Clinical and Sequential Histopathological Study of Scabietic and Postscabietic Nodules

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ABSTRACT:

BACKGROUND:

Scabietic nodules are common problem seen before and after effective therapy of scabies that might persist for months.

OBJECTIVE:

To evaluates the clinical and histopathological features of these nodules during their sequential course.

PATIENTS AND METHODS:

Patients with scabietic nodules were enrolled in this study. Five (14.7%) patients had active scabies at the time of consultation. All recruited patients had personal and family history of treated scabies with persistent itchy nodules. Patients were fully examined for: sites, numbers and sizes of the persistent scabietic nodules. Histopathological evaluation was done from nodules in patients with active scabies before therapy and at different times during the course of the post-scabietic nodules .

RESULTS:

Thirty four male patients were studied with mean age (34.41±16.72) years. The lesions were more prevalent in young adult age group 20-29 (24.5±2.9) years. The nodules had persisted for a period ranged from 1-52(13.47±14.29) weeks. Intolerable itching was evident in all these nodules but without the nocturnal accentuation. The number of nodules ranged from 1-35(8.5±6.8) lesions. These nodules were more heavily involving: scrotum in 20(28.57%) patients and penile shaft 19 (27.14%), and less commonly involving the upper thigh, lower abdomen, axilla and penile corona. Differential white blood cells count revealed normal eosinophilic count in all patients with post scabeitic nodules, while high values were observed in 4out of 5 patients with active scabies.The histopathology of scabietic and post-scabietic nodules revealed: acanthotic epidermis with mild spongiosis, pseudoepithelial hyperplasia present in 2(5.8%) nodules. The infiltrate was mainly diffuse (papillary and reticular dermis) dense lymphocytic in 29 (85.2%) nodules and even in early stages, the density of the infiltrate decline when the nodules persisted more than 6 months. Scattered eosinophils were present in the dermis of all nodules regardless the age of nodule. Mild lymphocytic vasculitis recognized in 3 (8.8%) nodules in patients with short duration (3-9 weeks). Granulomatous reaction with Langhans giant and epitheliod cells was another important finding in4 (11.7%) nodules.

CONCLUSION:

Scabietic nodules tend to affect male adult with a predilection to the scrotum and penile shaft. The histopathological pictures consisted mainly of acanthotic epidermis and diffuse dense dermal lymphocytic infiltrate in 85% of scabietic nodules. No mites or mite parts could be detected. Lymphocytic vasculitis and granulomatous reactions present in few nodules.

KEY WORDS: scabietic nodules, postscabietic nodules.

INTRODUCTION:

Human scabies is an intensely pruritic skin infestation caused by the host-specific mite, *Sarcoptes scabiei var hominis*.[1] Copulation occurs in a small burrow excavated by the female. After copulation, the fertilized female enlarges the burrow and begins egg lying, while the male mites die. The female mite burrow can impeded into the stratum corneum within 20 minutes.[2] Indurated, inflammatory nodules occur occasionally, particularly on the axilla, groins, scrotum and penis. They are intensely itchy, and may persist for weeks or months after the scabies has been effectively treated.[3]

Clinical features of post-scabetic nodules or nodular scabies can be summarized:

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1.There is a history of definitive or presumptive scabies which had been treated.
2. Papulonodular lesions may occur in non-scabetic distribution.
3. Pruritus (itching) may be severe in the early stage but mild to absent in the late stage.

Anti-scabetic regimens are ineffective, and the disease can persist over one year, although a good response to topical high potency corticosteroid or intralesional injection.[4] Histological changes seen in the scabietic nodules may simulate lymphoma. If there is hitological resemblance to lymphoma, the term **pseudolymphoma** was used in the past .[5]

So, the aim of the present study is to evaluate the clinical and histopathological features of these nodules during their sequential course.

PATIENTS AND METHODS:

This observational clinical and histopathological study was done in Department of Dermatology and Venereology -Baghdad Teaching Hospital, Medical City; Baghdad; Iraq during the period from April 2008- October 2009.

Any patients with scabietic nodules were enrolled in this study, with a definitive history of scabies, and treated with different modalities of scabicide. Five patients had active scabies at the time of presentation. The diagnosis was confirmed by the presence of burrows in the predilection sites of involvement. Twenty nine patients had no active scabies at the time of attending the consultation. All recruited patients had personal and family history of treated scabies with persistent itchy nodules.

Relevant data was recorded for all patients regarding: name, age, sex, occupation, residence, and previous personal and family history of scabies. They were fully examined for the sites, numbers, and sizes of the persistent scabietic nodules. Patients were also examined for the presence of BCG scar as indicator of their good immunity.

Formal consent was taken from each patient after full explanation about the nature of the present study. Ethical approval was performed by the Scientific Council of Dermatology and Venereology-Iraqi Board for Medical Specializations

Excisional biopsies were taken from scabietic nodules before therapy and from postscabietic nodules at different times during their course. These biopsies were processed for histopathological examination and stained with Hematoxylin – Eosin stain. The epidermis was evaluated for the presence of hyperkeratosis, hypergranulosis, acanthosis, pseudoepithelial hyperplasia, exocytosis and spongiosis.

The epidermodermal junction was evaluated for the following changes: basal layer liquefaction and blistering changes.

The dermis was evaluated for the following changes: presence and type of cellular infiltrate (lymphocyte, histeocyte, eosinophil, and neutrophile). Intensity of the infiltrate which is graded subjectively into mild, moderate, and dense, whether it is superficial or deep, vasculitis ,granulomatous reactions, Presence of the mite, mite parts, and ova.

Differential blood counts were carried out for twenty patients, all five patients with active scabies have been recorded and the other 15 patients were inactive regarding generalized scabies (post scabietic nodules). Normal eosinophilic count is 1 – 6% of the total white blood cells count.[156]

Photograph was taken by Sony (Cybershot 6.0mega pixels).

RESULTS:

Thirty four patients with scabietic nodules were seen in this study. All patients were males. Their age ranged from 1.5-65years with a mean ±SD of 34.41±16.72years (Table-1).

The lesions were more prevalent in young adult age group 20-29 years with a mean ±SD of 24.5±2.9years. The nodules started to appear simultaneously with onset of scabies but did not resolve after the infestation had been eradicated efficiently with different modalities of scabicide. In this study the nodules tended to persist for a period ranged from 3-52weeks with a mean ±SD of 13.47±14.29 weeks (Table-2). Intolerable itching was evident in all these nodules but without the nocturnal accentuation.The number of nodules varied from patient to patient, in general the number range from 1-35 lesions with a mean ±SD of 8.5±6.8 lesions (Table-3).

Their sizes arranged between 0.5cm–2cm (mostly< 1cm)(71.2%).These nodules were more heavily involving :scrotum in 20 (58.8%) patients (Figure-1), penile shaft 19 (55.8%) and less commonly involving the upper thigh, axilla (anterior fold), lower abdomen and penile corona (Table-4).

Differential white blood cells count revealed normal eosinophilic count in patients with post scabeitic nodules , high values were observed in 4 out of the 5 (80%) patients with active scabies. BCG scar was positive in thirty patients. Four patients did not show any scar and these were old age patients more than 50 years old and they possibly did not receive the vaccine.

Histopathological findings:

The histopathology of scabietic nodules was variable and depends mainly on the timing of

biopsy. In this study the histopathology of these nodules were recorded according to their duration. The description of the histopathological events begin from the nodules with 1 week age in patients with active scabies .The histopathological picture of post-scabietic nodules were also recorded from 3 weeks age and till about 1 year age. No scabies mite parts were seen in any nodules.

Scabeitic nodules with 1 week duration: skin sections from these 5 patients revealed the following histopathological findings:

1) The epidermis with mild acanthosis, spongiosis and basilar hypermelanosis.

2) The upper dermis showed dense inflammatory infiltrate consist from lymphocytes and histiocytes. Few eosinophils were present (scattered).

Post-scabeitic nodules with 4weeks duration: skin sections from these 8 patients revealed the following histopathological changes:

1) Acanhotic epidermis, foci of spongiosis, two lesions showed focal basal liquefaction.

2) The dermis showing moderately to intense chronic inflammatory cell infiltrates mainly lymphohistiocytic involving the papillary and reticular dermis, few plasma cells and scattering eosinophils still present.

3) Granulomatous reaction with epitheliod cell found in one nodule.

4) Two nodules showed lymphocytic perivascular infiltrate with damage to the endothelial cells considered to be mild lymphocytic vasculitis.

Post-scabietic nodules with 8 weeks duration: skin sections from these 8 patients revealed the following:

1) The epidemis was hyperkeratotic, acanthotic, and spongiotic with focal basal liquefaction changes present in two nodules.

2) Dense lymphohistiocytic infiltrate mainly perivascular involving the whole dermis, few eosinophils found in two nodules and plasma cells in another two nodules.

3) Granulomatous reactions were presents in two of these nodules.

4) One nodule showed mild lymphocytic vasculitis.

Post-scabietic nodules with 13weeks duration: skin sections from these 4 patients showed:

1) Hyperkeratosis, hypergranulosis, acanthosis, and mild spongiosis. Basal layer liquefaction present in two nodules .Pseudoepithelial hyperplasia found in another two nodules.

2) Superficial and deep dermal inflammatory infiltrate mainly lymphocytic (big lymphoid cells in one nodule). Scattered eosinophils were seen in three nodules. Histiocytes present in a less manner, with few plasma cells found in one nodule.

3) Granulmatous reactions with giant cells seen in one section.

4) Capillary proliferation was observed in one nodule.

Post-scabietic nodules with 26weeks duration: skin sections from these 4 patients represented the following:

1) Acanthotic epidermis.

2) Heavy diffuse dermal mononuclear cells infiltrate (lymphoid) in all sections, scattering eosinophils seen in two nodules.

Post-scabietic nodules with 43weeks duration: skin sections from these 3 patients demonstrated the following changes:

1) Acanthotic epidermis.

2) moderate dermal inflammatory cells infiltrate (lymphohistiocytic) in the papillary and reticular dermis.

3) Capillary proliferation in the papillary dermis.

Post-scabeitic nodules with 52weeks duration: skin sections from these 2 patients revealed the following histopathological changes:

1) Compact hyperkeratosis, irregular acanthosis (pseudoepithelial hyperplasia).

2) Perivascular and periappendegial lymphocytic infiltrate few histiocytes, no eosinophils, and no plasma cells.

3) Collagen deposition was noted in the deep dermis in one nodule.

We can conclude the following histopathological picture of post-scabietic nodules:

1) The epidermis with hyperkeratosis in three nodules (8.8%), acanthosis (100%), spongiosis in 73.5% nodules with duration less than 6 months, and pseudoepithelial hyperplasia in 2 (5.8%) nodules (**Figures 2**,

3) The epidermodermal junction showed basal layer liquefaction in 6 (17.6%) nodules with duration between (1–3 months).

The dermis showed diffuse dense lymphocytic infiltrate involving the papillary and reticular dermis in 29 (85.2%) nodules - Scattered eosinophils present in all nodules regardless the age of nodule (**Figure-3**).Histiocyte present in all nodules with decline density in nodules with long duration (3months-1year).Vasculitis was recognized in 3nodules (8.8%) with short duration (3weeks - 2months). Granulomatous reaction with langhans giant cells and epitheliod cells present in 4 nodules (11.7%) with duration ranged from 1 -3 months.

DISCUSSION:

Scabies is a common dermatological problem and there is dramatic change in the epidemiology of scabies in Iraq, as it was rare before 1980 but after

that repeated epidemics had occurred with fluctuation in the incidence as a result of repeated wars. Hence repeated exposures may change the pattern of immunological reaction to these different scabietic antigens; accordingly the clinical and histopathological pattern might change from now and then. The post-scabietic nodules are also common, and often resistant to treatment. The frequency of post-scabietic nodules in this study is commonly noticed in adult age group (20-29 years) (49%) and uncommon in children (2.94%). This is compatible with previous Iraqi study (Sharquie KE and Samer AD; 1997) found the same age group involvement.(6) While, Hogan DJ;2008, found the frequency as particularly common among young children.[7] Hashimoto K.2000, found this more common in infants. (4)

Although scabies is distributed equally in both sexes (7), however in the present work, only male patients were seen. This may be due to the selection of patients. In the present work, these nodules mostly observed in the scrotum and penile shaft while another areas were less frequently involved such as thigh, axilla, lower abdomen, and penile corona. This distribution of the post-scabietic nodules was in agreement with the Iraqi and other published studies.(4.5.7).

Most authors have described the histopathology of post-scabietic nodules similar to persistent arthropod bites or stings; a histologic picture resembling lymphoma.[4]This post scabietic nodules was among the differential diagnosis of pseudolymphoma.(5)In the present study, the histopathological picture of post-scabietic nodules showed:

1-The epidermis with hyperkeratosis (8.8%),acanthosis(100%), spongiosis(73.5%) and pseudoepithelial hyperplasia (5.8%).

2-The epidermodermal junction changes revealed basal layer liquefaction (17.6%).

3-The dermal infiltrate is mainly diffuse dense lymphocytic in all sections of scabietic nodules and post scabietic nodules (even these with short duration of development (85.2%) reaching the degree of similarity to lymphoma. The density of the infiltrate was declined when the nodules persisted more than 6 months. (4) No mite or mite parts could be detected. Mittal RR 1997, describe the histopathology of post-scabietic nodules as: Marked acanthosis in 100% with pseudoepitheliomatous hyperplasia in 8%, moderate to intense inflammatory infiltrate in dermis which was arranged as lymphoid follicles in 32% with admixture of eosinophils and plasma cells.(8)

While, Sharquie KE 1997 et al; showed the following histopathological changes:(1) the epidermis with acanthosis, spongiosis, eosinophilic epidermal invasion.(2) focal liquefactive degeneration of basal layer observed in many patients.(3) the dermal changes consist mainly of heavy mixed cellular infiltrate composed of lymphocytes , histiocytes, and eosinophils involving the superficial and deep dermis . Tissue eosinophilia were marked in most sections and sometimes forming a mass that could be called eosinophilioma.(4) No mite or mite parts could be detected .(6)

In this study, eosinophils were scanty, scattered and present in few lesions, even in earlier lesions with short duration. Hashimoto K.2000, also found the same result about eosinophils which were scarce or absent in most infiltrations, particularly in late stage nodular lesions.(4)

In the present work mild to moderate vasculitis was recognized in nodules with short duration. This was in contrast to Liu HN et al 1992, who considered that vasculitis may be a late event in the development of scabietic nodules and found immuno-reactants deposition on the blood vessels , this deposition may be only secondary to inflammation instead of a specific type II immunologic reaction to scabies.(9) Granulomatous reaction with langhans giant and epitheliod cells is another important finding in younger aged nodules. In those with granulomatous reactions neither ova nor mite parts could be detected.

Table 1:The frequency and distribution of cases by their age groups.

Age groups	Number of patients
1 - 9 years	1(2.94%)
10 - 19 years	5(14.70%)
20 - 29 years	10(29.41%)
30 - 39 years	7(20.58%)
40 - 49 years	3(8.82%)
50 - 59 years	5(14.70%)
60 - 69 years	3(8.82%)
Total	34(100%)

Table 2: The frequency and distribution of nodules by their duration.

Duration of nodules	Number of patients
1 week	5(14.70%)
4 weeks	٨(%٢٣,٥٢)
8 weeks	8(23.52%)
13 weeks	4(11.76%)
26 weeks	4(11.76%)
43 weeks	3(8.82%)
52 weeks	2(5.88%)
Total	34(100%)

Table 3:The frequency and distribution of nodules by their numbers.

Number of nodules	Number of patients
1 – 10	18 (52.94%)
11 - 20	8 (23.52%)
21 - 30	6 (17.64%)
31 - 40	2 (5.88%)
Total	34 (100%)

Table 4:The frequency and distribution of nodules by their sites.

Site of nodules	Number of nodules	Number of patients
Scrotum	70 (33.65%)	20 (58.8%)
Penile shaft	63 (30.28%)	19 (55.8%)
Thigh	21 (10.09%)	9 (26.5%)
Axilla(anterior fold)	21 (10.09%)	8 (23.5%)
Lower abdomen	17 (8.17%)	7 (20.6%)
Penile corona	16 (7.69%)	7 (20.6%)
Total	208 (100%)	34 (100%)

Figure1: Multiple post-scabietic nodules in the scrotum.

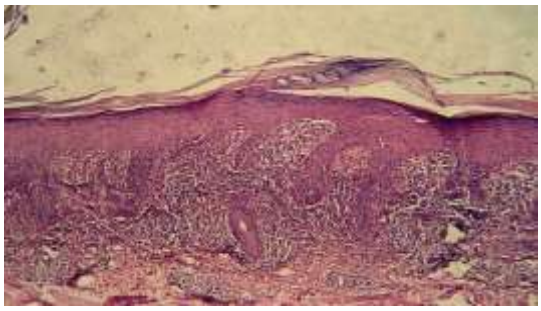

Figure 2: Diffuse dense dermal lymphocytic infiltrate.

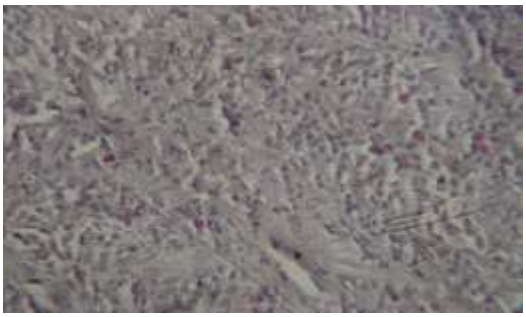

Figure 3: Scattered eosinophils.

CONCLUSION:

Scabietic nodules tend to persist as long as one year and affect mostly male adult age group with a predilection to the scrotum and penile shaft. The histopathological pictures consist mainly of acanthotic epidermis and diffuse dense dermal lymphocytic infiltrate in 85% with scattering eosinophils in all sections. No mites or mite parts could be detected. Lymphocytic vasculitis and granulomatous reactions with giant cells is another important finding.

REFERENCES:

1. Burkhart C, Burkhart C, Burkhart K.:An epidemiologic and therapeutic reassessment of scabies,cutis2000;65:233-40.
2. Huynh TH, Norman RA: Scabies and pediculosis. Dermatol Clin , 2004;22:7.
3. Burn .D .A .Diseases caused by arthropods and other noxious animals .In:Burns T ،.Breathnach S ،.Cox N ،.Griffiths C . .Rooks Text Book of Dermatology.7th ed .Blackwell Science 2004;33;37-247.
4. Hashimoto K, Fujiwara K, Punwaney J, DiGregorio F, Bostrom P, el-Hoshy K, Aronson PJ, Schoenfeld RJ Post-scabetic nodules. J Dermatol .2000;27:181-94.

5. Cutaneous lymphoid hyperplasia,cutaneous T-Cell lymphoma , other malignant lymphomas , and Allied diseases.In:James W.D., Berger T.G., Elston D. M. Andrew's Diseases of The Skin . Clinical Dermatology.10th ed. Elsevier Inc, 2006;32:725.

6. Sharquie E. K. and Samer A. D. Post-scabietic allergic nodules, Clinical and Histopathological study. J. Pan Arab League of Dermatology.1997;8:29-35.

7. Hogan.D.J, Vinson.R.P, Krusinski.P, Gelfand.J.M. James.W.D. Scabies. E-medicine .2008;15:5.

8. RR Mittal, SP Singh, Reeta Dutt, Seema Gupta, Seth. Comparative histopathology of scabies versus nodular scabies. Indian Journal of Dermatology, Venerology, and Leprology. 1997;63:170-72.

9. Liu HN, Sheu WJ, Chu TL. Scabietic nodules: a dermatopathologic and immunofluorescent study. J Cutan Pathol. 1992;19:124-27.