



Journal of the Turkish Academy of Dermatology

Volume: **15** | Issue: **4** | December **2021**

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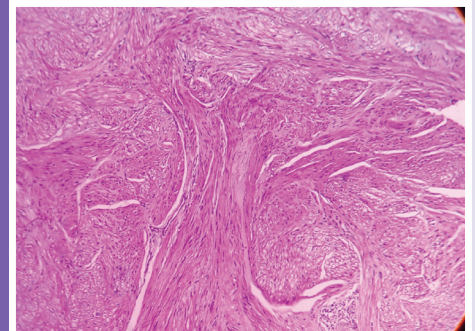
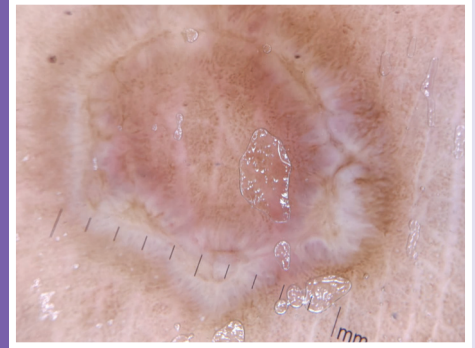
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Doger FK, Dikicioglu E, Ergin F, Unal E, Sendur N, Uslu M. Nature of cell kinetics in psoriatic epidermis. *J Cutan Pathol* 2007; 34: 257-263. PMID: 17302610

Book: - Monsel G, Delaunay P, Chosidow O. Arthropods. In: Griffiths C, Barker J, Bleiker T, Chalmers R, Creamer D, editors. *Rook's Textbook of Dermatology*, 9th ed. Singapore: Blackwell Science; 2016. p. 32-34.

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DOI: 10.4274/jtad.galenos.2021.97269

J Turk Acad Dermatol 2021;15(4):88-90

Approach to Palmoplantar Pustulosis

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ABSTRACT

Palmoplantar pustulosis is disease that manifests with grouped sterile pustules on the palms and soles. The disease manifests itself with recurrent grouped sterile pustules on a erythematous and keratotic basis, located on the palms and soles. The lesions may extend to the dorsum or the lateral aspects of the feet and hands. Various diseases can be considered in the differential diagnosis of the disease including pompholyx, dermatophyte infectious, scabies, insect bite, gonococcal infection, syphilis, palmoplantar psoriasis and acrodermatitis continua hallopeau. Treatment of the disease starts with general measures which are smoking cessation, use of emollients and avoiding irritants. First line treatment modalities are topical corticosteroids, oral retinoids and phototherapy.

Keywords: Diagnosis, Palmoplantar pustulosis, Treatment

Introduction

Palmoplantar pustulosis is disease that manifests with grouped sterile pustules on the palms and soles. The inflammation is at the level of acrosyringium. In 1980, palmoplantar pustulosis was first described as a subtype of pustular psoriasis by Barber. However, in 2007, it was accepted as a separate disease entity by the International Psoriasis Society [1].

Later the disease has been divided into two groups even though there is still ongoing discussion about the description of the disease. Disease type A was first reported by Andrews; the vesicles are preceded by pustules and it has a rare association with plaque type psoriasis. Disease type B was first reported by Barber, the pustules occur without vesicles and it has a frequent association with plaque type psoriasis. The pustules are small in type A whereas they are large in type B. Both subtypes have a female predominance and are associated with smoking [2].

Clinical Features

The disease manifests itself with recurrent grouped sterile pustules on a erythematous and keratotic basis, located on the palms and soles. The lesions may extend to the dorsum or the lateral aspects of the feet and hands. The lesions are painful, which decreases the quality of life of the patients. A 90% plaque psoriasis occurrence rate has been reported in certain series. The lesions have a recurrent and chronic course, often treatment resistant. The third and fifth decades are the most common ages. The dermoscopy of the lesions show yellow structureless areas, which correspond to the pustules, dense interfollicular white desquamation and linearly arranged glomerular vessels. The nail findings that may be seen are onycholysis, pitting, splinter hemorrhages, subungual pustules and dystrophy [3].

In a study investigating the clinical characteristics of 48 palmoplantar pustulosis patients, a female predominance was observed: 33 females and 15 males. Seventy-two percent of the patients have a history of an



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Received: 28.10.2021 **Accepted:** 25.11.2021

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average of 20 years pack/year cigarette use. Smoking was significantly more in male patients ($p=0.044$). Forty-two percent of the patients had dental fillings, and of these patients two had positivity for nickel in patch testing. Six of the patients had occupational exposure history: 2 were cleaning staff, 2 were working at construction, 1 was hairdresser and 1 was tailor. None of the patients had a history of psoriasis; two of the patients had a family history of palmoplantar psoriasis. Seven of the patients presented with nail findings. Nine of the patients had musculoskeletal manifestations and four of the patients had autoimmune thyroiditis [4].

SAPHO syndrome is a syndrome related with palmoplantar pustulosis. Its components are synovitis, acne, palmoplantar pustulosis, hyperostosis and osteitis. Palmoplantar pustulosis patients with musculoskeletal manifestations should be searched for the SAPHO syndrome [5].

The known risk factors for palmoplantar pustulosis are female gender, smoking, autoimmune thyroiditis, allergic contact dermatitis due to nickel or other topical agents (via Koebnerisation), upper respiratory tract infections (via autoreactivity), CARD14 and IL36RN mutations [2]. The disease severity increases as the year or number of packages cigarette smoking increases ($p=0.003$). The severity of lesions was less in patients on ibuprofen treatment ($p<0.01$). A significant relationship between comorbidities and lesion severity was not found [6].

As for the demographic factors, a study investigated the association of clinical and demographic factors with the severity of palmoplantar pustulosis in 203 patients. Severe disease was found to be associated with female gender, earlier disease presentation and smoking. The disease severity decreases dramatically with the cessation of smoking [7].

Histopathology

The histopathology of the disease shows epidermal sterile pustules, acanthosis, parakeratosis and inflammatory infiltrate [8].

Differential Diagnosis

The differential diagnoses of a patient applying to the clinic with palmoplantar pustules and vesicles are [9]:

- Pompholyx → contact to allergens, duration of symptoms, pruritus and or burning should be questioned.
- Dermatophyte infections (tinea pedis) → potassium hydroxide analysis should be performed.
- Scabies → should look for silion or tunnels, dermoscopy and skin scrapings should be performed.
- Insect bite → history of outdoor exposure should be questioned.
- Disseminated gonococcal infection → generalised lesions, fever and arthralgia should be questioned.

- Second stage of syphilis → syphilitic chancre, other second stage lesions and history of suspicious intercourse should be questioned.
- Palmoplantar psoriasis → other psoriatic lesions should be examined.
- Acrodermatitis continua hallopeau → only one finger is involved.

Treatment

Treatment of the disease starts with general measures which are smoking cessation, use of emollients and avoiding irritants. First line treatment modalities are topical corticosteroids, oral retinoids and phototherapy [9].

Topical corticosteroids is the safest and most commonly used treatment modality for palmoplantar pustulosis. Clobetasol propionate (0.05% cream) or triamcinolone (0.1% cream with occlusion) twice daily for one month is recommended as first line treatment. Topical anthralin, topical retinoids and topical calcipotriol can also be used even though they are not accepted as first line treatment modalities [9].

Systemic retinoids are the treatment of choice in patients who do not respond to topical treatment modalities. Acitretine can be initiated at a dose of 25 mg/day and increased to 50 mg/day in patients who tolerate the side effects. Three months of treatment is recommended and physicians should be watchful for the possible retinoid side effects [10]. Alitretinoin is another systemic retinoid drug that can be used in the treatment of palmoplantar pustulosis. It was found to be therapeutically as efficient as acitretine, psoralene plus ultraviolet-A (PUVA) or acitretine plus PUVA [11].

Phototherapy is also useful in the treatment of palmoplantar pustulosis. Localised PUVA is the most commonly used phototherapy modality; three times weekly for at least 12 sessions. Narrow band ultraviolet-B, excimer laser and photodynamic treatment are also helpful. Retinoids plus PUVA is recommended as a second-line treatment [9].

Other treatment alternatives are oral tetracyclines, cyclosporine, methotrexate, colchicine, itraconazole, tonsillectomy and diet deprived of gluten. The biologic treatment modalities are also considered in refractory cases; the previously reported biologics are ustekinumab [anti-interleukin (IL)-12/23], guselkumab (anti-IL-23), infliximab [anti-tumor necrosis factor (TNF)], etanercept (anti-TNF), adalimumab (anti-TNF), sekukinumab (anti-IL-17) and brodalumab (anti-IL-17) [9].

Guselkumab is a antibody drug that targets IL-23. T-helper 17 cells and IL-23 pathways are present in the pathogenesis of palmoplantar pustulosis. An 11 centered study in Japan investigated the use of guselkumab in the treatment of palmoplantar pustulosis. The patients were treated with 200 mg subcutaneous injections on weeks

0 and 4; and evaluated on weeks 16 and 24. Guselkumab was found to be effective in the treatment of palmoplantar pustulosis. The side effects were nasopharyngitis, headache and contact dermatitis [12]. Ustekinumab is an inhibitor of the p40 subunit of IL-12 and IL-23 which have a role in the Th17 pathway as well. Nine patients received subcutaneous injections of ustekinumab 45 mg on weeks 0 and 4. Complete resolution of the lesions was observed on week 16. Ustekinumab is a safe and effective treatment modality in the treatment of palmoplantar pustulosis [13].

The inhibition of the Jannus kinase (JAK) pathway is an inhibitor of the IL-8 pathway. Previously, the inhibition of IL-8 was found to decrease the symptoms of palmoplantar pustulosis. A 45 years old female patient with refractory palmoplantar pustulosis lesions and psoriatic arthritis was treated with tofacitinib (JAK inhibitor, 10 mg/day, oral). The lesions subsided starting from the second week of treatment. Thus, tofacitinib is also a treatment alternative for palmoplantar pustulosis [14].

Ethics

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: D.Ö., T.K.U., Design: D.Ö., T.K.U., Data Collection or Processing: D.Ö., T.K.U., Analysis or Interpretation: D.Ö., T.K.U., Literature Search: D.Ö., T.K.U., Writing: D.Ö., T.K.U.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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DOI: 10.4274/jtad.galenos.2021.83007

J Turk Acad Dermatol 2021;15(4):91-100

Major Outbreak of Dermatophyte Infections Leading Into Imitation of Different Skin Diseases: Trichophyton Mentagrophytes is the Main Criminal Fungus

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ABSTRACT

Background: It is well known that fungal skin infections lead into different clinical presentations but when some countries face epidemic or outbreak of infection, this will lead into more confusions in clinical presentation, so more new odd clinical faces of the disease.

Materials and Methods: This is a case series study where 500 cases with misdiagnosis or suspicion of different skin diseases but with suspicion of fungal skin infections that presenting with unusual clinical pictures were collected during the period from 2016-2021 years. Skin samples from lesions of the cases including scales and hair were collected and examined by direct microscopic examination. In addition, skin scraping and hair were taken from 92 patients (as a sample for culture and/or polymerase chain reaction) with suspicion and misdiagnosis of dermatophyte infections during the period from April to December 2019, for mycological diagnostics and sequencing.

Results: This study included 500 patients, 298 (59.6%) male and 202 (40.4%) females with varying types of dermatophyte infections. All patients had atypical clinical presentations with prior misdiagnosis of different non-fungal skin diseases. Dermatophyte infections were mimicking the following diseases: Psoriasis-like lesion (50.2%) was the most common clinical presentation while dermatitis-like seen in 107 (21.4%) patients, photosensitivity-like in 24 (4.8%) cases, keratoderma in 17 (3.4%), seborrheic dermatitis-like in 14 (2.8%), napkin dermatitis-like in 12 (2.4%), folliculitis-like in 12 (2.4%), rosacea-like in 12 (2.4%), moth eaten alopecia in 11 (2.2%), lupus erythematosus-like in 10 (2%), discoid lupus erythematosus-like in 8 (1.6%), granuloma annularae-like in 4 (0.8%), pityriasis alba-like in 3 (0.6%) and others.

Conclusion: Iraq is running major outbreak of dermatophyte infections that have bizzare clinical pictures and imitating many skin diseases commonly psoriasis, dermatitis, photosensitivity and keratoderma. Trichophyton mentagrophytes represented the most frequent dermatophyte that has been isolated.

Keywords: Atypical presentation, Dermatophytosis, Zoophilic, Anthropophilic

Introduction

Dermatophytes are the most common agents of superficial fungal infections all over the world and widespread in the developing countries [1].

These fungi possess affinity for keratinized tissue, and can cause superficial infections of the skin, nails and hair. Trichophyton (T), epidermophyton (E), and microsporum (M) are the three main genera of dermatophytes that cause dermatophytosis [2].



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Received: 26.09.2021 **Accepted:** 01.12.2021

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Currently, fungal infections of the skin, hairs and nails have become a common ecumenical dilemma. Havlickova et al. [3], 2008 reported that 20-25% of the world's population has skin mycoses and appeared to be a frequent form of infection.

There is no more distinguishing between zoophilic and anthropophilic fungi regarding infection to the human being. So both types can infect humans and when zoophilic infect human then human can infect another human [2].

In the last year's zoophilic fungi replacing anthropophilic fungi as the etiological pattern of dermatophytosis [4,5,6,7,8,9,10]. The incidence and distribution of this infection have been studied in different geographical areas of the world including Iraq [11,12], Kuwait [13], Jordan [14], Saudi Arabia [15], Greece [16] and Europe [17].

Dogra and Narang [18] in 2017 reported cases with unusual presentation of dermatophytosis in Indian peoples which are termed as atypical tinea. Atypical tinea can be seen even in immunocompetent patients who are not using any topical and systemic medications such as corticosteroids.

Superficial fungal infection of the skin may sometimes imitate other dermatoses and multiple atypical clinical varieties have been recorded which include eczematous dermatitis-like, psoriasis-like, impetigo-like, seborrheic dermatitis-like, erythema multiforme-like, keratoderma-like, pyoderma gangrenosum-like lupus erythematosus-like, lichen planus like, dermatitis herpetiformis-like, rosacea-like, herpes-like, and polymorphous light eruption-like [18,19,20].

There is an authentic epidemic of varieties of chronic recalcitrant cutaneous fungal infection due to *T. mentagrophytes* (TM) type VIII in India [21] and a wide variation in clinical pictures is seen. Tinea corporis, tinea faciei and tinea cruris are the most common presentations. Lesions usually show mild to severe degree of inflammation, and huge lesions with a tendency to coalesce and spread are common [22].

Numerous reports and literature recorded that TM type VIII is becoming increasingly prevalent in many countries. TM type VIII has been isolated from skin scrapings of patients in Iraq, Germany, Switzerland, Finland, Cambodia, Estonia and Iran [23,24,25,26,27].

As Iraq is running an outbreak of dermatophyte infections leading into epidemic state, new strange clinical presentations are expected. So the aim of present work is to record all abnormal and odd cases of fungal skin infections that had imitated other skin diseases.

Materials and Methods

This is a case series study carried out during the period from 2016-2021. The present study included any patients with positive potassium hydroxide (KOH) examination of the suspected

cutaneous fungal infection, those with suspected fungal infection but with negative KOH examination were excluded from the study. Patients from northern to southern Iraqi governorate were involved in the present study but the majority of the patients were from the capital Baghdad. Oral consent was obtained from each patient after explanation of the nature of the study. Close-up photographs were taken at the same place with constant distance and illumination.

Demographic data and detailed disease history were gathered from all patients. Visual inspection with appropriate light source and proper dermatological examination including woods light examination were carried out yielding different clinical types of superficial fungal infection. Family members living in the same house were also examined for any suspected skin lesions.

All cases presented with unusual clinical pictures that could be easily missed with other skin diseases. The following diagnostic parameters were applied to have higher index of suspicion in favor of fungal infections: unusual sites, scaly lesions with hair loss, bizarre forms with arches and angulations, geographical in shapes, fire in field pictures, target wavy lesions, asymmetry of lesions, psoriasis of scalps with patchy alopecia, unusual ages. Also increasing number of cases in the same family or close relatives, higher number among the same society.

The diagnosis was based on clinical features confirmed with direct microscopic examination (10-20% KOH). Skin scrapings from the edge of the lesion, infected hair, nail clippings and debris from under the edges of the infected nails were gathered. Direct microscopic examination using KOH of the skin scrapings, hair and/or nail clippings was done in all cases after immersion in 10% KOH for skin scales and hair examination and 20% KOH for nail specimens examination.

In addition, skin scraping and hair were taken from 92 patients, [as a sample for culture and or polymerase chain reaction (PCR)], with suspicion and misdiagnosis of dermatophyte infections during the period from April to December 2019. Skin scraping and hair were collected in the Center of Dermatology, Medical City Teaching Hospital, Baghdad, Iraq and sent to Laboratory of Medical Microbiology, Mlbis, Germany for mycological diagnostics and sequencing [24].

The patients were divided into several groups according to the clinical presentation: psoriasis-like, dermatitis-like, rosacea-like, photosensitivity-like, seborrheic dermatitis-like, keratoderma of palms and/ or soles and others.

Statistical Analysis

Statistical Package for Social Sciences version 23 was used for data input and analysis. Data were statistically described in terms of

mean, frequencies (number of cases), standard deviation, male to female ratio and percentage (%).

Results

This study included 500 patients with dermatophyte infections, 298 (59.6%) male and 202 (40.4%) females with varying types of dermatophyte infections, their ages ranged from 4 months-70 years with median of 30 years. The duration of the disease ranged from 2-36 months with a mean of 4 months. The number of familial house contacts were ranged from 1-30 with a median of 5 cases.

All patients had atypical clinical presentation (Figures 1-8) with prior misdiagnosis or suspicion of different non-fungal skin diseases receiving various topical and systemic therapies while KOH examination was positive for all included patients. Both by PCR and/or culture for the 92 patients, dermatophyte was detected in 63 (68%) out of 92 samples. PCR positive were 57 (90%) of 63 samples, culture positive was 43 (81%). The dermatophyte species isolated were belonged to the 3 genera T, E and M. Eight dermatophytes



Figure 1. Psoriasis like lesion of tinea on the leg of 23 years old male



Figure 2. Atopic dermatitis like lesion of tinea in 8 years old female



Figure 3. Seborrheic dermatitis like lesion of tinea on the face of 21 years old male



Figure 4. Left foot keratoderma lesion of tinea in 40 years old female

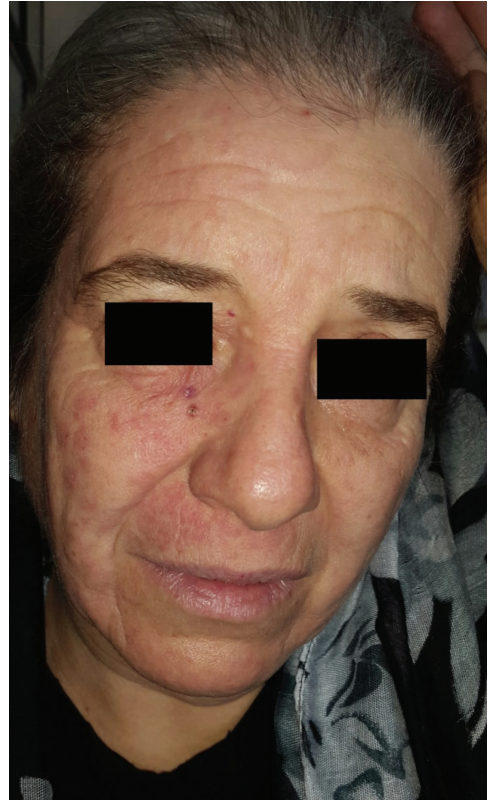


Figure 6. Rosacea like lesion of tinea in 52 years old female

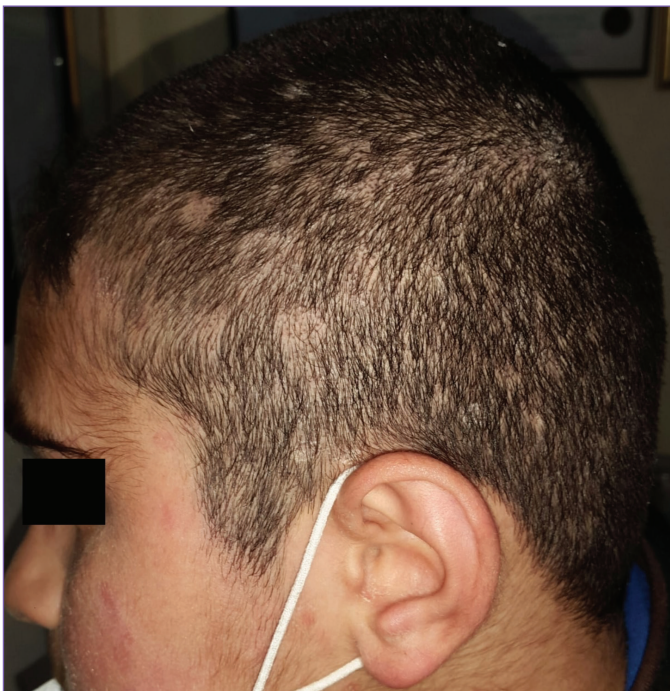


Figure 5. Moth eaten alopecia of tinea capitis in 11 years old male



Figure 7. Tinea lesions on the malar area resembling lupus erythematosus in 29 years old male

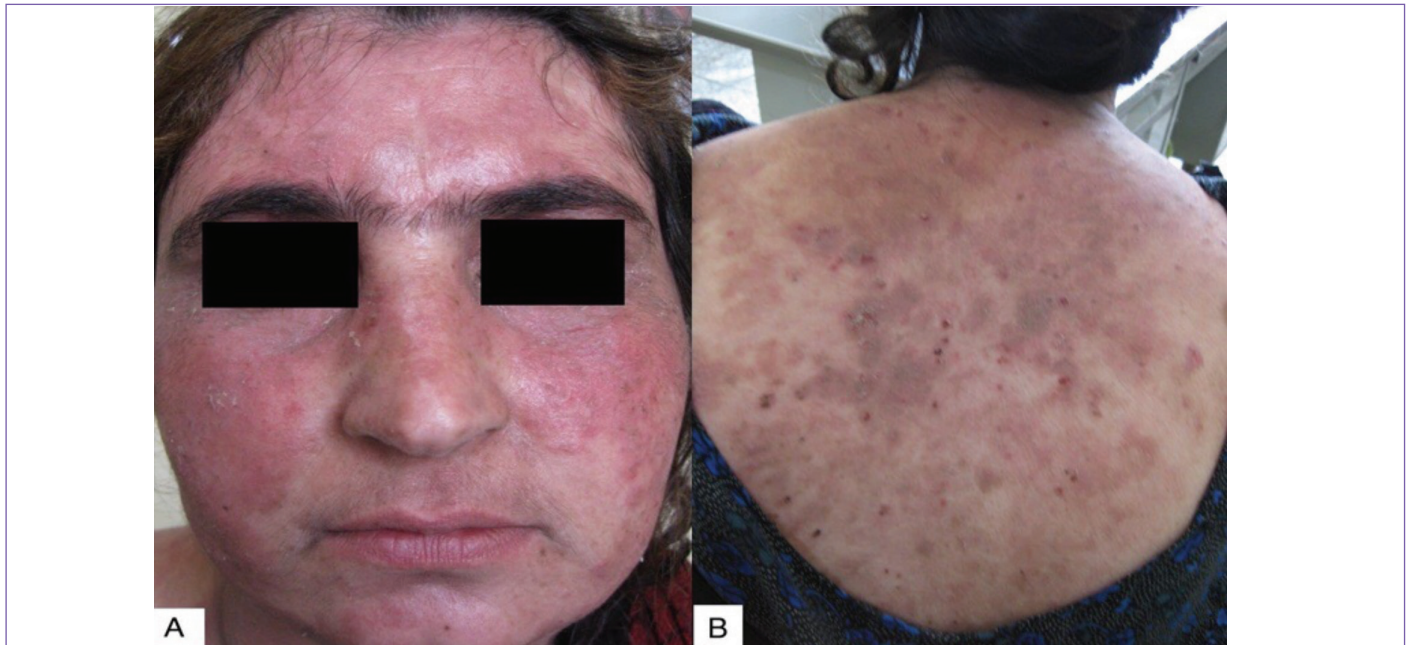


Figure 8. Pemphigus foliaceus like lesions of tinea on the face (A) and trunk (B) of 30 years old female

species were identified in specimens of 63 patients (out of 63 positive samples, 20 by PCR, 43 by culture): TM/TI, 40 (63%, 26 by culture, 14 by PCR), *M. canis*, 7 (11%, 6 by culture, 1 by PCR), *E. floccosum*, 6 (10%, each 3 by culture and PCR, respectively), *T. rubrum*, 5 (8%, 3 by culture, 2 by PCR), *T. violaceum*, 2 (3%, 2 by culture). Each one strain of *T. benhamiae* (2%), *Nannizzia incurvata* (2%), and *M. ferrugineum* (2%) was isolated. Depending on the results of sequencing, we were able to determine that among 26 cultural isolated TM strains, surprisingly, 18 were TM ITS type VIII India, 5 were TM ITS type V Iran, and 2 were belonging to anthropophilic TI ITS type II*. Seven (39%) out of 18 Indian TM ITS type VIII were terbinafine resistant [24].

The atypical pictures of the following dermatophyte infections were as follow: tinea corporis was the main fungal infection observed in 175 (35%) of cases followed by tinea faciei 124 (24.8%), tinea manuum 75 (15%), tinea capitis 59 (11.8%), tinea pedis 32 (6.4%), tinea cruris 28 (5.6%), tinea unguium 4 (0.8%) and tinea barbae 3 (0.6%) (Table 1).

So the dermatophyte infections were mimicking the following skin diseases (Table 1): Psoriasiform lesions in 251 (50.2) patients, with careful history and examination, none had history of psoriasis currently or in the past, all of them tried various topical and in many, systemic treatments, with either no response at all or a notable exacerbation in size of lesions or in their numbers that terrifying the patients and provides an important clue to search for other diagnoses in favor of dermatophyte infections. On examination, the lesions were either resembling the thick classic plaque of psoriasis, or in some patients with minimally scaly lesions in moist flexural

areas. Tinea corporis resembling resolved psoriatic lesions were also observed. The negative history of psoriasis with absence of response to various modalities of treatment was the clue to scrap these lesions and finally the accurate and treatable diagnosis of dermatophytosis was achieved.

Cutaneous dermatophyte infections presenting as dermatitis like lesions were the second most common atypical presentation affecting 107 (21.4%) patients.

Similarly, while all patients received adequate treatment for misdiagnosed tinea infection as eczema, none of them were satisfied, and in majority, the lesions either enlarge or flare again upon discontinuation of topical steroid treatments.

In all patients who presented with photosensitivity like lesion and lupus like lesions of fungal infections, the antinuclear antibody and anti-double stranded DNA (anti-dsDNA) were negative and this was the guide for searching for an alternative diagnosis, with positive KOH examination that showed spores and hyphae, the cutaneous dermatophyte infection was the ultimate diagnosis.

Discussion

A worldwide increase in superficial dermatophyte infection of skin with varying degree of local inflammation had been reported in recent years [28].

While dermatophytes found universally, the prevalence rate may vary in different geographic areas depending on environmental conditions or lifestyle. Hot and humid weather, sun exposure, low socioeconomic status, overcrowding with sharing of clothes and

Table 1. Atypical presentation, type of tinea, and sex of the patients in atypical variants of tinea infection					
Clinical presentation	Number of patients	Type of tinea	Male	Female	Percentage %
Psoriasiform lesion	251	Tinea corporis	87	35	50.2
		Tinea capitis	30	9	
		Tinea faciei	15	13	
		Tinea manuum	13	12	
		Tinea cruris	21	0	
		Tinea pedis	10	2	
		Tinea unguium	1	3	
Dermatitis like	107	Tinea manuum	12	33	21.4
		Tinea faciei	15	17	
		Tinea corporis	14	13	
		Tinea pedis	1	2	
Photosensitivity like	24	Tinea faciei	6	17	4.8
		Tinea corporis	0	1	
Keratoderma	17	Tinea pedis	11	5	3.4
		Tinea manuum	1	0	
Seborrheic dermatitis like	14	Tinea faciei	6	8	2.8
Napkin dermatitis like	12	Tinea cruris	1	6	2.4
		Tinea corporis	2	3	
Folliculitis like	12	Tinea corporis	2	1	2.4
		Tinea capitis	3	0	
		Tinea faciei	0	3	
		Tinea barbae	3	0	
Rosacea like	12	Tinea faciei	5	7	2.4
Moth eaten alopecia	11	Tinea capitis	11	0	2.2
Lupus like	10	Tinea faciei	4	2	2
		Tinea capitis	2	0	
			0	2	
Discoid lupus erythematosus like	8	Tinea corporis	4	3	1.6
		Tinea faciei	0	1	
Granuloma annulare like	4	Tinea manuum	3	0	0.8
		Tinea faciei	1	0	
Pityriasis alba like	3	Tinea faciei	2	1	0.6
Impetigo like	2	Tinea corporis	1	0	0.4
		Tinea faciei	0	1	
Herpes zoster like	2	Tinea corporis	2	0	0.4
Folliculitis decalvans like	2	Tinea capitis	2	0	0.4
Fixed drug eruption like	1	Tinea corporis	1	0	0.2
Erythrokeratoderma	1	Tinea corporis	0	1	0.2
Squamous cell carcinoma like	1	Tinea manuum	1	0	0.2
Pompholyx like	1	Tinea pedis	1	0	0.2
Pityriasis rosea like	1	Tinea corporis	1	0	0.2
Leukoderma	1	Tinea corporis	1	0	0.2
Pemphigus foliaceus like	1	Tinea corporis	0	1	0.2
Lichen planus like	1	Tinea corporis	0	1	0.2
Hyperpigmentation	1	Tinea corporis	1	0	0.2

footwear, poor hygiene and sanitary conditions, and migration of population are important contributory factors for the increasing chronic and recurrent forms of dermatophytosis [18].

In the typical circumstances, the diagnosis of superficial

dermatophyte infections is straight forward with no need for extensive or even simple laboratory investigations. Usually, the scaly erythematous patches in an annular arrangement, with peripheral enlargement and central clearing are the

typical clinical presentation. However, when superficial cutaneous dermatophyte infections presented in a challenging clinical manifestations that is, totally or at least partially, non-distinguishable from other skin pathologies, it will result in delayed diagnosis as physicians do not include dermatophyte infections in their first diagnostic options. Many published literatures highlighted on atypical presentation of these infections [18,19,29,30,31,32,33,34,35].

Although the source of the infection is mainly animals, multiple infections between family members as a result of interpersonal contact within the family were observed in the present work. This observation could confirm that zoophilic species can be transmitted from one person to another causing dermatophytes infection.

In the present work, we introduced a large number of atypical superficial dermatophyte infections that were easily missed and wrongly diagnosed with other skin diseases and were considered as imitating skin diseases. These atypical mimicking presentations were also reported by other studies [18,20,29,30,31,32,33,34,35] but the present study was the most extensive evaluation.

Though rarely reported in Iraqi literature, the atypical clinical pictures of superficial fungal infection are now being routinely seen in different Iraqi cities. Tinea has now qualified for the group of great imitator similar to syphilis, cutaneous tuberculosis, sarcoidosis, and cutaneous leishmaniasis.

Psoriasis-like lesion in its classic plaque, flexural or early resolving lesions, was the most common clinical presentation (50.2%) in our study which is inconsistent with another study in which eczema like lesion was the main clinical manifestation [20]. This observation may be due to variability in the clinical presentation of cutaneous fungal infection across the countries and even in the same country which can be attributed to host factors, climatic factors and dermatophyte species.

The present study recorded that *TM/T. interdigitale* (TI), (63%) was the most common isolated causative species. While these results agreed with many earlier studies where TM was the most common isolate from the specimens [36,37], it disagreed with many previous reports in which *M.canis* was the main causative strain of dermatophytes infection [20,38,39,40] while other studies [24,41,42] showed that *T. rubrum* was the main causative agents.

In this study, tinea corporis was the main fungal infection that observed in 35% of cases followed by tinea faciei 24.8%, tinea manuum 15%, tinea capitis 11.8%, tinea pedis 6.4%, tinea cruris 5.6%, tinea unguium 0.8% and tinea barbae 0.6%. These results were comparable to other Iraqi and international studies where tinea corporis and tinea capitis were the most prevalent clinical types [10,12,43,44]. The increased prevalence of tinea corporis and

tinea capitis can be attributed to overcrowding, sharing of personal hygiene equipments including towels, combs and shavings tools [45] and rural drainage in many studied patients. In addition, some social behaviors in the Iraqi community, handshake can play a role in spreading infection as contact is an important portal for transmission of infection.

A statistically significant relation between dermatophytes infection and gender of the patients had been observed in the present study where the dermatophytes infection was higher in males with 59.6% cases, in comparison to females with 40.4% cases. Tinea corporis, tinea capities, tinea pedis, tinea cruris and tinea barbae had been recorded with higher frequency in males than females. While, tinea faciei, tinea manuum and tinea unguium displayed higher infections in females than males. The incidence of dermatophytosis in males was more than females in many earlier studies a finding in line with the present study [12,37,46,47,48]. On the other hand, the results inconsistent with other studies where the incidence of dermatophytosis was higher in females than males [49,50,51]. This difference between dermatophytes infection and gender of the patients may be due to physiological differences between male and female, life style and the differences in the social behavior [52].

Tinea capitis was the main fungal infection of preadolescent children. This is consistent with previous studies in Iraq [40,53] and other regions of the world [10,54,55]. Boys were affected more than girls this could be due to their outdoor playing and sport activities [53,54,56,57]. But tinea capitis was not uncommonly seen among adult patients as well documented by the present work.

Tinea cruris was more abundant in males (78.57%) due to the presence of scrotum which provides warm and moist environment suitable for dermatophyte growth [58].

Tinea barbae was only the disease of males (100%) as it requires the hairy beard area of the patients.

On contrary, as the house duties are the responsibility of most women in our society, so it's not surprising to find higher frequency of tinea unguium in females (75%) than males (25%). Also, cosmetic manicuring practices undertaken by women can be considered as another explanation for this findings [59].

Surprisingly, in this study, TM constituted the most frequently recorded dermatophyte species in Iraq replacing *T. rubrum*, this observation is on line with the new emerged and mostly terbinafine resistant genotype VIII India. This can be explained by spread of TM type VIII-from India to neighboring Arab and Persian countries, e.g. Bahrain, and Iran, which facilitate their transmission to Iraq. The percentage of terbinafine resistance is high in the strains isolated in Baghdad, Iraq, so treatment failure of terbinafine are to be expected [24].

Early diagnosis of skin dermatophytosis is essential for all dermatologist particularly the lesion involving hairy areas as early and adequate treatment can prevent scarring outcome of this treatable conditions. While the atypical clinical presentation of cutaneous fungal infection described in the present study might be a new dilemma that can be added to many great imitator skin diseases, the customized and professional classification provided there, can help, at least in non-responding and recalcitrant lesions of common skin diseases, the clinician to think about of dermatophyte infection.

The ease of traveling, migration and overcrowding, displaced people which is a common problem in Iraq, the climatic conditions including high temperature and humidity and excessive washing with resultant modification of fungal growth and reproduction rate, and/or alteration in the skin barrier function, the abrupt increase in breeding pets, the incorrect diagnosis or treatment, and most importantly, the recently discovered TM type VIII in Iraqi patients with its chronic and recalcitrant nature with more ease of interfamily spread, these factors, all together, can provide robust explanation for the outbreak of dermatophyte infection in Iraq with atypical presentation.

The present work can draw an important observation that whenever the dermatophyte infection became chronic, the immunity against fungal pathogen will be very poor and the skin of these patients will behave like culture media allowing the fungal infection to spread quickly across the body skin.

Study Limitations

The present study showing large number of patients with well documented cases of atypical presentation of dermatophyte infections accordingly we think there is no limitation of the study.

Conclusion

The present study draws attention to the ability of tinea to imitate other cutaneous diseases, inviting the dermatologist not to simply trust the clinical point of view, especially when dealing with scaly erythematous dermatitis present for long duration and not respond to treatment especially topical steroids. Iraq is now running major outbreak of dermatophyte infections that have bizarre clinical pictures and mimicking many skin diseases commonly psoriasis, dermatitis, photosensitivity and keratoderma. TM represented the most frequent dermatophyte that has been isolated.

Ethics

Ethics Committee Approval: The study followed the Declaration of Helsinki Principles and it was approved by the Ethics Committee of Fallujah Teaching Hospital (approval number: 1280, date: 16/9/2021).

Informed Consent: Oral consent was obtained from each patient after explanation of the nature of the study.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: K.E.S., R.I.J., Concept: K.E.S., R.I.J., Design: K.E.S., R.I.J., Data Collection or Processing: K.E.S., R.I.J., Analysis or Interpretation: K.E.S., R.I.J., Literature Search: K.E.S., R.I.J., Writing: K.E.S., R.I.J.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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DOI: 10.4274/jtad.galenos.2021.09797

J Turk Acad Dermatol 2021;15(4):101-107

Demographic Characteristics of Sexually Transmitted Infections: Retrospective 5-year Outpatient Clinic Evaluation

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ABSTRACT

Background: Sexually transmitted infections (STIs) are a health problem that can affect both genders and they continue to be a social problem. Although it is more common in young adults, it can affect individuals of any age. The aim of our study was to evaluate the demographic characteristics of STIs.

Materials and Methods: We investigated the cases of anogenital warts, herpes genitalis, genital molluscum contagiosum, syphilis, granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle in 63,206 patients who applied to the outpatient clinic of the Dermatology Department of Istanbul University Cerrahpasa-Cerrahpasa Faculty of Medicine between 01.11.2007 and 01.12.2011.

Results: Anogenital warts was the most common disease. No records of patients diagnosed with granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle were found. Although we found pediatric and elderly patient records in our search, most of the patients were young adults. According to the evaluation of gender distribution, no statistically significant difference was found except for anogenital warts.

Conclusion: In this retrospective study, we evaluated the anogenital warts, herpes genitalis, genital molluscum contagiosum, syphilis, granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle patients that applied to our dermatology outpatient clinic; the parameters were the disease frequency, age, age distribution, gender and gender distribution by age. The frequency of anogenital warts, herpes genitalis, genital molluscum contagiosum and syphilis were 0.46%, 0.069%, 0.037% and 0.026%, respectively. The average ages of these diseases were 34.58 ± 12.64 , 33.3 ± 14.91 , 20.29 ± 12.24 , and 43.82 ± 14.16 , respectively. While men were more affected by anogenital warts and syphilis, women were slightly more affected by genital molluscum contagiosum. The results were based upon the retrospective evaluation of the patients that applied to the outpatient clinic of Istanbul University Cerrahpasa-Cerrahpasa Faculty of Medicine Dermatology Department. Further studies with longer follow up intervals and larger case series are needed to reach nation-based conclusions.

Keywords: Anogenital warts, Demographic, Herpes genitalis, Molluscum contagiosum, Sexually transmitted infections, Syphilis

Introduction

Sexually transmitted infections (STIs) are caused by the transmission of various bacteria, viruses and ectoparasites from one person to another as a result of sexual contact [1]. According to The Centers for Disease Control and Prevention, it is estimated that there are close to 20 million new STIs each year in the United States (US). In addition,

approximately half of these 20 million new cases are thought to be between the ages of 15-24 years [2]. Patients diagnosed with STIs can apply to urology and gynecology outpatient clinics as well as dermatology clinics. It was reported that more than 300,000 cases were diagnosed STI in genitourinary medicine clinics in England in 1996 [3]. In this study, we aimed to investigate the demographic



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Received: 17.10.2021 **Accepted:** 25.11.2021

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characteristics of those diagnosed with STI among the patients who applied to the dermatology outpatient clinic.

Materials and Methods

In this study, we retrospectively investigated the cases of anogenital warts, herpes genitalis, genital molluscum contagiosum, syphilis, granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle in total of 63,206 patients who applied to the outpatient clinic of the Dermatology Department of Istanbul University Cerrahpasa-Cerrahpasa Faculty of Medicine between 01.11.2007-01.12.2011. Approval of the Cerrahpasa Medical Faculty Ethics Committee was taken (13.03.2012-B.30.2.IST.0.30.11.06/109).

The diagnosis of anogenital warts, herpes genitalis and genital molluscum contagiosum were made by detailed dermatologic and genital examination. In suspected herpes genitalis cases, the diagnosis was confirmed by herpes simplex virus immunoglobulin G antibody positivity. The diagnosis of syphilis was made by performing serological tests.

In this study; frequency, age, gender and gender distribution by age were taken into account in all patients.

Statistical Analysis

The data were recorded in a computer data entry program based on the International Statistical Classification of Diseases and Related Health Problems (International Classification of Diseases) diagnostic code system and were retrospectively reviewed. The data were evaluated by statistical study.

Statistical analyzes were performed using Statistical Package for the Social Sciences V.15.0 and Number Cruncher Statistical System 2007 programs. $P < 0.05$ value was considered statistically significant. Chi-square test was applied in the analyzes and frequency tables and descriptive statistics were used.

Results

Although anogenital warts, herpes genitalis, genital molluscum contagiosum, syphilis, granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle among the STIs were included in the screening, no record of four diseases (granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle) could be found.

In this section, the findings were evaluated separately for anogenital warts, herpes genitalis, genital molluscum contagiosum and syphilis.

Anogenital Warts

A total of 63,206 patients who admitted to Istanbul University Cerrahpasa-Cerrahpasa Faculty of Medicine Dermatology Department between 01.11.2007-31.12.2011, 297 (0.46%) of them were diagnosed with anogenital warts. Of the 297 patients

diagnosed, 231 (77.8%) of them were male and 66 (22.2%) of them were female. Anogenital warts were more common in men than in women and this difference was found to be statistically significant ($p < 0.001$). The mean age of the patients was 34.58 ± 12.64 (3-88 years) years. These patients with the diagnosis of anogenital warts were divided into nine groups according to their age. The incidence of the disease showed statistically significant difference among age groups ($p < 0.001$). The age group with the highest frequency was the 30-39 age group (34.3%) and the second most frequent was the 20-29 age group (31.3%). There was a statistically significant difference among age groups in terms of gender ($p < 0.001$). While the disease was most common (36.4%) in the 30-39 age group in men, it was most common (36.4%) in the 20-29 age group in women. Of the 81.8% diagnosed patients with anogenital warts were found between the ages of 20-49 years. Gender distribution of patients with anogenital warts according to age groups is shown in Table 1.

Herpes Genitalis

Between the dates 01.11.2007-31.12.2011, out of 63,206 patients who applied to Cerrahpasa Medical Faculty Dermatology Department, 44 (0.069%) of them were diagnosed with herpes genitalis. Of the 44 patients, 22 (50%) of them were male and 22 (50%) of them were female. There was no statistically significant difference between male and female distribution ($p = 1.000$). The mean age of the patients was 33.3 ± 14.91 (1-68 years) years. These patients with the diagnosis of herpes genitalis were divided into seven groups according to their age. The incidence of the disease showed statistically significant difference among age groups ($p = 0.003$). The age group with the highest frequency was the 30-39 age group (27.3%) and the second most frequent was the 20-29 age group (25%). There was no statistically significant difference among age groups in terms of gender ($p = 0.436$). While the disease was most common (36.4%) in the 30-39 age group in men, it was most common (31.8%) in the 20-29 age group in women. Of the 75% diagnosed patients with herpes genitalis were found between the ages of 20-49 years. Gender distribution of patients with herpes genitalis according to age groups is shown in Table 2.

Genital Molluscum Contagiosum

Between the dates 01.11.2007-31.12.2011, out of 63,206 patients who applied to Cerrahpasa Medical Faculty Dermatology Department, 24 (0.037%) of them were diagnosed with genital molluscum contagiosum. Of the 24 patients, 10 (41.7%) of them were male and 14 (58.3%) of them were female. There was no statistically significant difference between male and female distribution ($p = 0.414$). The mean age of the patients was 20.29 ± 12.24 (3-48 years) years. These patients with the diagnosis of genital molluscum contagiosum were divided into five groups according to their age. The incidence of the disease showed statistically significant difference among age

groups (p=0,002). The age group with the highest frequency was the 20-29 age group (45.8%) and the second most frequency was 0-9 age group (33.3%). There was no statistically significant difference

among age groups in terms of gender (p=0.329). The disease was most frequently observed in the 20-29 age group in both gender (male: 40%, female: 50%). Out of 24 patients, 11 (45.8%) of them was

Table 1. Gender distribution of patients with anogenital warts according to age groups

		Gender		Total	
		Male	Female		
Age	0-9	Frequency	0	10	10
		%	0%	15.2%	3.4%
	10-19	Frequency	5	2	7
		%	2.2%	3.0%	2.4%
	20-29	Frequency	69	24	93
		%	29.9%	36.4%	31.3%
	30-39	Frequency	84	18	102
		%	36.4%	27.3%	34.3%
	40-49	Frequency	44	4	48
		%	19.0%	6.1%	16.2%
	50-59	Frequency	18	6	24
		%	7.8%	9.1%	8.1%
	60-69	Frequency	8	2	10
		%	3.5%	3.0%	3.4%
	70-79	Frequency	2	0	2
		%	9%	0%	7%
80-89	Frequency	1	0	1	
	%	4%	0%	3%	
Total %		Frequency	231	66	297
		%	100.0%	100.0%	100.0%

Table 2. Gender distribution of patients with herpes genitalis according to age groups

		Gender		Total	
		Male	Female		
Age	0-9	Frequency	1	3	4
		%	4.5%	13.6%	9.1%
	10-19	Frequency	2	0	2
		%	9.1%	0%	4.5%
	20-29	Frequency	4	7	11
		%	18.2%	31.8%	25.0%
	30-39	Frequency	8	4	12
		%	36.4%	18.2%	27.3%
	40-49	Frequency	4	6	10
		%	18.2%	27.3%	22.7%
	50-59	Frequency	2	1	3
		%	9.1%	4.5%	6.8%
	60-69	Frequency	1	1	2
		%	4.5%	4.5%	4.5%
Total %		Frequency	22	22	44
		%	100.0%	100.0%	100.0%

found between the ages of 20-29. Gender distribution of patients with genital molluscum contagiosum according to age groups is shown in Table 3.

Syphilis

Between the dates 01.11.2007-31.12.2011, out of 63,206 patients who applied to Cerrahpasa Medical Faculty Dermatology Department, 17 (0.026%) of them were diagnosed with syphilis. Out of 17 patients, 10 (58.8%) of them were male and 7 (41.2%) of them were female. There was no statistically significant difference between male and female distribution (p=0.466). The mean age of the patients was 43.82±14.16 (20-78 years) years. These patients with the diagnosis of syphilis were divided into six groups according to their age. The incidence of the disease showed statistically

significant difference among age groups (p=0.017). The age group with the highest frequency was the 30-39 age group (47.1%) and the second most frequency was 50-59 age group (23.5%). There was no statistically significant difference among age groups in terms of gender (p=0.342). While the disease was most common (60%) in the 30-39 age group in men, it was most common (42.9%) in the 50-59 age group in women. Out of 17 patients, 14 (82.4%) of them were found between the ages of 30-59 years. Gender distribution of patients with syphilis according to age groups is shown in Table 4.

Discussion

STIs continue to be a serious public health problem worldwide for years [4]. It is estimated that there are approximately 19 million

Table 3. Gender distribution of patients with genital molluscum contagiosum according to age groups

		Gender		Total	
		Male	Female		
Age	0-9	Frequency	2	6	8
		%	20.0%	42.9%	33.3%
	10-19	Frequency	1	0	1
		%	10.0%	0%	4.2%
	20-29	Frequency	4	7	11
		%	40.0%	50.0%	45.8%
	30-39	Frequency	2	1	3
		%	20.0%	7.1%	12.5%
	40-49	Frequency	1	0	1
		%	10.0%	0%	4.2%
Total %		Frequency	10	14	24
		%	100.0%	100.0%	100.0%

Table 4. Gender distribution of patients with syphilis according to age groups

		Gender		Total	
		Male	Female		
Age	20-29	Frequency	0	1	1
		%	0%	14.3%	5.9%
	30-39	Frequency	6	2	8
		%	60.0%	28.6%	47.1%
	40-49	Frequency	1	1	2
		%	10.0%	14.3%	11.8%
	50-59	Frequency	1	3	4
		%	10.0%	42.9%	23.5%
	60-69	Frequency	1	0	1
		%	10.0%	0%	5.9%
	70-79	Frequency	1	0	1
		%	10.0%	0%	5.9%
Total %		Frequency	10	7	17
		%	100.0%	100.0%	100.0%

new STI cases in the US and approximately 300 million new STI cases in the world every year [2,5]. Similarly, the incidence of STIs in developed countries of Europe has been increasing for the last 20 years [6].

Although adolescents and young adults are the high-risk group for STIs, it is important to consider the possible risk of STIs in the elderly population as well. Most elderly patients continue to have heterosexual or homosexual relationships despite their advancing age [7]. About half of the new cases observed each year in the US are composed of young people aged 15-24 years [8]. In our study, in accordance with the literature data, STIs rates were higher in young adults than in the elderly population.

Human papilloma virus (HPV) infections are the most commonly diagnosed STI [9]. In our study, the most frequently diagnosed STI among the diseases we screened was anogenital warts. Of the 63,206 patients included in our study, 297 (0.46%) of them were diagnosed with anogenital warts. The data we obtained in terms of frequency were found to be lower than we expected. This may be due to the fact that male and female patients refer to the non-dermatology clinics, such as urology and the gynecology clinic. Other possible reasons for the lower frequency of the disease than we expected could be that Turkish individuals felt themselves under public pressure in terms of diseases affecting the genital area, and thus did not apply to the hospital due to a sense of shyness or were seeking a cure in private medical centers. According to the English literature, sexually active women aged <25 years have the highest rates of genital HPV infections [9]. But in a study from Turkey, 84.3% and 15.7% of 83 patients with anogenital warts were reported as male and female, respectively [10]. The US National Health and Nutrition Examination Survey reported the overall prevalence of HPV infection in women aged 14-59 years as 26.8%. The rates of prevalence of HPV infection were reported as 44.8%, 27.4% and 24.5% in women aged 20-24 years, 25-29 years, and 14-19 years, respectively [9]. The prevalence of genital warts in men was most commonly reported between the ages of 25-29 years by Insinga et al. [11]. However, our data were different in terms of gender compared to the English literature. Anogenital warts, which are more common in women in general, were found to be lower in our study (77.8% male and 22.2% female). The mean age of the patients was 34.58 ± 12.64 (3-88) years. Similar to literature data, the most common age range of our female patients was found to be 20-29 years (36.4%). But, the majority of the male group was between the ages of 30-39 years (36.4%), and these data were different from the literature. The fact that 81.8% of patients diagnosed with anogenital warts were between the ages of 20-49 supported that the disease is common in young adults.

Although the seroprevalence of HSV-2 in the US is approximately 20%, it has been reported that herpes genitalis cases due to HSV-1, especially at the adolescent age, have increased in recent years [12,13]. There are also some studies in the literature that herpes genitalis is more common in women than in men [14,15]. In our study, 0.069% of all patients were diagnosed with herpes genitalis and the numbers of male and female patients were equally distributed (50% male and 50% female). The mean age of the patients was 33.3 ± 14.91 (1-68) years. The age group with the highest frequency was the 30-39 age group (27.3%) and the second most frequent was the 20-29 age group (25%). Most patients, 75% of all patients with herpes genitalis, were between the ages of 20-49 years and this data was found to be consistent with the information that the disease is more common in young adults. We believe that herpes genitalis is more common in the population. Similar to patients with anogenital warts, female patients applying to the gynecology outpatient clinic may be a reason for reducing the number of applications to the dermatology outpatient clinic. In addition, recurrent attacks of herpes genitalis can be neglected by the patients because they are mildly symptomatic or asymptomatic.

We could not find much data in the literature on the frequency of genital molluscum contagiosum. In our study, 24 patients (0.037% of all patients) were diagnosed with genital molluscum contagiosum. Although it is slightly more common in women in terms of gender, a statistically significant difference was found. The mean age of the patients was 20.29 ± 12.24 (3-48) years. Although the age group with the highest frequency was the 20-29 age group (45.8%), it was remarkable that the 0-9 age group was the second most frequent (33.3%).

Although there is a periodic increase in the frequency of syphilis, there has been a decrease in general in recent years [16]. We found the frequency of syphilis as 0.026%. Although we could not find a statistically significant difference, we found that it was more common in men (58.8%) than in women (41.2%). According to the data reported from Turkey and abroad in recent years, it has been reported that it is more common in men than in women [17,18]. Our data can also support the increase in the male:female ratio reported in recent years. Although the mean age of the patients was 43.82 ± 14.16 (20-78) years, the age group with the highest frequency was the 30-39 age group (47.1%). More than 80% of the patients diagnosed with syphilis were between the ages of 30-59, so syphilis was more common in adults, consistent with our other diseases. As a result of our observations, most of the patients who were diagnosed with syphilis were identified after an incidental syphilis serology. This situation can be interpreted as the patients did not apply to the hospital in the primary and secondary stages.

The fact that granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle, among other diseases included in our study, could not be detected in any of the patients suggests that these diseases are not common in our country. However, the possibility that these rare diseases can be overlooked by inexperienced physicians and can easily miss the diagnosis, as well as the fact that some of the laboratory tests required to confirm the diagnosis are not available in our hospital may be the reasons for not being able to diagnose these diseases.

Other possible reasons for the low frequency of all diseases are i) the patient registration and follow-up system does not work properly, ii) since our hospital is a university hospital, our department is not seen as the first point of application by patients, iii) as a result of the fact that patients are psychologically affected by their illness and they perceive it as a feeling of guilt, they either never apply to the hospital or they apply to a private hospital/medical center because their personal information is requested to be kept confidential.

Study Limitations

The results were based upon the retrospective evaluation of the patients that applied to the outpatient clinic of Istanbul University Cerrahpasa-Cerrahpasa Faculty of Medicine Dermatology Department. Further studies with longer follow up intervals and larger case series are needed to reach nation-based conclusions.

Conclusion

In this retrospective study, we evaluated the anogenital warts, herpes genitalis, genital molluscum contagiosum, syphilis, granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle patients that applied to our dermatology outpatient clinic; the parameters were the disease frequency, age, age distribution, gender and gender distribution by age.

The frequency of anogenital warts, herpes genitalis, genital molluscum contagiosum and syphilis were 0.46%, 0.069%, 0.037% and 0.026%, respectively. The average ages of these diseases were 34.58 ± 12.64 , 33.3 ± 14.91 , 20.29 ± 12.24 , and 43.82 ± 14.16 , respectively. Although the frequency data were low as we thought, most of the data related to age were found to be compatible with the literature data.

In terms of gender distribution; while men were more affected by anogenital warts and syphilis, women were slightly more affected by genital molluscum contagiosum. However, the gender distribution in herpes genitalis was equal. According to the evaluation of these data, no statistically significant difference was found except for anogenital warts.

No records of patients diagnosed with granuloma inguinale, lymphogranuloma venereum, pediculosis pubis and ulcus molle were found.

Larger case series and multi-center studies, including patients admitted to urology and gynecology outpatient clinics, are needed in order to interpret the data more accurately on demographic characteristics and frequencies of STIs.

Ethics

Ethics Committee Approval: Approval of the Cerrahpasa Medical Faculty Ethics Committee was taken (13.03.2012-B.30.2.I ST.0.30.11.06/109).

Informed Consent: Retrospective study.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: G.Y., Concept: G.Y., S.S., Design: G.Y., S.S., Data Collection or Processing: G.Y., S.S., Analysis or Interpretation: G.Y., S.S., Literature Search: G.Y., Writing: G.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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DOI: 10.4274/jtad.galenos.2021.07279

J Turk Acad Dermatol 2021;15(4):108-112

Comparative Prospective Evaluation of the Effectiveness of Long-pulsed Nd-YAG Laser and Fractional Er-YAG Laser Treatments in Keloid and Hypertrophic Scars

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ABSTRACT

Background: Keloid and hypertrophic scars are pathological scars that occur as a result of the abnormal healing process of the skin against trauma. It bothers patients cosmetically and causes itching, pain, burning, sensitivity and loss of function in patients. There is no single treatment with proven efficacy in the treatment of keloid and hypertrophic scars. Laser treatments, a relatively new modality, are increasingly being used in keloid and hypertrophic scars treatment to reduce the risk of relapse and achieve positive cosmetic and symptomatic results. In our study, we aimed to compare the effectiveness of long-pulsed Nd-YAG laser and fractional Er-YAG laser treatments in the treatment of keloid and hypertrophic scars.

Materials and Methods: Twenty patients with keloid and/or hypertrophic scars were included in the study. Patients with keloid and/or hypertrophic scars were divided into two groups of ten, each for five sessions of laser treatment. Group A received fractional Er: YAG laser, group B received long-pulsed Nd: YAG laser treatment. Patients were evaluated before treatment and their lesions were photographed. The patients were evaluated with the Stony Brook Scar Evaluation Scale and the treatment satisfaction scale three months after the treatment was completed.

Results: There was no change in Stony Brook Scar Evaluation Scale scores before and after treatment in both groups. After the treatment, eight patients were satisfied with the treatment, and twelve patients were not satisfied with the treatment.

Conclusion: Long-pulsed Nd-YAG laser and fractional Er-YAG laser treatments have not been shown to be effective in the treatment of keloid and/or hypertrophic scars.

Keywords: Keloid, Hypertrophic scars, Long-pulsed Nd-YAG laser, Fractional Er-YAG laser

Introduction

Keloid and hypertrophic scar are forms of pathological healing resulting from an abnormal response of the skin to trauma [1]. These wound healing disorders both cosmetically disturb patients and cause itching, pain, burning, sensitivity and loss of function in patients [2]. Quality of life is affected by functional impairment and psychosocial burden in affected individuals [3].

Keloids extend into normal skin beyond the original lesion confine and cannot be stretched. However, hypertrophic scars remain within the confines of the original lesion, but may increase or decrease in size over months or years [4].

The pathogenesis of keloid and hypertrophic scar is not fully known. Changes in the wound healing process and many local and genetic factors are thought to play a role in the pathogenesis [5,6,7].



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Received: 22.06.2021 **Accepted:** 09.08.2021

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The methods used in the treatment of keloid and hypertrophic scars are intralesional or topical corticosteroids, cryotherapy, radiotherapy, silicone gel, compression, topical imiquimod, other intralesional treatments (5-FU, bleomycin, interferon), surgical repairs and laser treatments. Patients' response to these treatments is variable [8]. Because of the painful use of intralesional steroids and cytostatic agents, side effects such as atrophy and telangiectasia, hypopigmentation after cryotherapy, pigmentation disorders and ulceration after radiotherapy, physicians have been pushed to investigate new treatment methods. Recent studies show that laser applications can be an effective and safe method in the treatment of keloids and hypertrophic scars.

Fractional ablative lasers promote wound healing and cause textural remodeling of scars. Nd: YAG laser is preferred in keloid and hypertrophic scar treatment due to its ability to heat both collagen and vascular elements in the dermis [9].

Materials and Methods

Twenty patients who were admitted to outpatient clinic of the Dermatology Department, Istanbul University-Cerrahpaşa Cerrahpaşa Medical Faculty due to keloid and/or hypertrophic scar were included in this prospective study. Patients under the age of 18; immunocompromised, pregnant or breastfeeding; with an acute bacterial or viral infection on the lesion; with a history of skin cancer; and those that are sensitive to light were excluded from this study. In the pre-treatment evaluation, each patient's age, gender, Fitzpatrick skin type, previous treatments, number of lesions, lesion localization, lesion formation pattern and Stony Brook Scar Evaluation Scale scores were noted. Clinical photographs of the lesions of each patient were taken before the treatment.

Patients with keloid and/or hypertrophic scars were divided into two groups of ten each. Group A received fractional Er: YAG laser and group B long-pulsed Nd: YAG laser treatment.

Ten patients in group A received a total of five sessions of fractional Er: YAG laser (Fotona; Dualis SP, Ljubljana, Slovenia) at 4-6 week intervals. The laser parameters were a fluency of 8.4 J, a 3 mm spot size and a frequency of 3 Hz. All lesions of the patient were treated with the specified parameters with two passes.

Ten patients in group B received a total of five sessions of long-pulsed Nd: YAG laser (Fotona; Dualis SP, Ljubljana, Slovenia) at 4-6 week intervals. The laser parameters were a fluency of 180 J, a spot size of 2 mm, and a frequency of 3 Hz. All lesions of the patient were treated with the specified parameters with two passes.

All laser treatments were performed after applying 2% lidocaine topically under occlusion for 30 minutes. No other wound treatments were performed between laser treatment sessions to avoid bias in our results. Patients were evaluated at each session for adverse

effects including pain, erythema, infection, and hyperpigmentation or hypopigmentation.

All lesions of each patient were evaluated using the Stony Brook Scar Evaluation Scale three months after the last laser treatment, and each lesion was photographed. In addition, each patient was evaluated with a 4-point satisfaction scale three months after the last laser session.

The approval of Istanbul University-Cerrahpaşa, Cerrahpaşa Medical Faculty Ethics Committee was taken before initiating the study. The informed consent of each patient was taken.

Results

Of the twenty patients included in the study, six were male and fourteen were female. The mean age of the patients was 29.8 years; with the youngest being 18 years old and the oldest being 54 years old. The Fitzpatrick skin types of the patients ranged from 2 to 3. The most commonly used treatments before laser treatment were intralesional corticosteroid injections and cryotherapy. Twenty patients had 141 lesions in total. The lesions were most frequently located in the shoulders and the second most frequently in the chest. Keloid and/or hypertrophic scar formation developed after trauma in one patient, after surgery in seven patients, after burn in two patients, and after acne vulgaris in four patients.

Fractional Er: YAG laser treatment was applied to all lesions of ten patients in group A. The average age of patients in group A was 24.4 years. Six of the patients in this group were women and four were men, and the total number of lesions was ninety-three. Lesions most frequently developed after acne vulgaris in patients in this group. Stony Brook Scar Evaluation Scale score was found to be 1 for each of the ninety-three lesions before treatment. There was no change in the Stony Brook Scar Evaluation Scale scores of the lesions that were re-evaluated 3 months after five sessions of laser treatment. Most of the patients were not satisfied with the treatment in the satisfaction assessment scale performed three months after the end of the treatment. Three patients stated that their itching complaints decreased after the treatment. All ten patients who received treatment had post-treatment burning and reduced redness within a few days. None of the patients had side effects such as postlesional hyperpigmentation or postlesional hypopigmentation. Figure 1a shows the pre-treatment of fractional Er: YAG laser treatment of a 25-year-old female patient who developed a keloid after acne on the anterior chest; and Figure 1b shows 3 months after the 5th treatment session of the same patient. Nd: YAG laser treatment was applied to all lesions of ten patients in group B. The average age of patients in group B was 35.5 years. Eight of the patients in this group were women and two were men, and the total number of lesions was forty-eight. Lesions most frequently developed after

surgery in patients in this group. Stony Brook Scar Evaluation Scale score was found to be zero in three lesions before treatment and one in other lesions. There was no change in the Stony Brook Scar Evaluation Scale scores of the lesions that were re-evaluated three months after five sessions of laser treatment. Most of the patients were not satisfied with the treatment in the satisfaction assessment scale performed three months after the end of the treatment. Four patients stated that their itching complaints decreased after the treatment. Pain complaints during treatment were more common in patients compared to the other group. All ten patients who received treatment had post-treatment burning and reduced redness within a few days. None of the patients had side effects such as postlesional hyperpigmentation or postlesional hypopigmentation. Figure 2a shows the pre-long-pulsed Nd: YAG laser treatment of a 54-year-old male patient with a keloid developed at the suture line after surgery under the left breast; and Figure 2b shows 3 months after the 5th treatment session of the same patient.

The results revealed that neither of the laser treatments had any effect on hypertrophic scar and/or keloid treatment.

Discussion

This study investigated and compared the effectiveness of fractional Er: YAG laser and long-pulsed Nd: YAG lasers for treating keloid and hypertrophic scars.

In the study published by Koike et al. [10] in 2014, the effectiveness of long-pulsed Nd: YAG laser was evaluated in 102 patients. The patients were treated for a year with the treatment applied every 3-4 weeks. The scars were evaluated using the Japan Scar Workshop Scar Scale 2011 before starting treatment and one month after the last session. As a result of the study, it was observed that there was a significant decrease in the Japan Scar Workshop score in keloid and hypertrophic scars.

In the study published by Al-Mohamady et al. [11] in 2016, the effectiveness of pulsed dye laser and long-pulsed Nd: YAG laser

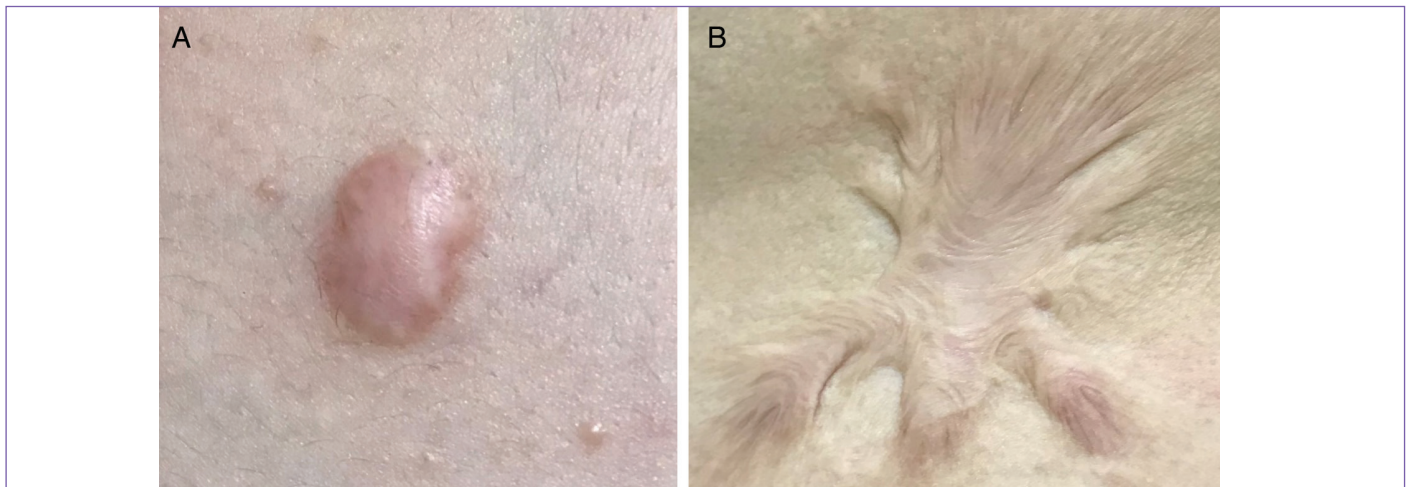


Figure 1. A) Pre-treatment of two patients treated with fractional Er: YAG laser. B) Three months after the 5th treatment session of two patients treated with fractional Er: YAG laser

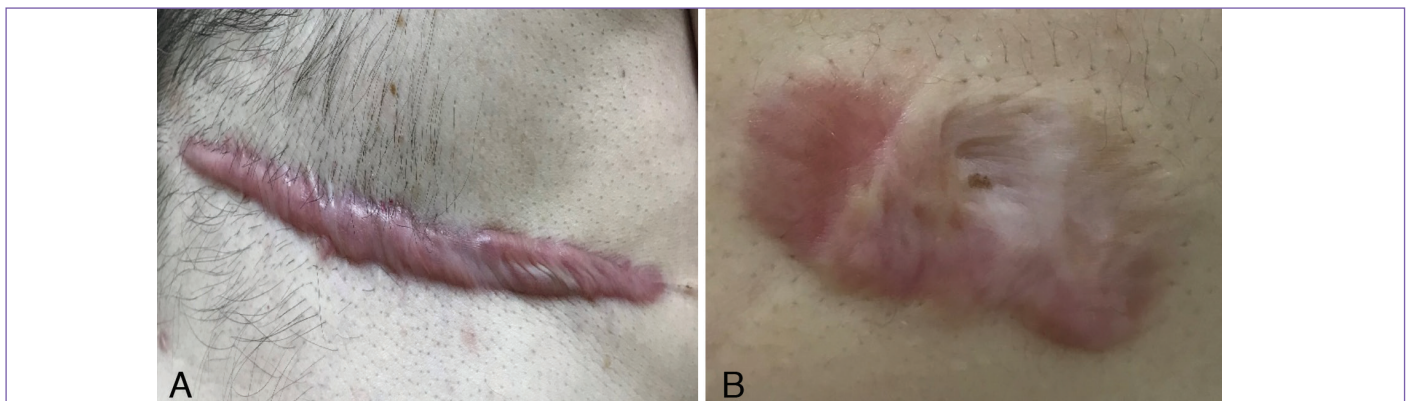


Figure 2. A) Pre-treatment of two patients treated with long-pulsed Nd: YAG laser. B) Three months after the 5th treatment session of two patients treated with long-pulsed Nd: YAG laser

was compared in a study involving twenty patients with keloid and hypertrophic scar. Pulsed dye laser was applied to half of the lesions and long-pulsed Nd: YAG laser treatment was applied to the other half six times with one month intervals. Lesions were assessed using the Vancouver scar scale at baseline and one month after the last laser session. While significant improvements were achieved in Vancouver scar scale after treatment with both lasers, no statistically significant difference was found between the pulsed dye laser and long-pulsed Nd: YAG laser treated areas.

The effectiveness of fractional CO₂ laser and long-pulsed Nd: YAG laser in 30 patients with keloid and hypertrophic scar, published in 2020 by Tawfic et al. [9]. Three scars were selected in each patient, and fractional CO₂ laser, long-pulsed Nd: YAG laser and a combination of both were applied to the lesions 4 times at 4-6 week intervals. Patients were evaluated before starting treatment and 1 month after the last session using the Vancouver Scar Scale and the Patient and Observer Scar Assessment Scale. At the end of the study, long-pulsed Nd: YAG laser was found to be effective and safe in the treatment of hypertrophic scars and keloids, while fractional CO₂ laser provided better healing in hypertrophic scars compared to keloids. In lesions where both lasers were applied in combination, no significant additional benefit was seen and the side effect profile was higher.

In the study published by Choi et al. [12] in 2014, the efficiency of fractional CO₂ laser and fractional Er: YAG laser was compared in 23 patients with hypertrophic scar. In the study in which 10 patients were treated with fractional CO₂ laser and 13 patients with fractional Er: YAG laser, treatment responses were evaluated using the Vancouver Scar Scale, the evaluation of healing based on photographs and the scale showing the satisfaction of the patients. As a result of the study, fractional CO₂ laser was found to be more effective than fractional Er: YAG laser treatment in hypertrophic scar treatment.

In the literature, the mechanism of action of laser treatment in scar treatment is explained as heat generation that initiates inflammation and causes an increase in vascular permeability, matrix metalloproteinase production and collagen fiber fascicle decomposition. This shows that lasers will be one of the alternative treatment methods in the treatment of keloid and hypertrophic scars, which have many treatment options, but with these options, which have high recurrence and side effects. In the literature, there are studies in which long-pulsed Nd: YAG laser and fractional Er: YAG laser are used and found effective in the treatment of keloid and hypertrophic scar. However, there is no study comparing long-pulsed Nd: YAG laser and fractional Er: YAG laser in the treatment of keloid and hypertrophic scar in the literature. Also, contrary to what is stated in the literature, the benefit of long-pulsed Nd: YAG laser

and fractional Er: YAG laser treatment in keloid and hypertrophic scar treatment was not observed in our study.

Study Limitations

The limitation of our study is that the number of patients is low due to the intervening COVID-19 pandemic.

Conclusion

Finally, this is the first study comparing the efficacy of long-pulsed Nd: YAG laser and fractional Er: YAG laser in the treatment of keloid and hypertrophic scars. Again, contrary to what is stated in the literature, successful results have not been obtained in keloid and hypertrophic scar treatment with long-pulsed Nd: YAG laser and fractional Er: YAG laser. Studies with greater sample sizes are needed to further clarify these matters.

Ethics

Ethics Committee Approval: The study were approved by the Istanbul University-Cerrahpasa, Cerrahpasa Faculty of Medicine of Local Ethics Committee (protocol number: F-01, date: 02.04.2019).

Informed Consent: The informed consent of each patient was taken.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: A.M.G., Ö.A., Concept: A.M.G., Ö.A., Z.K., Design: A.M.G., Ö.A., Z.K., Data Collection or Processing: A.M.G., Ö.A., Analysis or Interpretation: A.M.G., Ö.A., Literature Search: A.M.G., Writing: A.M.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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DOI: 10.4274/jtad.galenos.2021.52724

J Turk Acad Dermatol 2021;15(4):113-115

Multiple Cutaneous Nodules in Segmental Distribution- Zosteriform Leiomyoma Revisited

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ABSTRACT

Cutaneous leiomyoma are benign smooth muscle tumors of the skin. They present as solitary or multiple flesh colored, occasionally painful skin-colored to brownish papules and nodules. The uncommon pattern of multiple leiomyoma includes linear, zosteriform, or dermatomal like arrangement of lesion. Segmental or zosteriform leiomyoma can occur either along single dermatome (type 1) or with scattered non segmental lesions elsewhere (type 2). Type 2 segmental leiomyomas have been rarely reported in literature and after extensive search in PubMed-Medline database we could find less than ten cases of this variety reported till date from eastern part of India. Here we are reporting a case of type 2 zosteriform leiomyoma for its rarity and its potential association with renal cell carcinoma which required regular follow up.

Keywords: Zosteriform, Leiomyoma, Segmental

Introduction

Cutaneous leiomyomas are benign smooth muscle tumors of the skin which is characterized by painful nodule, that can present either singly or multiply [1]. When multiple they can be arranged in diffuse (disseminated), or segmental (blaschkoid or zosteriform) patterns. Segmental or zosteriform leiomyomas usually occur along single dermatome unilaterally (type 1); or rarely they may be associated with scattered, isolated lesions elsewhere (type 2) [2].

Here we present a case of type 2 zosteriform leiomyoma; as this variety is very rare in occurrence.

Case Report

A 45 year old male patient presented to us with multiple firm painful swelling, mainly on left side of his lower back for the last 20 years. The lesions progressively increased in size over time. He also gives history of pain which was aggravated on exposure

to cold. There was no history of any urinary disturbance. Family history was negative. On cutaneous examination skin colored to brown, firm, tender papules and nodules of size 0.5-1 cm present along the posterior aspect of lower back on the left side in segmental or zosteriform pattern. Few scattered lesions were present on upper back, upper and mid portion of his chest and left shoulder (Figure 1). Hair, nail, other mucosae were normal. Systemic examination shows no abnormality. Routine blood examinations were normal. Ultrasonography of lower abdomen was normal and histopathological examination with haematoxylin and eosin stain revealed poorly demarcated interlacing bundles of smooth muscle fibres intermingled with varying amount of collagen (Figure 2, 3, 4). Special stain with Masson's trichome stained the smooth muscle red (Figure 5).

Based on clinical and histopathological findings we diagnosed this case as type 2 zosteriform leiomyoma. Genetic study couldn't be done due to unavailability and financial constraints.



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Received: 13.12.2020 **Accepted:** 20.03.2021

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The patient was counseled about his disease and the therapeutic options were discussed. He refused to undergo any active intervention for his condition. He was given nifedipine (10 mg three times a day) and was kept under regular follow up.

Discussion

Cutaneous leiomyomas comprises approximately 5% of all leiomyomas [3]. According to the site of origin, they are of three types; piloleiomyoma (most common variant derived from arrector pili muscle of hair follicles), angioleiomyoma (derived from vascular smooth muscle) and dartoic leiomyoma (arising from genital

smooth muscle) [4]. Cutaneous leiomyomas are more common in adults than in children [3].

Multiple cutaneous leiomyoma is the most common clinical variety, with lesion mainly situated over the trunk and extremities. However rarely they may occur on the tongue or any other part of mouth [4]. The lesions present as small, red brown, firm papule, ranges from few millimeter to 1 cm, and usually fixed to skin but movable over underlying deeper structures [4]. Multiple piloleiomyomas may be inherited in an autosomal-dominant fashion and may be associated



Figure 1. a, b) Multiple cutaneous nodules in zosteriform distribution



Figure 2. Histopathological examination with haematoxylin and eosin stain under 4x

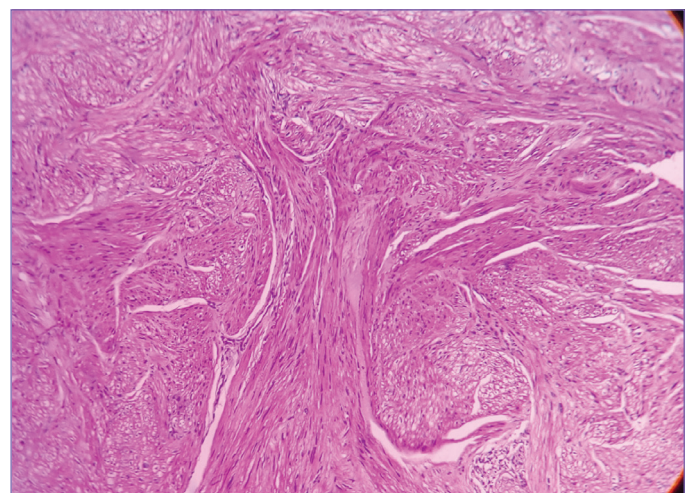


Figure 3. Histopathological examination with haematoxylin and eosin stain under 10x

with uterine leiomyomas and aggressive renal carcinoma, also known as multiple cutaneous and uterine leiomyomatosis or Reed's syndrome and hereditary leiomyomatosis and renal cell carcinoma, respectively [1]. Patients with piloleiomyoma often have pain that may be spontaneous or secondary to cold, pressure, or emotion. The exact mechanism is unknown but the possible explanation could be due to pressure on nerve fibres and abnormal muscle contraction [3]. Our patient also complains of pain on exposure to cold.

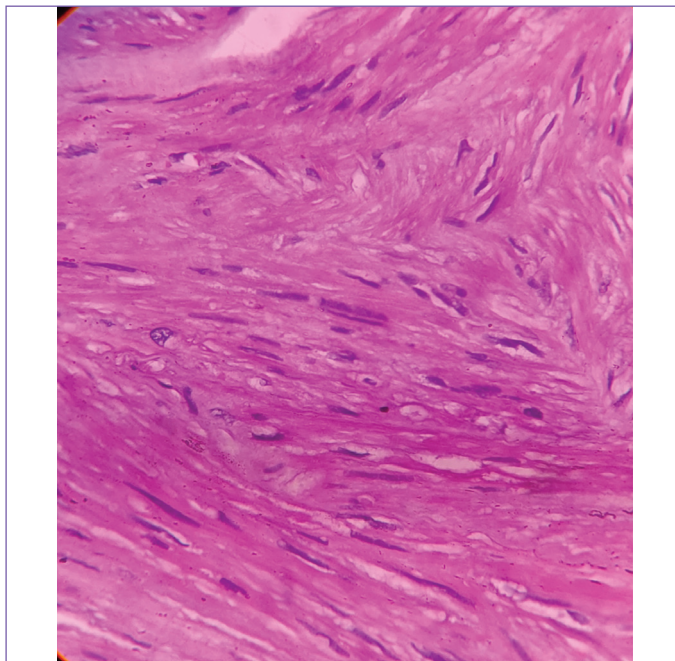


Figure 4. Histopathological examination with haematoxylin and eosin stain under 40x

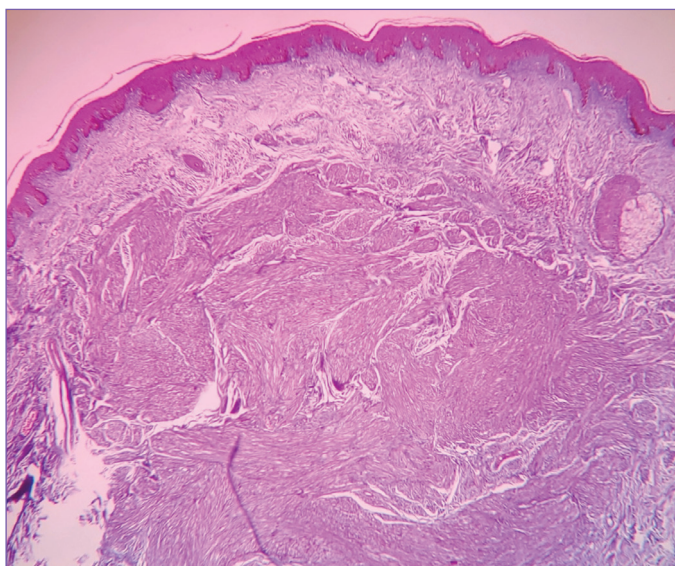


Figure 5. Special stain with Masson's trichrome

Histology of piloleiomyoma is characterized by bundles of smooth muscle arranged in interlacing or whorled pattern with abundant eosinophilic cytoplasm and thin, elongated blunt edged nuclei [5].

Treatment of cutaneous leiomyoma depends on the number of lesions and the presence or absence of symptoms. Different modalities of treatment include medical management with nifedipine, doxazosin, gabapentine, phenoxybenzamine and other alpha-1 blockers; surgical excision if number of lesions few; cryotherapy with liquid nitrogen, CO₂ laser ablation with varying success. The condition may however recur [2,5].

Type 2 segmental leiomyomas have been rarely reported in literature and after extensive search in PubMed-Medline database we could find less than ten cases of this variety reported till date from eastern part of India.

Bandyopadhyay et al. [5] reported a case of 32-year-old man who presented with leiomyoma distributed segmentally over C6 to T8 dermatomes on left side and T11 to L1 dermatomes on right side.

Kudligi et al. [4] reported a case of unilateral multi-segmental leiomyomas along 5th cervical, 6th dorsal, and 1st sacral segments of right side in a 30 year old female.

In conclusion, we are reporting a case of type 2 zosteriform leiomyoma for its rarity and its potential association with RCC which required regular follow up.

Ethics

Informed Consent: Consent form was filled out by a participant.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: S.S., Design: O.R., Data Collection or Processing: S.S., S.D., Analysis or Interpretation: S.Se., Literature Search: S.S., A.H., Writing: S.S., S.D.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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DOI: 10.4274/jtad.galenos.2021.96158

J Turk Acad Dermatol 2021;15(4):116-118

Skin Rashes After Using Hydroxychloroquine in a COVID-19 Patient

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ABSTRACT

Hydroxychloroquine is an antimalarial drug which is also used in various chronic diseases such as systemic lupus erythematosus and rheumatoid arthritis because of its anti-inflammatory and antiviral effects. Recently, it's frequently preferred as a treatment alternative in the Coronavirus disease-2019 (COVID-19) pandemic. Skin side effects of hydroxychloroquine range from side effects such as pruritus, urticaria, alopecia, dry skin, pigment changes, redness to serious Stevens-Johnson-like life-threatening rashes. Herein, we report a patient who was infected with COVID-19 and started hydroxychloroquine and had a rash on her hands after a short time. Contact dermatitis is one of the first diagnoses to be considered in the differential diagnosis, since lesions are only seen on the hand. Our patient did not respond despite the use of topical corticosteroids, which are used as the first step in the treatment of contact dermatitis. Another disease that should be considered in the differential diagnosis of our patient is phototoxic and photoallergic contact dermatitis, which is well-known to be caused by hydroxychloroquine. Although it is clinically difficult to distinguish contact dermatitis from photo-induced dermatitis, the fact that our patient was exposed to intense sunlight during drug use is a clue to the diagnosis of photo-induced skin reaction.

Keywords: Hydroxychloroquine, Dermatitis, Photo-induced, Drug eruption, COVID-19

Introduction

Hydroxychloroquine is a drug developed to prevent and treat malaria; it is also used in various chronic diseases such as systemic lupus erythematosus and rheumatoid arthritis due to its anti-inflammatory and antiviral effects. Since hydroxychloroquine has previously been shown to be effective in HIV and SARS infections, it has been considered as a treatment alternative for researchers in the Coronavirus disease-2019 (COVID-19) pandemic [1].

Although hydroxychloroquine most commonly causes gastrointestinal and dermatological side effects, these side effects are mostly mild and usually do not require discontinuation of the drug. Neuropathy, retinopathy, cardiotoxicity and myopathy in the proximal muscles are known serious adverse events and are rarely seen [1]. Skin side effects of antimalarial drugs range from side effects such as pruritus, urticaria, alopecia, dry skin, pigment

changes, redness to serious Stevens-Johnson-like life-threatening rashes [2]. We wanted to present you with a patient who was infected with COVID-19 and started hydroxychloroquine and had a rash on her hands after a short time.

Case Report

A 30-year-old woman who works as a secretary in the Dermatology Department of Gazi University Hospital applied to the outpatient clinic for routine COVID-19 screening on 30th April. She had no symptoms such as cough, sore throat, headache, fatigue, which could be related to SARS-CoV-2. Coronavirus conventional polymerase chain reaction test taken from the throat swab was positive. She started to receive hydroxychloroquine at a dose of 400 mg and ascorbic acid 1000 mg daily. The patient had continued the treatment for 10 days, and 3 days after the treatment was



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Received: 02.03.2021 **Accepted:** 05.04.2021

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stopped, the patient complained of redness, dryness, and peeling on her hands. The rashes were more pronounced, especially on the fingertips and interphalangeal joints, and the exfoliation and dryness gradually spread to the palms. There was tenderness on palpation in the rashes and the patient complained of itching (Figures 1, 2).

She reported that she had no personal or family history of drug eruptions and had never experienced such a rash before. On dermatological examination, erythematous desquamative plaques were present on fingertips and over interphalangeal joints and

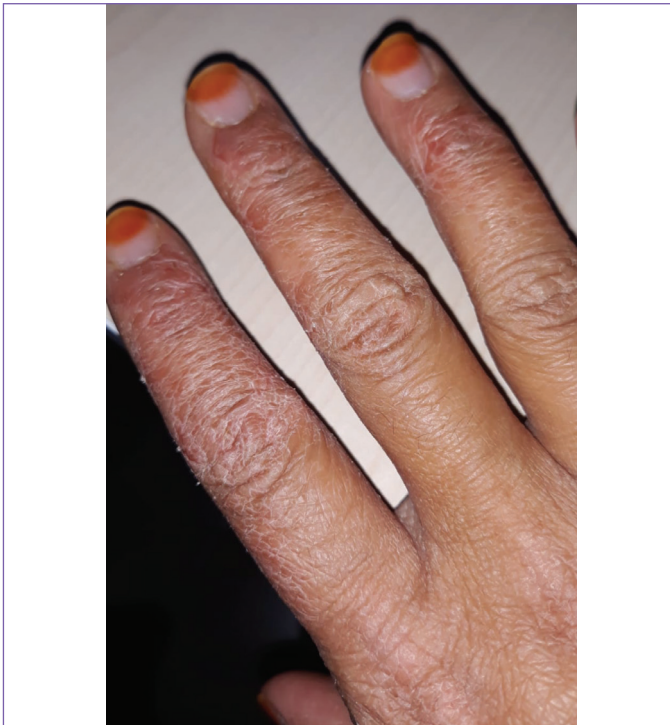


Figure 1. Erythematous desquamative plaques on interphalangeal joints, lichenification and exaggerated skin lines



Figure 2. Desquamation on palmar surface of hands

there was desquamation on the bilateral palmar surfaces. When the patient's history was detailed, it was learned that the patient spent time in her garden and was exposed to intense sunlight. Betamethasone valerate + fusidic acid combination was initiated to the patient, and the patient's medication was changed to methylprednisolone aceponate, as the lesions did not regress in the control examination on the 3rd day. In the control examination of the patient one week later, there was still no improvement in the lesions.

Discussion

In the COVID-19 pandemic, the frequency of eczematous rashes on the hand has increased and the most common reason is the frequent use of disinfectants. In the present case, contact dermatitis is one of the first diagnoses to be considered in the differential diagnosis, since lesions are only seen on the hand. While irritant contact dermatitis is the most common contact dermatitis, it is followed by atopic dermatitis, allergic contact dermatitis, and eczematous dermatitis [3].

Although itching, tenderness, and hyperkeratosis observed in our case are also seen in irritant contact dermatitis, our patient did not respond despite the use of topical corticosteroids, which are used as the first step in the treatment of contact dermatitis. Another disease that should be considered in the differential diagnosis of our patient is phototoxic and photoallergic contact dermatitis, which is well-known to be caused by hydroxychloroquine. In the literature, a patient with long-term hydroxychloroquine use had itchy, eczematous dermatitis on the face and hands triggered in the summer, and the photo-test result with narrow-band ultraviolet B was positive [4]. Although it is clinically difficult to distinguish contact dermatitis from photo-induced dermatitis, the fact that our patient was exposed to intense sunlight during drug use is a clue to the diagnosis of photo-induced skin reaction.

As a result, light exposure should be questioned in skin rashes that occur during the use of photo-sensitizer drugs such as hydroxychloroquine, and photo-induced skin reactions should be considered in the differential diagnosis.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: E.A., Concept: E.A., Design: A.S., Data Collection or Processing: E.A., P.Ü., Analysis or Interpretation: P.Ü., A.S., Literature Search: P.Ü., A.S., Writing: P.Ü.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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DOI: 10.4274/jtad.galenos.2021.43153

J Turk Acad Dermatol 2021;15(4):119-120

Proceed to the Diagnosis of an Annular Lesion

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Keywords: Annular lesion, Lichen planus, Hypertrophic lichen planus

Dear Editor,

Lichen planus (LP), the prototype of lichen dermatoses is an idiopathic inflammatory disease of the skin and mucous membrane. Classic LP presents with characteristic 5Ps- polygonal, pruritic, plane (flat-topped), purple (violaceous) papules and plaques that favours the extremities [1,2]. Prevalence of LP is 1% in general population. Nearly two-thirds of cases of LP presents between the ages of 50 and 60 years with peak onset between 55 and 74 years [3,4].

LP has a lot of variants including oral, nail, linear, annular, atrophic, hypertrophic, inverse, eruptive, bullous, ulcerative, LP pigmentosus, lichen planopilaris, vulvovaginal, actinic, LP pemphigoides and LP-lupus erythematosus overlap [5].

Annular LP occurs when papules spread peripherally and central area resolves. The annular edge is slightly raised and central area is hyperpigmented or skin coloured. Annular lesion occurs in 10% patients with LP and are usually scattered among classical typical lesions [6].

A 32 year old female presented to our dermatology OPD with extremely itchy, hyperpigmented keratotic plaques on trunk and extremities (Figure 1). The lesions were present for last 8 months. She had taken ayurvedic medicines for the same with no relief. The lesions initially started as small, itchy papules on wrists, arms, ankles and legs; and gradually increased in size with centrifugal expansion and similar lesions also appeared on trunk. Some of the lesions cleared in the centre to assume annular configuration.

On examination, there were hyperpigmented, keratotic plaques with well-defined border on the extensor aspects of wrists, forearm,

legs, and trunk with some lesions on dorsal foot and wrists having annular configuration with normal skin in the centre. The lesions were of 1-3 cm in size. On application of mineral oil and using a magnifying lens, Wickham striae was demonstrated. There were no lesions on oral and genital mucosa. Nails and hair were normal.

We considered differentials of annular and hypertrophic LP, prurigo nodularis and lupus vulgaris.



Figure 1. Keratotic plaques on trunk and extremities



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Received: 28.12.2020 **Accepted:** 18.01.2021

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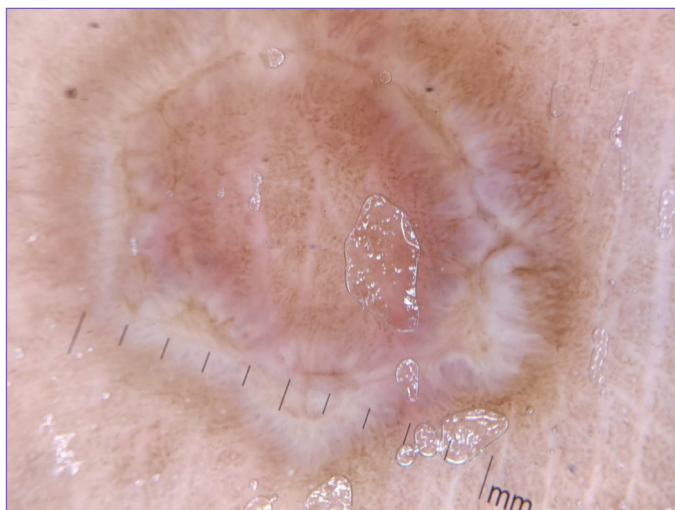


Figure 2. Dermoscopic picture

Dermoscopy of the lesions revealed white, broad reticular striae on purplish to brownish background. Fine red dots around the striae were also noted (Figure 2).

Laboratory investigations showed normal blood counts, fasting hyperglycemia with elevated serum cholesterol level. Serological tests for human immunodeficiency virus-1 and 2, Hep B and Hep C were negative. Mantoux test showed no erythema and induration. Chest X-ray was within normal limits.

Biopsy was taken from one such annular and histopathological examination using haematoxylin and eosin stain was done. It revealed lymphocytic infiltrate in a diffuse band like pattern in the upper dermis along with basal cell vacuolation with subepidermal clefts (Figure 3).

She was treated with oral prednisolone 30 mg daily, proton pump inhibitors, anti-histaminics and topical Emollient lotion for 4 weeks following which smaller lesions resolved and large lesions reduced in size and thickness.

Based on the above findings, a diagnosis of hypertrophic LP and Annular LP was reached.

Pure annular LP is rare. In most cases of LP, 10% of lesions are annular. Another rare variant is annular atrophic LP. Annular lesions are usually associated with oral and genital lesions which were absent in our case.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Internally peer-reviewed.



Figure 3. Histopathological picture: lymphocytic infiltrate in a diffuse band like pattern in the upper dermis along with basal cell vacuolation with subepidermal clefts

Authorship Contributions

Surgical and Medical Practices: S.D., O.R., P.N., A.P., S.Man., Concept: S.D., A.M., P.P., S.M., S.B., S.Man., Design: S.D., P.P., P.N., S.M., Data Collection or Processing: S.D., P.N., P.D., Analysis or Interpretation: S.M., A.P., Literature Search: S.D., P.P., O.R., A.P., P.D., Writing: S.D., P.P., O.R., P.N., A.P., P.D., S.Man.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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