

Chronic non-scarring folliculitis among Saudi adult patients: clinicopathological features and literature review

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ABSTRACT

Background: Recurrent scalp folliculitis remains a challenging situation for dermatologists and patients due to the lack of exact guidelines and the hypotheses regarding causative factors. There are very limited data on patients with chronic non-scarring folliculitis in Saudi Arabia.

Objective: To assess the etiology and factors associated with chronic non-scarring folliculitis among Saudi adult patients.

Methods: From October 2012 to September 2015, we performed a prospective study at King Khalid University Hospital, Riyadh, Saudi Arabia. Patients with scalp folliculitis were invited to participate in the study. Diagnosis of chronic non-scarring folliculitis was done clinically and confirmed by swab from the lesion for Gram's staining, scraping for KOH mounting, and biopsy for cultures and histopathology.

Results: 22 patients with chronic non-scarring folliculitis were enrolled in the study during the three-year study period. The mean age was 29.9 ± 12.7 years old. Of these, 77.3% were males and 22.7% were females. Mean duration of the condition was 4.4 ± 5.0 years. 100% had active erythematous pustules and excoriated papules. All the patients had an oily scalp. Eight patients had a history of acne vulgaris. No post-lesional scarring was present. KOH examination was positive in one patient. Staphylococcus aureus, Pityrosporum ovale and Demodex folliculorum were identified in three patients. The important histopathological findings were acute neutrophilic folliculitis in 84.4% of the patients and perivascular lymphocytic infiltration, eosinophils, and foreign body giant cell reaction in 16.6% of the patients.

Conclusion: Chronic non-scarring folliculitis is not a rare scalp dermatosis, but the diagnosis is challenging because of overlapping features, both clinically and histopathologically. Increased incidence among male patients and association with oily scalp without seborrheic dermatitis or acne vulgaris, make chronic non-scarring folliculitis a unique entity. Whether it constitutes a separate disease entity or a variant of acne vulgaris, it requires further investigation.

KEY WORDS: Chronic, folliculitis, scarring

INTRODUCTION

Folliculitis is an inflammatory reaction in the superficial aspect of the hair follicle and can involve the follicular opening or the perifollicular hair follicles.¹ There are controversies regarding the classification of folliculitis. It has been classified according to the causative factors either infectious folliculitis or noninfectious folliculitis, the other way of classification is according to the histopathology features specially the inflammatory cell types and depth of

follicular inflammation.^{2,3,4,5} The pilosebaceous unit of the follicle is divided into three compartments: the infundibulum (superficial part, outlined by the sebaceous duct), the isthmus (between the sebaceous duct and arrector pili protuberance), and the inferior segment (stem and hair bulb).¹ Chronic non-scarring folliculitis of the scalp⁶ is a relatively common condition in dermatological practice, but is also a major diagnostic and therapeutic challenge, due to the lack of exact guidelines and the hypotheses

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regarding causative factors. Chronic non-scarring folliculitis is manifest as a tender or painless, 1 mm-wide pustule, or papulopustules in acute cases, that heals without scarring.^{1,6,7} In the literature, a number of causative factors have been highlighted. Hersle K *et al.* suggested that chronic non-scarring folliculitis of the scalp probably constitutes a disease entity.⁶ In contrast, Howard, *et al.* and others claimed that the etiology of chronic non-scarring folliculitis is *Corynebacterium acne*, and this condition is just part of pustular acne and frequently misnamed as staphylococcal folliculitis.^{8,9} Khumalo, *et al.* reported that approximately 37% of African adults in their study had at least one episode of transient pimples and some of these patients had recurrences; and they found an association between these pimples and hairstyles.¹⁰ Recently, Pitney, *et al.* reported a unique relationship between a clinically identifiable chronic scalp dermatitis-folliculitis with the characteristic histological features of low-grade inflammatory fibrosing alopecia, resulting in a distinctive progressive cicatricial alopecia.¹¹ Sometimes there is an association between oily scalp, perspiration, harsh chemicals and solvents, or an association between wearing a restrictive type of clothing and folliculitis.^{12,13,14} Because of its broad differential diagnoses and high recurrence rates, despite its sensitivity to many antibiotics,¹⁵ it is essential to recognize the cause either by clinical, histopathological, bacterial and fungal cultures, and even KOH swabs. We conducted this study to identify the underlying causes of chronic non-scarring folliculitis among Saudi adult patients, recognize the presenting histological features of chronic non-scarring folliculitis and determine any correlation/s between chronic non-scarring

folliculitis with history of acne, history of excessive oily skin, duration of illness, and the results from the gram staining, KOH mounting, and culture.

METHODS

The study was carried out in the Dermatology clinic of King Saud University Medical City in Riyadh, Saudi Arabia, from October 2012 to September 2015. Patients with active scalp folliculitis were included after obtaining informed written consent. Exclusion criteria for our patients included the following: Age less than 18 years; patients under any kind of chronic non-scarring folliculitis treatment for the last four weeks; severe past medical history (Diabetes, malignancy, autoimmune disease); pregnant patients; patients with concomitant acne vulgaris and patients with other scalp dermatoses such as folliculitis decalvans, dissecting folliculitis, lichen planus and discoid lupus erythematosus. Consenting patients underwent a thorough history and clinical examination by a consultant dermatologist. A prepared data collection sheet was completed and the lesions were photographed.

Diagnosis of chronic non-scarring folliculitis was confirmed by swab from the lesion for Gram's staining, scraping for KOH mounting, and skin biopsy for cell culture and histopathology. Histopathological diagnosis was carried out by a consultant dermatopathologist. Since the study population is small, individual patient's results were analyzed. Statistical means and standard deviations, as well as frequencies and percentages were derived using the Predictive Analysis Software (PASW) version 18 (SPSS Inc., IBM, Chicago, Illinois, USA). Results

were expressed as mean, standard deviation and percentages. Correlations were carried out using the Chi-square test. P values of <0.05 were considered statistically significant.

RESULTS

There were 22 patients of chronic non-scarring folliculitis, with 17 males (77.3%) and 5 females (22.7%). The male: female (M: F) ratio is 4:1. The mean age was 29.9 ± 12.7 years old (range: 18 – 70 years old). Mean duration of the illness was 4.4 ± 5.0 years (range: 1 – 20 years). All patients had active erythematous pustules and excoriated papules over the scalp (Fig. 1, 2). No post-lesional scarring was present. All patients

had an oily scalp. Eight patients (36.4%) had a history of acne vulgaris, three of which had a positive Gram's stain finding of Gram negative bacteria. The KOH mount was positive in one (4.5%) patient. Three patients (13.6%) had been previously treated with various regimens including topical steroids and topical or oral antibiotics.

Histopathology showed acute neutrophilic folliculitis in 84.4% of our patients and 13.6% showed perivascular lymphocytic infiltration, eosinophils and foreign body giant cell reaction. Some 13.6% had pathogens including *Staphylococcus aureus*, *Pityrosporum ovale* and *Demodex folliculorum* (Fig. 3, 4).



Fig. 1 A male patient with chronic non-scarring folliculitis.



Fig. 2 Top view of the pustular scalp lesions in a male patient with chronic non-scarring folliculitis.

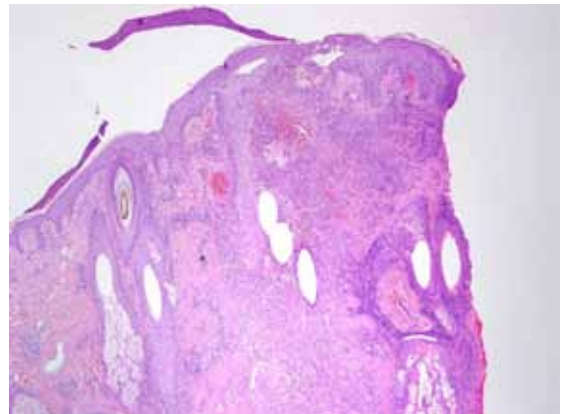


Fig. 3 Punch skin biopsy shows unremarkable epidermis and dermis with underlying distorted and dilated pilosebaceous unit (H/E stain, x40).

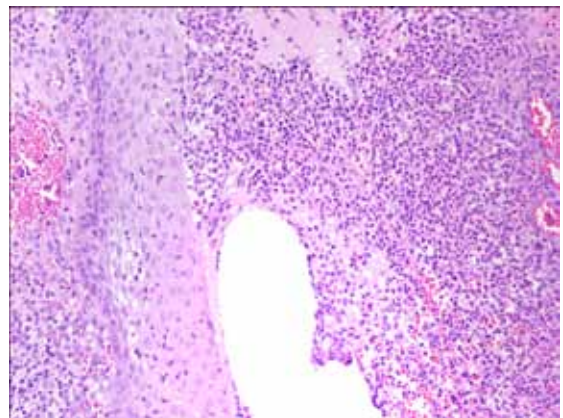


Fig. 4 High power on the hair follicle epithelium reveals neutrophilic infiltration indicating acute folliculitis. (H/E stain, x400).

Chronic non-scarring folliculitis tended to be more common among male patients ($r=6.545$, $P=0.011$) and to a positive history of oily scalp ($r=4.545$, $P=0.033$). On the contrary, a history of acne vulgaris was not significantly associated with chronic non-scarring folliculitis ($P=0.201$). Findings from the Gram stain, KOH mount and culture were all not significantly correlated to chronic non-scarring folliculitis ($p>0.05$).

DISCUSSION

The present study describes the clinicopathological presentation and investigations that may related to the causative factors of chronic non-scarring folliculitis. A total of 22 patients with chronic non-scarring folliculitis were enrolled in the study during the 3-year study period. The mean age of patients is 29.9 ± 12.7 years and the male: female (M:F) ratio is 4:1, a higher incidence among males was consistently observed among previous studies.^{6,9} This male to female ratio may reflect a different view on the degree of tendency to have the disease. Some 36.4% of our patients had history of acne vulgaris, this finding is higher than 17.5% reported by Hersle⁶ and less than 71.7% reported by Khalifa,⁹ on the other hand, Hersle's and Khalifa's patients had concomitant acne vulgaris and they did not account for the whole incidence of acne vulgaris.

Seborrheic dermatitis is characterized by itchy poorly defined erythematous, flaking, and greasy-looking patches. The scalp is almost invariably the affected site.¹⁶ Colonization of the skin by the lipophilic yeast *Malassezia* plays an aetiological role in both seborrheic dermatitis and *Malassezia* (*Pityrosporum*) folliculitis.^{17,18,19} Oily skin or occlusion of the skin and hair

follicles with skin-care products or cosmetics can predispose to *Malassezia* folliculitis.^{10,20} Our study has shown that, approximately 100% of the patients had an oily scalp without any features of seborrheic dermatitis over scalp or over the classical sites; additionally the histopathology and investigations did not supporting any roles for seborrheic dermatitis and *Malassezia* yeast in our study.

Bacteriology and mycology examinations showed sporadic organisms which represent fractions of the resident microflora of the scalp rather than causative factors. Our observation supports previous studies that showed only the usual resident microflora.⁶ One of the limitations of this study is that we did not undertake PCR analysis to identify the organisms in the skin biopsies.

Histologically, regardless of the causative factors, the varieties of superficial folliculitis have a similar appearance. They showed intense infiltration of inflammatory cells in the follicular ostium and upper regions of the follicle. In most cases, the inflammation initially consists of neutrophils and then becomes more mixed, with the addition of lymphocytes and macrophages.²¹ Emerging data indicate that acne vulgaris is a primary inflammatory disease, with histological, immunological, and clinical evidence suggesting that inflammation occurs at all stages of acne lesion development.²² Additionally, CD3+, CD4+ T cells were elevated in the papules, perifollicular and papillary dermis.²³ In addition to the cellular structure alterations of acne, only a proportion of acne lesions contain micro-organisms and it appears that *P. acnes* is not required for the development of inflammation in acne lesions.^{24,25,26} There is some confusion with

the follicular variant of seborrheic dermatitis regarding the causative factor and the relationship to the *Malassezia* folliculitis. Nevertheless, focal parakeratosis, mounds of scale-crusts with pyknotic neutrophils on the lips of dilated follicular ostia, psoriasiform acanthosis, mild to moderate spongiosis and sparse perivascular lymphohistiocytic inflammatory infiltrate are features of acute seborrheic dermatitis.^{27,28} Numerous spores and other yeast forms through positive potassium hydroxide (KOH) will support the diagnosis of *Pityrosporum* folliculitis, although it may be difficult to distinguish these two diseases clinically from chronic non-scarring folliculitis or acne vulgaris.²⁹ Although a very rare disease, necrotizing lymphocytic folliculitis and varioliform scar are the classical presentation of acne necrotica.^{30,31} Our histopathology results support a previous study done by Hersle⁶ indicating that chronic non-scarring folliculitis is a neutrophilic disease.

CONCLUSION

Chronic non-scarring folliculitis is not a rare scalp dermatosis, but the diagnosis is challenging because of overlapping features, both clinically and histopathologically. An increased incidence among male patients and an association with oily scalp without seborrheic dermatitis or acne vulgaris, make chronic non-scarring folliculitis a unique entity. Whether it constitutes a disease entity or a variant of acne vulgaris, it deserves more thorough investigations.

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