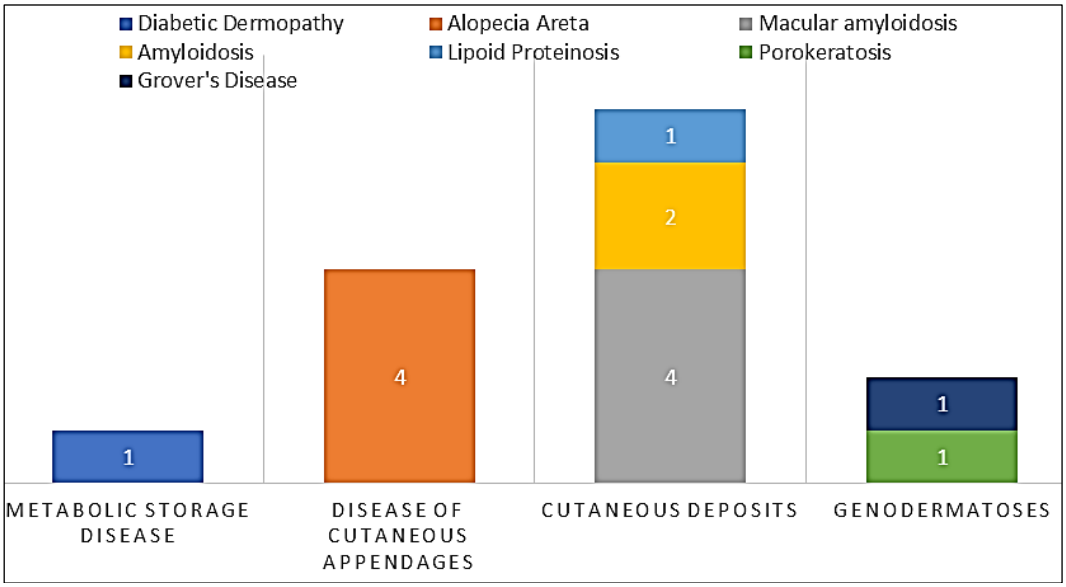

Figure 7: Histopathological distribution of metabolic, cutaneous and inherited disease of skin

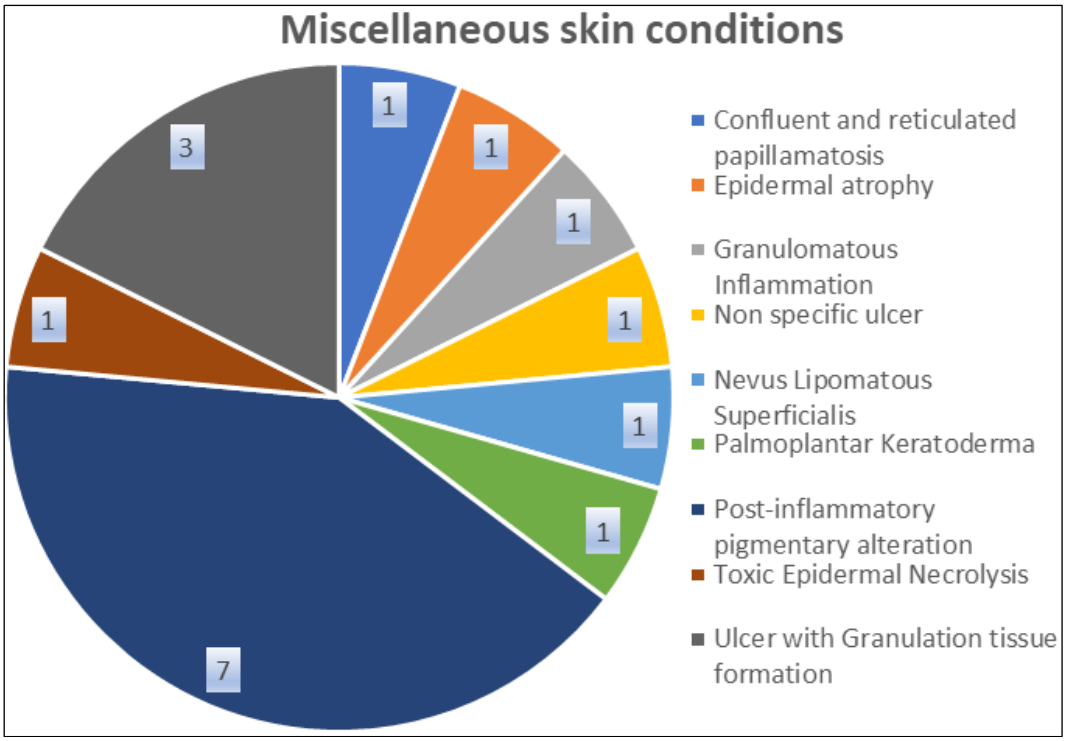

Figure 8: Histopathological distribution of Miscellaneous Conditions

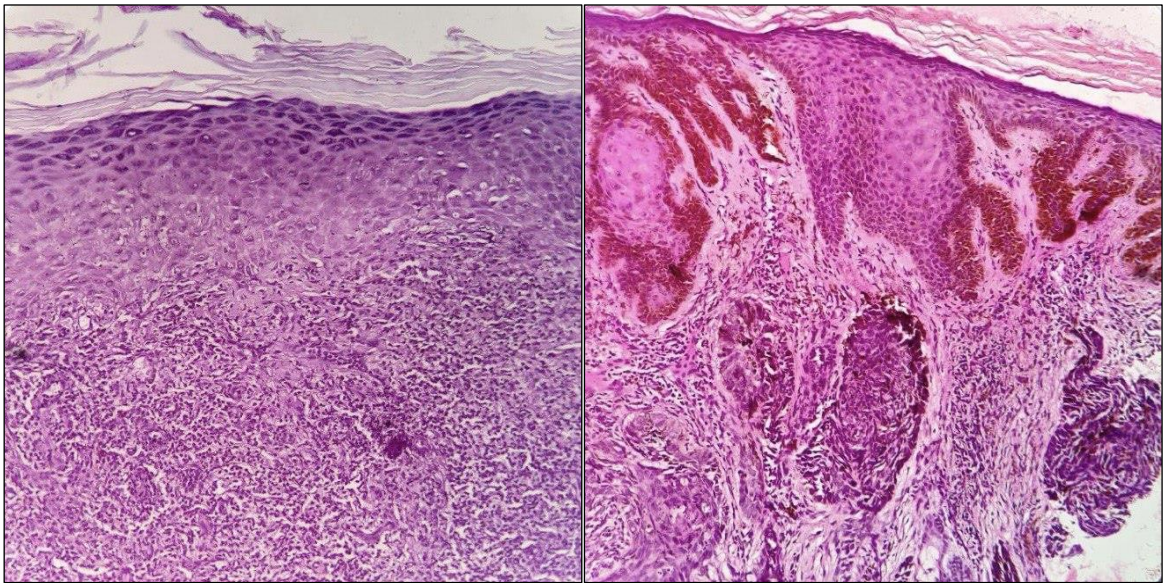

Image 1: Lichen Planus (H&E, x100)

Image 2: Pigmented Basal Cell Carcinoma (H&E, x100)

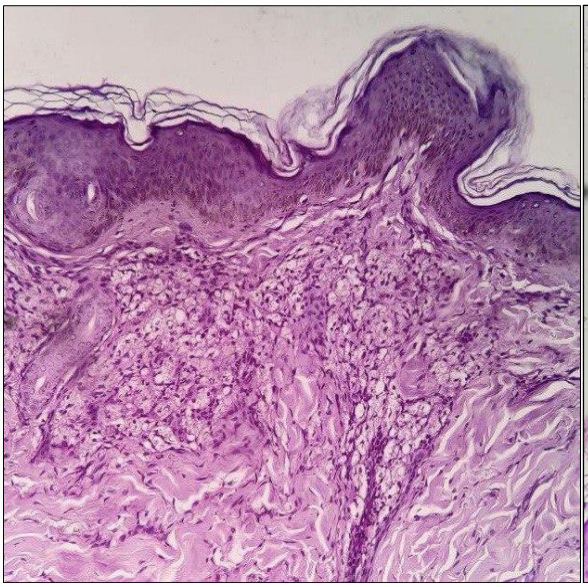

Image 3: Lepromatous Leprosy (H&E, x100)

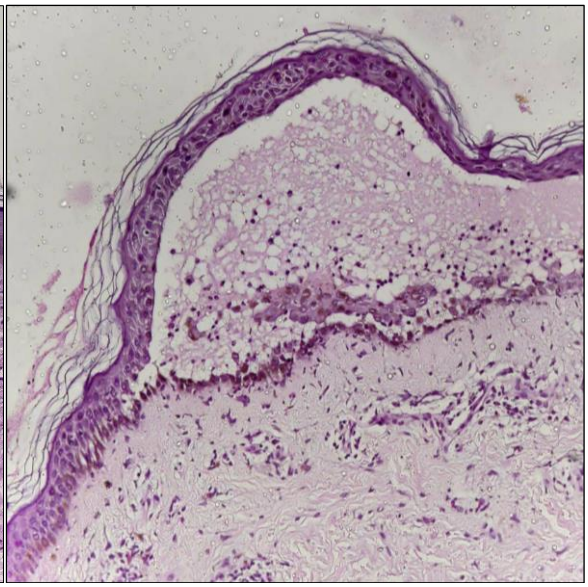

Image 4: Pemphigus vulgaris (H&E, x 100)

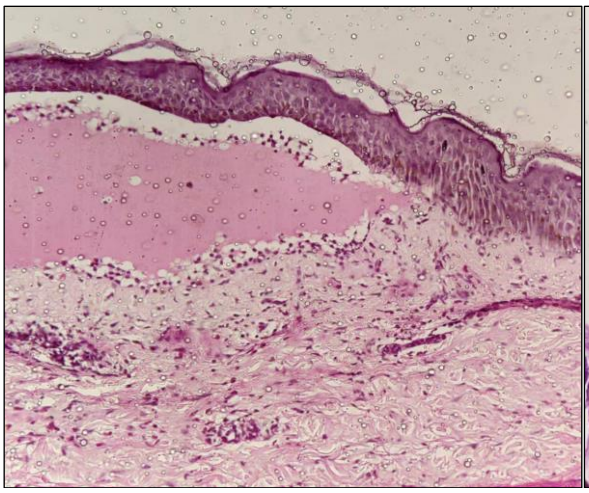

Image 5: Bullous pemphigoid (H&E, x 100)

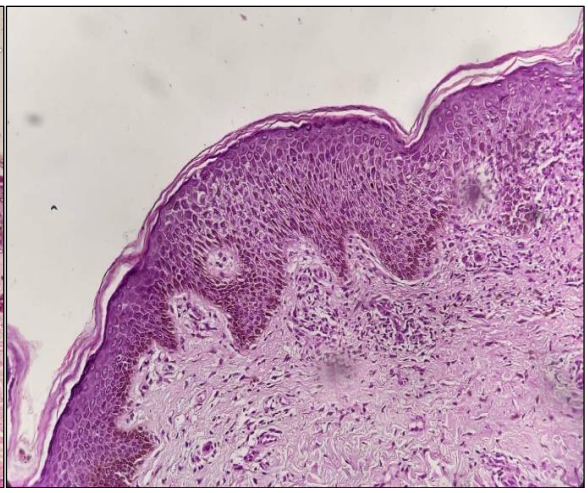

Image 6: Spongiotic Dermatitis (H&E, x100)

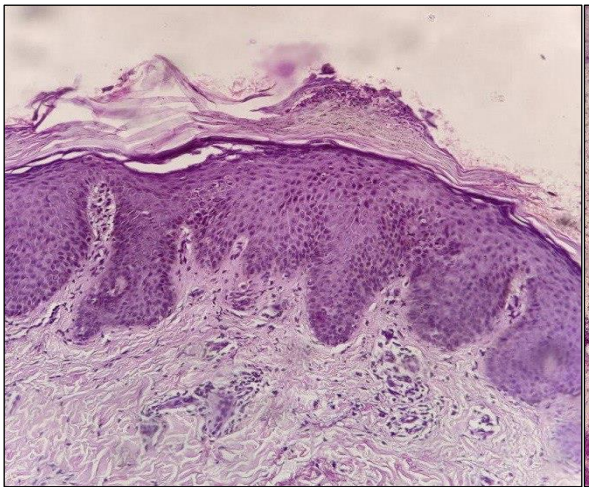

Image 7: Psoriasis Vulgaris (H&E, x100)

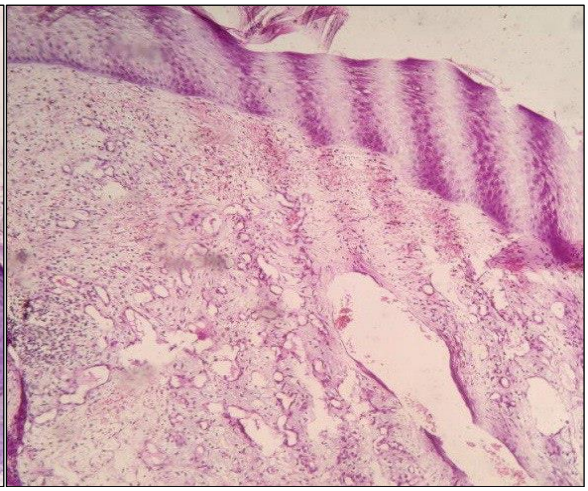

Image 8: Lobular Capillary Haemangioma (H&E, x100)

DISCUSSION

A study showed that 4.02% of the total years lived in disability was due to skin and subcutaneous disease. Among this dermatitis contributed to maximum years lives with disability followed by urticaria. The infectious and non-infectious disease burden has increased over the past three decades, however the age-standardized years lived with disability for leprosy, scabies, fungal infections, sexually transmitted infections and non-melanoma skin cancer has decreased. These high burden demand due importance in national programs and health policy of India[6].

In the Rook's Textbook of Dermatology Burns DA and Cox NH had said that there are at least 2000 different skin lesion that might present to dermatologist in all ages from neonates to very old age. These range from cosmetic issues, such as dry skin or wrinkles, to a variety of acute or chronic disease, which might be disfiguring, itchy or painful, but are rarely fatal, which if untreated may prove fatal within days.In recent years there is been an increase in awareness of the impact of skin disease on social, work and sexual relationship, thus measures to be employed to measure impairment in quality of life[7].In a retrospective study done by Talwar, Akanksha, Ballambat,*et al*., 70.48% of concordance rate was observed. It was seen that when only one differential was mentioned 66.87% concordance was observed compared to 73.96% when more than one diagnosis was mentioned. These findings reinforce the importance of skin biopsy being an indispensable tool in dermatological practice[8].

In our study there was a slight preponderance in the occurrence of skin disease in male, 118(54.6%) compared to female 98(45.4%). Majority, 127(58.9%) of the study participants belonged to 20-50 years of age. Only 9(4.2%) and 15(6.9%) were aged 5-10 years and >71 years respectively. These findings were similar to the study done by Al-Saif *et al*., who showed most (57.9%) biopsies were obtained from adults between 19 and 49 years, followed by olderadults(25.9%)andchildren(16.2%).But in their study most (58.1%) of the biopsies were from female subjects[5]. Also, in another study done by Jain S *et al*.,there was a mild preponderance seen among females[9].These variations may be due to ignorant nature and low health seeking behaviour of female in our study area. In our study, the most common site of the skin lesion was found to be the limbs(63.9%), with 46.37% in upper extremities and 53.62 in lower extremities. This was followed by 23.1% of lesion in the trunk region with distribution of 20% and 80% in the anterior andposterior region respectively; where as Al-Saif *et al*.,showed the most frequent sites of skin biopsies were the lowerextremity (29.1%), followed by the head/neck/scalp/hair (26.7%), trunk (22.1%),upper extremity (21.2%), and other sites (4.7%) [5].

Jain S, *et al*., showed the non-infectious vesiculobullous and vesiculopustular diseases were found in 42 (46.6%) cases followed by microbial diseases in 22 (24.5%) and non-infectious erythematous papular and squamous diseases in 21 (23.4%) cases[9], while there was a slight difference seen in our study showing Non-infectious erythematous papular and squamous diseases 82(38%) and Non-infectious vesiculobullous and vesiculopustular diseases 44(20.4%). This was followed by 20(9.3%) of Neoplastic diseases of skin and 18(8.3%) Microbial diseases of skin. But in a study done by Neetu Goyal *et al*., the distribution of neoplastic and non-neoplastic lesion was 66% and 34% respectively[10]. The spongioticdermatitis(26.2%),followedbybenignneoplasms(20.6%);pigmentarydiseases(9.1%),connectivetissuediseases(6.2%), infectiousdiseases(5.9%),malignantneoplasms(4.6%)andotherskindiseases(20.0%) in a study done by Al-Saif *et al*.[5]. Of the infectious dermatoses majority (66%) were bacterial[10] which was similar to that of our study.The most common diagnosis were lichen planus,spongioticdermatitis,psoriasiform dermatitis and psoriasis ulgaris. 12(5.55%) of leprosy cases were diagnosed which was 64% of bacterial cases which was similar to 75.7% seen in the study done by Neetu Goyal and Leprosy being the commonest microbial disease seen in 7 (7.8%) cases in the study done by Jain S *et al*. [9,10].

A huge diversity in skin lesions was noticed in our study ranging from eczema to fatal malignant conditions. The study confirmed a higher prevalence of non-infective dermatoses.

CONCLUSION

The morphological variations needs to be ascertained to arrive at a good diagnosis for improving the quality of life of patients with skin ailments. Different patterns of morphological changes will throw light on the severity of diseases.

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