



## Original Research Article

## Clinico-histopathological correlation of follicular skin lesions

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## ARTICLE INFO

## Article history:

Received 01-08-2019

Accepted 12-09-2019

Available online 14-09-2019

## Keywords:

Follicular

Keratosis pilaris

Phrynoderma

## ABSTRACT

**Introduction:** Follicular skin lesions are common skin problems which are caused by inflammation and infection of the hair follicles. The objective of the study was to know the incidence of the follicular skin lesions among patients attending Dermatology department and correlate them clinically and histopathologically.

**Materials and Methods:** This study was conducted January 2019 to June 2019. One hundred patients with follicular skin lesions were included in the study. Detailed history, clinical examination and skin biopsy for histopathology was done. In all cases clinical diagnosis was confirmed by histopathology.

**Results:** Phrynoderma was found to be most common (42 cases) followed by Keratosis pilaris (24 cases), pityriasis rubra pilaris (8 cases), Kyrle's (6 cases), Darier's disease (5 cases), follicular lichen planus (4 cases), perforating folliculitis (4 cases), lichen spinulosus (2 cases), follicular psoriasis (1 case), lichen scrofulosorum (1 case). Three cases were found to be non-specific on histopathology. Phrynoderma was most common (42%) follicular skin lesion among children. Keratosis Pilaris was common in adult females whereas Darier's disease and Kyrle's disease in adult males. Atopy was most commonly associated with keratosis pilaris.

**Conclusions:** The present study emphasizes the various follicular skin lesions in this geographical location. Both clinical examination and histopathology helps in differentiating different follicular skin lesions.

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## 1. Introduction

The skin is a complex organ and because of its complexity, a wide range of diseases can develop from it. These include diseases arising from dermis, epidermis and epidermal appendages like hair follicles and nails.<sup>1,2</sup> The entire cutaneous surface is populated by hair follicles with the exception of the palms, soles, dorsa of terminal phalanges of digits, glans penis, and mucocutaneous junctions.

Diseases affecting the hair follicle can arise denovo from the hair follicle or secondary to cutaneous disorders and are termed follicular skin lesions.<sup>3</sup> Follicular skin lesions are a heterogeneous group of disorders which are a common cause of frequent hospital visits among children and adults. These ranges from preventable skin disorders like phrynoderma to life-threatening conditions like pityriasis rubra pilaris leading to erythroderma.<sup>4</sup> They

have a major impact on the quality of life both from the medical and cosmetic point of view. The distinctions between different follicular skin lesions are rather difficult and histopathological study is used to establish diagnosis which is the most valuable means of diagnosis in dermatopathology in spite of its own limitations.<sup>5</sup> Histopathology is diagnostic in some cases differentiating various skin conditions, though not all.<sup>6</sup> But even in those cases, it helps to rule out other diseases based essentially on characteristic clinical features. Moreover, skin biopsy is an easy technique.<sup>7,8</sup> It can be performed safely, painlessly with minimal or no scarring. Keeping in view these facts, an attempt is made to study different follicular skin lesions in relation to its histopathology which will bear an impact on patient management. Therefore the study was undertaken to study the incidence of follicular skin lesions among patients attending Dermatology Outpatient Department (OPD) at Mahavir institute of medical sciences

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to assess the association of follicular skin lesions with other dermatological and systemic disorders, and correlate them with the clinical features and histopathology.

## 2. Materials and Methods

This study was conducted between January 2019 to June 2019 in Dermatology OPD of Mahavir institute of medical sciences, Vikarabad. A total of 100 patients presenting with follicular skin lesions were included in the study. Informed consent was taken from all the patients. Detailed history including age, sex, occupation, duration of skin lesion, associated itching or burning sensation, aggravating and relieving factors were taken from all patients. Skin biopsy was done and sent to histopathology of hematoxylin and eosin stain (H&E). Blood investigations like complete blood count, urine examination, liver function tests, renal functions test, and lipid profile were done wherever necessary.

Statistical analyses were conducted with Statistical Package for the Social Sciences (SPSS Inc, Chicago, IL) version 11.0. Fisher's exact test was used to assess associations between various variables.  $P < 0.05$  was considered to be statistically significant.

## 3. Results

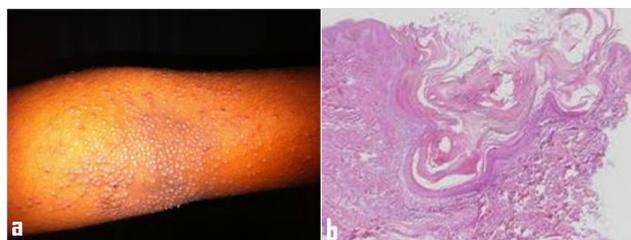
Out of 100 cases 46 were males and 54 were females. Most of the patients (85%) were in the age group of 0-30 years. All patients were underwent skin biopsy. Clinical and histopathological diagnosis is compared in table 1.

Phrynoderma was found to be most common among in either sex and also most common among children (37%) followed by keratosis pilaris (8%). Keratosis Pilaris was most common among adult females whereas Darier's disease and Kyrle's disease was most common among adult males. Out of 6 cases of Kyrle's disease, 3 were associated with DM, 2 with CKD and 1 with upper respiratory tract infection. Most of keratosis pilaris patients were associated with atopy.

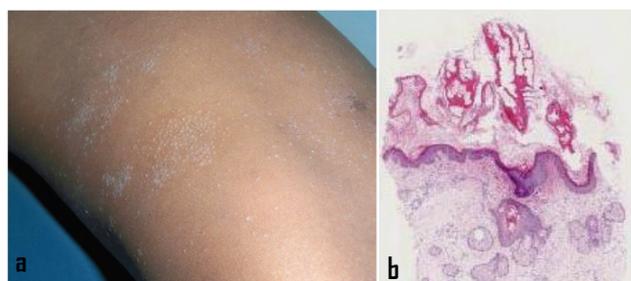
Positive family history was noted in 20 cases, of which keratosis pilaris in 12, phrynoderma in 3, pityriasis rubra pilaris in 2, Darier's in 2 and Kyrle's disease in 1. Among 2 patients of lichen spinulosus, one was associated with lichen planus and other with lichen planus and palmoplantar psoriasis. One case of follicular lichen planus developed cicatricial alopecia and subsequently Graham-Little- Piccardi Syndrome. Maximum clinico-pathological correlation was seen in phrynoderma and least in Follicular psoriasis.

## 4. Discussion

Skin diseases are a major public health problem in the society and are associated with significant morbidity.<sup>9</sup> This study was documented the clinico-histopathological



**Fig. 1:** a. Multiple grouped follicular keratotic papules over right elbow b. Histopathology of H&E stain showing follicular plugging.



**Fig. 2:** a. multiple grouped follicular spiny papules b. Histopathology of H&E stain showing keratotic plugging of the follicular infundibula with perivascular lymphocytic infiltrates

correlation of skin lesions at our rural background tertiary care center. Dermatological problems constitute at least 30% of all outpatient visits in a hospital. Follicular skin lesions are the disorders affecting the hair follicles which are clinically characterized by keratotic papules, comedones, and pustules over the hair follicular openings. The pathogenesis lies in the pilosebaceous unit affecting mainly the keratinization process, others being immunologically mediated, secondary to infections, tumors, etc.<sup>10,11</sup>

In the present study phrynoderma was found to be most common cases of follicular skin lesions. Since phrynoderma commonly occurred in children and adolescents,<sup>11</sup> our study also showed that most of the phrynoderma cases were in age group less than 10 years. The incidence of skin lesions decreasing with increase in age i.e. children outnumbered adults, this could be due to multiple factors such as environmental, social and lack of health education.<sup>12</sup>

Most of the cases of skin disease are sporadic, but familial forms of the disease have been described. Out of 100 cases, 20 cases had a positive family history of which keratosis pilaris in 12, phrynoderma in 3, pityriasis rubra pilaris in 2, Kyrle's disease in 1 and Darier's disease in 2. Pityriasis rubra pilaris in particular linked to mutations in the gene CARD, therefore it can be inherited and may be associated with a wide variety of other rare skin diseases.<sup>13</sup> Out of 24 cases of keratosis pilaris, 12(50%) had family history. This was comparable with a study by Poskitt et al.<sup>14</sup>

**Table 1:** Comparison of clinical and histopathological diagnosis in the study subjects

Clinical conditions	Clinical Diagnosis	Histopathological Diagnosis
Phrynoderma (figure 1)	47	42
Keratosis Pilaris	15	24
Pityriasis rubra pilaris	7	8
Kyrle's disease	8	6
Darier's disease	9	5
Follicular Lichen planus	3	4
Perforating folliculitis	6	4
Non-specific	0	3
Lichen spinulosus (figure 2)	3	2
Follicular psoriasis	0	1
Lichen scrofulosorum	2	1
Total	100	100

Author studied 49 patients of keratosis pilaris and noted positive family history in 19(39%) patients. Among the 42 cases of phrynoderma only 3(6.67%) patients had positive family history. Previous studies showed positive family history of 3-4% in phrynoderma.<sup>11,15</sup>

Kyrle's disease is commonly seen in patients with diabetes mellitus, hypertension and chronic renal failure.<sup>16,17</sup> In our study out of 6 cases of Kyrle's disease, 3(50%) were associated with diabetes mellitus, 2(33.3%) with chronic kidney disease and 1(16.6%) with upper respiratory tract infection but no associated systemic condition. Joseph D et al. studied 21 patients of Kyrle's disease, of which 14(66.6%) had diabetes mellitus, 12(57%) had nephropathy, 6(28.5%) had renal failure, 2(9.5%) had congestive cardiac failure and 1(4.7%) had genitourinary tuberculosis.<sup>18</sup> The pathogenesis associated with diabetes mellitus is unknown, it may be an outcome of changes in the epidermis or dermis leading to metabolic derangements and a cutaneous response to the superficial trauma and vasculopathy arising from products of oxidative damage or endoplasmic stress like advanced glycation end products and oxidized low-density lipoprotein.

Pityriasis rubra pilaris is a heterogeneous group of disorders that have circumscribed follicular keratosis, brawny skin and orange red erythema. Pityriasis rubra pilaris contributes to 1% of all cases of erythroderma.<sup>19</sup> In present study, out of 8 cases of pityriasis rubra pilaris, one case developed erythroderma. Classical clinical and histopathological features are important for the diagnosis of pityriasis rubra pilaris as serologic or immunohistochemical markers are not able to assist the diagnosis.

Atopic dermatitis is a common chronic pruritic inflammatory skin disorder. It has the complex pathogenesis, involving genetic and environmental factors that are associated with immune dysfunction, barrier defects, and altered skin microbiomes.<sup>20,21</sup> Most people with keratosis pilaris are commonly associated with atopic dermatitis.<sup>22</sup> Similar association was also seen in our study.

Lichen spinulosus is a rare dermatosis manifested by flesh- coloured follicular keratotic spiny papules. Though there are no consistent systemic associations with lichen spinulosus, multiple reports have linked it with atopy, human immune deficiency (HIV) infection, alcoholism, acne conglobata, Hodgkin's lymphoma, Crohn's disease, heavy metal like gold, thallium ingestion, and infectious conditions like syphilis, lichen scrofulosorum, and a mycoticid reaction. Among 2 cases of lichen spinulosus, one was associated with lichen planus and other with lichen planus and palmoplantar psoriasis.

Lichen planopilaris is another uncommon inflammatory hair disorder which is clinically characterized by perifollicular erythema, follicular hyperkeratosis, and scarring hair loss, mostly affecting the vertex and parietal areas of the scalp. It has been reported in about 30% of patients with cutaneous or mucosal lesions of lichen planopilaris.<sup>23</sup> Follicular lichen planopilaris was present in 4 cases, out of which 1 case developed cicatricial alopecia and subsequently Graham-Little- Piccardi Syndrome. It can alter integrin expression and interferon-gamma dysregulation. This alteration in integrin expression creates the gelatinous consistency of the follicular root resulting in a positive anagen hair pull test of active affected sites.<sup>24</sup>

## 5. Conclusions

The present study emphasizes the various follicular skin lesions in this geographical location. Histopathology is diagnostic in some cases though not in all. But even in those cases, it helps to rule out other differential diagnosis. Clinical presentation and the confirmed diagnosis by histopathology can be helpful for differential diagnosis and it is the key to providing optimal patient care.

## 6. Acknowledgments

Authors is thankful to all the patients and volunteers who participated in this study and grateful to the faculty of department of Mahavir institute of medical sciences,

Vikarabad.

## 7. Source of Funding

None.

## 8. Conflicts of Interest

None.

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**Cite this article:** Ravindra Kumar P, Malkud S. Clinico-histopathological correlation of follicular skin lesions. *Indian J Clin Exp Dermatol* 2019;5(3):216-219.