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Original Article

Pathology Section

A Clinico-pathological Study of Papulonodular Lesions of Skin in a Rural Hospital Setup

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ABSTRACT

Introduction: Skin disorders are a common cause of morbidity in our country, High prevelance of dermatological lesions is seen in tropical countries. The spectrum of lesions varies significantly depending on the geographical region, so accurate diagnosis is of utmost importance as treatment is varied for different skin disorders presenting with similar clinical findings.

Aim: To study the spectrum of papulonodular lesions of skin and to evaluate concordance between the clinical and histopathological diagnosis of papulonodular skin lesions.

Materials and Methods: This prospective cross-sectional study was conducted in Department of Pathology at MVJ Medical College and Research Hospital, Hoskote, Karnataka, India, from October 2017 to September 2019. The study included 100 skin biopsies that had clinically presented as papules, nodules and as papulonodular lesions. Based on the histopathological findings the lesions were grouped according to aetiology and the final histopathological diagnosis was compared with the clinical diagnosis offered. The slides were stained with Haematoxylin and Eosin, examined under a microscope and findings were noted. Special stains on the tissue sections like Zeihl-Neelson and Fite Faraco were used when required. The qualitative characteristics presented using frequency and percentages, quantitative variables presented using Mean±SD.

Results: In the 100 biopsies studied 77 cases were papular, 20 cases were nodular and 3 cases were both papular and nodular. The lesions were common in males (54%) with 67% being in the 21-50 years age group. Lesions were categorised into five aetiological groups based on histology i.e. non infectious papulosquamous (25%), eczematous (23%), Inflammatory (20%), Infectious (11%) and lastly neoplastic (21%). A clinico-pathological association of 79% was observed with differences mainly observed in the eczematous group and tumours.

Conclusion: This study highlights the various common skin disorders that can present as papulonodular lesions and the significance of histopathological examination and clinico-pathological association for early diagnosis and management of skin lesions.

Keywords: Eczematous group, Inflammatory, Infectious, Neoplastic, Non infectious

INTRODUCTION

Skin disorders constitute one of the major health burdens in our society and an accurate diagnosis of these conditions is essential for proper management. The spectrum of skin diseases, including rare genetic disorders, infectious diseases, neoplasm's, and a wide variety of inflammatory disorders are huge, and in many conditions, the histological features are pathognomic of a particular skin lesion, and thus a histopathological examination of skin lesions is a must for accurate diagnosis [1].

Clinical diagnosis of different entities is often difficult as most of the skin lesions present as asymptomatic papules and nodules [2]. With the growing awareness and improvement in diagnostic facilities, precise diagnoses for various skin conditions with similar clinical presentations can be made. Accurate diagnosis of skin disorders is of utmost importance as treatment is varied for different skin disorders presenting with similar clinical features [3]. Spectrum of papulonodular lesions includes infective lesions like leprosy to neoplastic lesions like squamous cell carcinoma. The management varies drastically from only the medical line of management to surgical wide excision. Incisional biopsy is a simple and inexpensive procedure, most often the first step in the diagnosis of these lesions, therefore emphasizing the role of initial histopathological examination and categorization of these lesions. Histopathology is highly specific and sensitive to many lesions and it remains the gold standard for most dermatological diseases [4]. Fewer research studies have been carried out in this part of rural region which emphasis on the spectrum and clinicopathological correlation of papuonodular lesions. So the present study was done with the aim of studying the spectrum of papulonodular lesions of skin and to evaluate concordance between the clinical and histopathological diagnosis of papulonodular skin lesions to provide definitive diagnosis and timely management of patients.

MATERIALS AND METHODS

This prospective cross-sectional study was conducted in Department of Pathology at MVJ Medical College and Research Hospital, Hoskote, Karnataka, India, from October 2017 to September 2019. The approval was obtained from the Institutional Ethical Committee (Ref no.1006 MVJMC&RH/ADM/ECM/2017-2018). The study was conducted on 100 skin biopsies that clinically presented as papulonodular lesions to the Department of Dermatology at MVJ Medical College and Research Hospital, Hoskote.

Statiscal Analysis: Sample size was calculated using the formula.

$$n=4pq/e^2$$

where p= prevelance of skin lesions

q =1-p

e= Allowable error that is 20% of p

Present study was descriptive and prevalence was not available, so we considered expected proportion of 50% is considered to sample size and at statistical power of 80% and level of significance of 5% [5]. Sample size was 100.

Inclusion and Exclusion criteria: Skin Biopsies received from lesions that had presented clinically as papules, nodules or as papulonodualr lesions were included in the study. Previously diagnosed cases and inadequate biopsies including specimens received in a poorly preserved or autolysed state were excluded from the study.

Procedure

A punch or incisional biopsy was performed by the Dermatologist and sent to the Department of Pathology in 10% formalin. These biopsies were sent along with the histopathology request forms which had a relevant clinical history that included age, sex, presentation of skin lesions, and provisional diagnosis.

After routine processing and sectioning, slides were stained with Haematoxylin and Eosin (H&E), examined under a microscope, and findings were noted. Special stains on the tissue sections like Zeihl-Neelson and Fite-Faraco stain were analysed as and when required.

STATISTICAL ANALYSIS

Data collected entered into spread sheets, tables/charts generated using Microsoft Excel/Word. The qualitative characterstics presented using frequency/percentages, quantitative variables presented using Mean±SD.

RESULTS

In the 100 cases studied the majority of the lesions presented as papules 77 cases, followed by nodules 20 cases and as both papules and nodules in 3 cases [Table/Fig-1].

Aetiologic group		Histopathological diagnosis		Clinical presentation			Total
				Papules	Nodules	Both papules and nodules	
Non Infectious Papulosquamous		Lichen Planus		14	-	-	25
		Psoriasis		7	-	-	
		Pityriasis Rosea		4	-	-	
Eczema		Spongiotic dermatitis		14	-	-	23
		Chronic Dermatitis-Non specific		9	-	-	
Inflammatory		Leukocytoclastic vasculitis		7	-	-	20
		Polymorphous light eruption		4	1	-	
		Insect bite reaction		2	-	-	
		Discoid Lupus erythematosus		2	-	-	
		Erythema Multiforme		2	-	-	
		Prurigo simplex		2	-	-	
Infectious/ Granulomatous		Leprosy	Midborderline	1	-	-	11
			LL	-	2		
			Histoid	-	-	1	
			ENL	1	4	1	
		Lupus Vulgaris		1	-	-	
Neoplastic	Benign	Dermatofibroma		2	2	-	12
		Hemangioma		1	2	-	
		Intradermal Nevus		1	1	-	
		Cutaneous Leiomyoma		2	-	-	
		Nodular Hidradenoma		-	1	-	
	Malignant	Basal Cell Carcinoma		-	5	-	9
		Squamous cell Carcinoma		-	-	1	
		Malignant Melanoma		-	1	-	
		Metastatic		1	1	-	
Total							100

[Table/Fig-1]: Distribution of cases based on aetiology.

A wide age range was seen in the patients presenting with papulonodular lesions. The youngest case was one year old and the oldest case was 80 years with a mean of 40.5 years. Most of the patients 67 cases, (67%) were found between 21 to 50 years of age. Sex distribution of the 100 cases showed a slight male preponderance with 54 of the 100 cases being seen in males with a male to female ratio of 1.17:1. The 100 papulonodular lesions encountered in the study were categorised into five aetiological groups based on the histological findings.

The majority of cases belonged to the non infectious, eczema, and inflammatory groups accounting for 68 cases, of the 100 cases, of this 68%, non infectious papulosquamous accounted for 25 cases, Eczema 23 cases, and Inflammatory for 20 cases, of the cases. In the non infectious papulosquamous group, lichen planus was most common 14 cases, while the least common was four cases of pityriasis rosea. Total 21 cases, were encountered of which 12 cases, were benign and nine cases of malignant.

The least common category was found to be infectious 11 cases, (11%), comprising 10 cases of leprosy and a single case of lupus vulgaris. The histopathological diagnosis made in the papulonodular lesions was correlated with the clinical diagnosis offered at the time of biopsy [Table/Fig-2]. In the 100 papulonodular lesions studied, 79 cases, showed a positive clinicopathological correlation where similar diagnosis had been made by the clinician at the time of biopsy.

Aetiologic group		Disorder	Total no. of cases	Positive clinicopathological correlation	
				No. cases (%)	Total
Non infectious papulosquamous		Lichen planus	14	14 (100%)	25 (100%)
		Psoriasis	7	7 (100%)	
		Pityriasis rosea	4	4 (100%)	
Eczema		Spongiotic dermatitis	23	14 (60.8%)	14 (60.8%)
		Chronic dermatitis -nonspecific	9	0	
Inflammatory		Leukocytoclastic vasculitis	7	6 (85.7%)	18 (90%)
		Polymorphous light eruption	5	4 (80%)	
		Insect bite reaction	2	2 (100%)	
		Discoid lupus erythematosus	2	2 (100%)	
		Erythema multiforme	2	2 (100%)	
		Prurigo simplex	2	2 (100%)	
Infectious/ Granulomatous		Leprosy	10	10 (100%)	11 (100%)
		Lupus vulgaris	1	1 (100%)	
Neoplastic	Benign	Dermatofibroma	4	3 (75%)	7 (58.3%)
		Hemangioma	3	2 (66.6%)	
		Intradermal nevus	2	0	
		Cutaneous leiomyoma	2	2 (100%)	
		Nodular hidradenoma	1	0	
	Malignant	Basal cell carcinoma	5	2 (40%)	4 (44.4%)
		Squamous cell carcinoma	1	1 (100%)	
		Malignant melanoma	1	1 (100%)	
		Metastatic	2	0	

[Table/Fig-2]: Clinicopathological correlation.

In the individual subgroups, 100% clinicopathological corelation was found in the non infectious papulosquamous and infectious category of lesions followed by 18 cases (90%) in inflammatory lesions, 14 cases (60%) in spongiotic dermatitis, 7 cases (58.3%) in benign neoplasm category and four cases (44.4%) in malignant neoplasm's. Thus, the least correlation was seen in the neoplastic conditions were only in 11 of the 21 cases histopathology diagnosis matched with the clinical diagnosis. The histopathological diagnosis of all the 100 cases studied was based on both the clinical and histological features that were characteristic of each lesion.

DISCUSSION

Dermatological disorders are common and show a high prevelance in all tropical countries, but the pattern of lesions varies greatly depending on the geographic location. Skin diseases are influenced by various factors like environment, economy, literacy, and racial and social customs. The majority of skin lesions are diagnosed based on clinical presentation and history. The histopathological diagnosis in turn is used by clinicians to aid in the management of patients and for the most appropriate clinical interventions [6].

Papulonodular lesions of the skin are the most commonly encountered lesions and usually manifests in a variety as infectious diseases, benign and malignant lesions, and also as metastatic tumours. So a brief history of the clinical findings, regarding age, sex, and various sites of lesions are important for aiding accurate diagnosis [7].

In the present study, the non neoplastic lesions 79 cases (79%) outnumbered the neoplastic lesions 21 cases (21%) this relates with the findings of skin biopsy done by other authors like Gupta P et al., where only 22.1% of their 282 cases and Chalise S and Dhakhwa R recorded 27.8% of 133 cases were neoplastic [8,9]. But unlike this common trend, Patel S et al., studied the cytological findings in papulonodular lesions and found an equal number of neoplastic and non neoplastic lesions [10]. This could be due to the differences in the populations being studied and the timing as to when patients come for clinical evaluation.

Gupta I et al., studied the various clinical presentations of non neoplastic papulonodular skin lesions and found papules accounting for 94.1% and nodules in 5.9% of her 34 cases. This is similar to present study, where out of the 79 cases of non neoplastic lesions, 88.6% had presented as papules and 8.8% had presented as nodules. In the present study we encountered two cases of non neoplastic lesions which presented as both papules and nodules which were not documented by Gupta I et al., [11].

The age distribution of papulonodular lesions encountered was compared with other studies. Patel S et al., who studied papulonodular lesions found 70% of 50 cases, Deepti KN et al., reported 54.4% of 125 cases and Gupta P et al., reported 79% of 282 cases studied to be within 21-50 years of age, similar to the present study where 67% of the 100 cases were in 21-50 years age group [8,10,12].

Among the cases that were 20 years of age and less, 17 cases (17%) were recorded. A similar finding were observed by Patel S et al., and Deepti KN et al., with an incidence of 22% and 15.2% respectively as depicted in the [10,12] [Table/Fig-3].

On analyzing 100 cases on gender bases presenting as papulonodular lesions present study listed more number of cases in males as to females with a male to female ratio of 1.17:1. Similar finding were observed by other authors, on contrary Jha HK and Pokharel A, observed female predomince in their study with a M:F ratio of 1:1.5 [10,12,13].

In the non infectious papulosquamous group, lichen planus was most common lesion with 14 cases, 14% followed by psoriasis with seven cases, 7% similar observation was done by George VP et al., (36.4%) of lichen planus cases followed by 28.8% of psoriasis [14]. A study by Chalise S et al., accounted higher percentage (54.5%) of psoriasis cases followed by 44% of lichen planus [9]. In eczemamatous conditions we reported 23 cases, 23% of cases. However, study by Gupta P et al., observed lower percentage 10.9% of cases eczematous disorders [8]. Among the infectious disorders highest number of cases were of 10 cases (10%) leprosy cases, similar observations were done by Adhikari et al., [15] with 23% of leprosy cases [10]. In the present study it was recorded that, 21 cases (21%) of neoplastic lesions almost similar incidence 19% of neoplastic lesions were reported by Adhikai RC et al., [15]. However the study of Bezbaruah R and Baruah M, and Abubaker SD et al., neoplastic lesions were the major entites of the total cases studied [16,17].

On comparing the overall correlation between the clinical and histopathological diagnosis of all the papulonodular lesions we recorded 79% of cases histopathological diagnosis was consistent with the clinical diagnosis. Other studies done by Patil R et al., and Gupta P et al., recorded a overall concordance of (89.33%) of 75 cases and 85% of 282 cases, variation noted between the studies may be due to the difference in nature of lesions encountered in the study period [7,8] as shown in [Table/Fig-3].

Limitation(s)

In some cases especially tumours the clinician had limitations in specifying a specific diagnosis and similarly in cases of eczema we could not offer any further help in the patient management because of very mild and non specific findings in about 40% of cases. However, even in these cases where a diagnosis of non specific diagnosis was offered, the biopsy aided in ruling out an infective or malignant aetiology.

Author and year of publication	Sample size	Place of study	M:F ratio	Most common age range (21-50 years)	Most common lesion	Non neoplastic lesions (%)	Benign lesions (%)	Malignant lesions (%)	Over all concordance (%)
Patil R et al., (2015) [7]	75	Gujurat	1.9:1	-	69% Infectious Papulosquamous leiosns	69%	24%	7%	89.3%
Patel S et al., (2016) [10]	50	Mysore, Karnataka	1.4:1	70.9%	13% Epidermal cyst	57.14%	17.5%	4.6%	-
Sushama C et al., (2018) [6]	234	Tirupati, Andhra Pradesh	1.7:1	Majority <50 years	36.32% Cutaneous cysts	58.11%	17.09%	24.78%	-
Gupta P et al., (2018) [8]	282	Meerut	1.5:1	79%	34.6% Infectious lesions	66.6%	14.8%	3.9%	85.8%
Deepthi KN et al., (2020) [12]	125	Telagana	1.7:1	54.4%	41.6% Cutaneous cysts	61.5%	22.4%	16%	-
Jha HK and Pokharel A (2021) [13]	85	Nepal	1:1.5	56.4%	29.4% Infectious lesions	>90.5%	7.05%	-	60%
Present study (2022)	100	Hoskote, Karnataka	1.17:1	67%	25% Non infectious papulosquamous leiosns	68%	7%	4%	79%

[Table/Fig-3]: Comparison of age, sex, distribution of lesions, and over all concordance of lesions with various other studies.

CONCLUSION(S)

A large spectrum of diseases can present as papulonodular lesions ranging from non infectious papulosquamous to inflammatory and neoplastic lesions. Hence, a wide spectrum of disorders were encountered in the present study. Non neoplastic lesions outnumbered the neoplastic lesions. As a group, they occurred more commonly in a younger population with a near equal male-female distribution, which is an expected finding considering the cosmetic skin consciousness in all young individuals irrespective of their gender. In the present study, over all concordance was 79%, the histological diagnosis was made considering all features including the clinical characteristics of the lesions and histological features. Hence, emphasing the role of biopsy and clinicopathological corelation for early diagnosis and management of skin lesions.

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