

Epidemiological Studies On Dermatophytosis In Human In Hail Region Of Saudi Arabia

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Abstract : Dermatophytes are group of common fungal agent that cause superficial skin infection worldwide. Three main genera *Trichophyton*, *Epidermophyton* and *Microsporum* are commonly spread in tropical and subtropical regions in which the incidence of the pathogen is the highest. The present work emphasizes importance of epidemiological data regarding to the prevalence of different dermatophyte species infecting human in (Hail region, KSA), and the different clinical factors as age, sex and nationality of patients. A total of 6844 patients suffering from different skin infections were visited the Outpatient Departments of Derma clinic of Hail general hospital(OPD) in the period of two years and two months from Jan 2013 to Feb 2015. Only 755 cases (11,3%) are suspected as dermatophytes, but the other 6089 cases (88.7%) were suffered from other skin diseases as cutaneous leishmaniasis, Acne, Chicken pox, psoriasis and impetigo. Collection of dermatophytes samples as hair shaft, hair follicles, nail and skin scraping were processed by direct examination using (potassium hydroxide) KOH preparation with heat as 10% for skin scraping and 20% for hair and nails samples, also cultivated on Sabouraud Dextrose agar (SDA) with cycloheximide. Dermatophytes species were identified based on macromorphology and microscopically examinations. Results showed that *Trichophyton* spp., are the predominant one in which 620 cases (82.11%) were positive, followed by *Epidermophyton* spp., 125 cases (16.55%) but *Microsporum* spp., were the lowest in which only 10 cases (1.34%) were positive. Among *Trichophyton* spp., *T.mentegrophyt* was common 425 cases (68.55%) are positive, but 195 cases (31.45%) were positive to *T.rubrum*. Regarding to the age, the most affected age were 15-45 years by 453 cases (60%), followed by 5-15 years were 246 cases (32.58%), Above 45-60 years were 56 cases (7.42%). Male and female ratio of the positive cases recorded as 11% to 27%. In case of Saudi and non-Saudi ratio in positive cases recorded as 72% to 28% percentage. In conclusion, dermatophytosis is one of the important skin infections in Hail Region, KSA and the predominant genera is *Trichophyton* spp., the most susceptible category to infection is (15-45) years old and females mostly affected more than males with the percentage of infection among Saudi is higher than non Saudi.

Keywords: Dermatophytosis, Epidemiology, Hail, Saudi Arabia

I. Introduction

Skin is the largest organ in the human body. So many agents can cause skin infections. Skin diseases were recorded such as cutaneous leishmaniasis, chicken pox, Acne, psoriasis, impetigo, and dermatophytes in the past two years. Dermatophytosis is a disease condition affecting the dermis, epidermis and appendages of the skin as hair, nails, hair follicles, sweat gland and sebaceous gland. *Trichophyton*, *Epidermophyton* and *Microsporum* are the three genera of dermatophytes causes superficial mycosis [1]. Dermatophytes became one of the most significance skin disease especially with excessive use of immunosuppressive drugs in the serious and non-infectious conditions, these drugs produce keratinase which lysis the keratin which help dermatophytes to invade the superficial skin tissue. Dermatophytes infection affect generally cutaneous layer and nonliving cornified layer [2]. Dermatophytes are group of closely related fungi which mainly reproduce asexually but also have a perfect species, classified in the family Arthrodermataceae of the order Onygenales in the division Ascomycota, which can reproduce sexually [3]. Dermatophytes are one of the most important skin infection can cause superficial mycosis which affecting 25% of the population of the world [4]. Hot and humid climate in tropical and subtropical countries help dermatophytes to become common fungal skin infection [5]. Dermatophytes usually transmitted by direct and indirect contact with lesions, contaminated floors, locker rooms, shower stalls benches, barber clipper, combs, hair brushes and clothing. Spores enter through breaks in the skin and moist areas, germinate into filamentous growths, contact with soil of infected animals also leads to infection [6].

II. Materials AND METHODS

The present study conducted in the OPD in the Derma Clinic in Hail general hospital on both sexes and all ages between Jan 2013 till the end of Feb 2015.

2.1 Patients And Strains:

A total of 755 samples in the form of skin scraping hair and nails were collected randomly from the lesions appeared on the patients, for collection of these samples the lesions were wiped by 70% ethanol in order to remove the dirt attached to the lesions . Skin and nail scraping , hair follicles were collected from advancing margins and put in sterile plastic Petri dish . The information were collected from the patients about any treatment taken within the past 2-3 months ,and also about immunosuppressive treatment. Immunocompromised including co-infection with HIV and also other conditions as diabetes . Sex , age and nationality of the patients were noted down .

2.2 Samples Examination:

2.2.1 Direct KOH Mount:

Hair follicles , scraping of skin and nails were treated with 10-20% KOH for 10 minutes , putted on glass slide with heat and examined microscopically for the presence of fungal elements [7].

2.2.2 Isolation Of Dermatophytes Species :

The positive samples which examined microscopically were cultured on Sabouraud Dextrose Agar (SDA) containing cycloheximide (0.05%) and (0.004%) chloramphenicol under sterile conditions . The plates were incubated at 30 °c for four weeks and monitored for the growth .Dermatophyte isolates were picked up with L-shaped needle loop and streaked on SDA slants . The growth on the slants were examined for morphology, texture and pigmentation [8]

2.2.3 Identification Of Dermatophytes Isolates :

Colonies of each isolate were stained with Loctophenol Cotton Blue (LCB) and examined microscopically . The identification was based on features such as organization of hyphea and shape (Pencil shope , spiral , pyriform ,sepetationetc) macroconidia and microconidia (tear-drop , drop like ,cigar shape, spherical , in bunches , a bundonce or rareetc .

2.2.4 Urease Test:

The test is used as an adjunct to the microscopic examination for differentiation of dermatophytes species , most of them have the ability to produce urease enzyme which hydrolyses urea [9]

III. Results

Between Jan 2013 to Feb 2015 ,6844 cases of different skin diseases were collected from OPD patient in Derma clinic of Hail general hospital, only 755 cases (11.3%) were suspected as dermatophytes but the other 6089 cases (88.7%) were suffered from other skin diseases as cutaneous lishmaniasis Acne , chicken pox , psoriasis and impetigo (**Table .1**) The positive dermatophyte species were described as *Trichophyton* species which was the predominant one , 620 cases (82.11%) were positive , *Epidermophyton* species were recorded by 125 positive cases (16.55%) , but *Microsporium* species were recorded only by 10 positive cases (1.34%) predominant one was *M.gypseum* (**Table.2**).

Among *Trichophyton* species, *T.mentegrophyt* was the highest one with 425 positive cases (68.55%) were recorded, but *T.rubrum* were recorded in 195 positive cases (31.45%)(**Table.2**). The main affected age was recorded between 15-45 years in which 453 cases (60%) were found in this range ,but 246 cases (32.58%) were found in the range of 5-15 years .The age above 45-60 years was represent by 56 cases (7.42%) . There is no recorded cases at the age under 5 years and also above 60 years (**Table.3**) .

The males to females ratio were 11:27 positive cases (1.24%) ,but according to the nationality the Saudi male and female positive cases to non-Saudi male and female positive cases was 72%to28% (**Table.3**) .

Table 1. Showing the total number of OPD cases from Derma clinic , Hail general hospital , number of suspected dermatophyte cases and number of other skin diseases.

Monthly / year	Total OPD cases	Number of suspected Dermatophytes	Number of other skin diseases
January 2013	254	30	224
February	195	22	173
March	251	29	222
April	288	32	256
May	302	46	256
June	293	35	258
July	266	27	239
August	199	21	174
September	154	19	135
October	424	49	375

November	175	18	157
December	175	20	155
January 2014	299	33	266
February	326	30	290
March	272	21	251
April	279	27	252
May	300	39	261
June	273	28	245
July	164	18	146
August	189	20	169
September	294	32	262
October	245	26	219
November	366	35	331
December	338	35	303
January 2015	287	31	256
February	236	26	210
Total	6844	755	6089

Table 2. Showing total number of dermatophyte spp., isolates , types and number of isolated species during years 2013,2014 and 2015.

Month /year	Total number of dermatophyte spp., isolates	Types and number of isolated spp.,			Types of <i>Trichophyton</i> spp., and number	
		<i>Trichophyton</i> Spp.,	<i>Epidermophyton</i> Spp.,	<i>Microsporium</i> Spp., (<i>M. gypseum</i>)	<i>T. mentagrophytes</i>	<i>T. rubrum</i>
January 2013	30	24	5	1	16	8
February	22	18	4	□	13	5
March	29	24	5	□	18	6
April	32	28	3	1	19	9
May	46	37	8	1	25	12
June	35	28	7	□	18	10
July	27	21	6	□	15	6
August	21	19	1	1	13	6
September	19	16	3	□	12	4
October	49	40	8	1	24	16
November	18	15	3	□	9	6
December	20	17	3	□	13	4
January 2014	33	27	6	□	18	9
February	36	31	5	□	20	11
March	21	17	4	□	13	4
April	27	22	5	□	15	7
May	39	31	7	1	23	8
June	28	24	4	□	17	7
July	18	14	3	1	8	6
August	20	15	5	□	7	8
September	32	27	5	□	22	5
October	26	20	5	1	14	6
November	35	27	7	1	19	8
December	35	32	3	□	21	11
January 2015	31	26	5	□	18	8
February	26	20	5	1	15	5
Total	755	620	125	10	425	195

Table 3. Showing number of suspected dermatophytes cases ,nationality ,age and sex disruption, years 2013 ,2014 and 2015

Month/Year	No.of Dermatophytosis suspected cases	Nationality				Age				
		Saudi		Non Saudi		0-5	5-15	15-45	45-60	>60
		Male	Female	Male	Female					
January 2013	30	6	18	2	4	-	9	18	3	-
February	22	4	12	3	3	-	3	14	5	-
March	29	5	17	3	4	-	10	15	4	-
April	32	4	19	4	5	-	11	17	4	-
May	46	8	25	6	7	-	16	25	5	-
June	35	7	20	2	6	-	12	21	2	-
July	27	6	16	2	3	-	8	16	3	-
August	21	2	12	5	2	-	3	16	2	-
September	19	3	8	3	5	-	6	11	2	-
October	49	8	27	5	9	-	16	29	4	-

November	18	3	9	1	5	-	7	11	□	-
December	20	3	10	3	4	-	8	12	□	-
January 2014	33	6	14	5	8	-	11	20	2	-
February	36	5	16	6	9	-	14	22	□	-
March	21	4	11	2	4	-	3	16	2	-
April	27	5	12	4	6	-	10	17	□	-
May	39	7	22	5	5	-	12	25	2	-
June	28	4	17	2	5	-	9	18	1	-
July	18	4	8	2	4	-	8	10	□	-
August	20	5	9	4	2	-	6	12	2	-
September	32	5	18	3	6	-	12	18	2	-
October	26	6	15	2	3	-	10	15	1	-
November	35	8	19	3	5	-	12	20	3	-
December	35	3	22	2	8	-	11	21	3	-
January 2015	31	5	18	3	5	-	11	18	2	-
February	26	5	16	2	3	-	8	16	2	-
Total	755	131	410	84	130	-	946	453	56	-

IV. Discussion

Dermatophytosis is a fungal infection of skin ,hair and nails mainly caused by dermatophytes ,it's not life threatening but it can have negative impact on patient's because of conscious about health and looks.

The present work is highlighting the incidence of dermatophytes in Hail region , in this work 6844 cases were collected from different skin diseases from the OPD from Hail general hospital - Derma clinic from the period of Jan .,2013 till Feb .,2015 . Only 755 cases (11.3%) were positive to dermatophytes , but the other 6089 cases (88.7%) were diagnosed as other skin disease as cutaneous leishmaniasis ,Acne ,chicken pox ,psoriasis and impetigo. Hani Saleh Faidah [10] reported similar percentage (12.6%) as 103 cases were examined he found that only 13 positive cases to dermatophytes in Makkah region .

Other studies as in Brazil and India reported a very high percentage (20.7%) and (35.6%) of dermatophytes positive infection ,the variations may be attributed to :The number of examined cases ,the clinical forms of dermatophytes , the laboratory conditions and the geographical distribution of cases which varied according to the climate [11,12,13]. Results showed , *Trichophyton* species were the predominant dermatophyte infection in Hail region, in which 620 positive cases (82.11%)were found ,followed by *Epidermophyton* species in which 125 positive cases (16.55%) ,and lastly 10 positive cases of *Microsporium* species(*M.gypseum*) (1.34%) were found, variable results were recorded by Simpanva M.F .,[3],and Vikesh Bhatia and Prakash Sharma ,[1] they reported different percentage of *Trichophyton* spp., which reach to (98.65%) positive cases , they also found that the percentage of *Microsporium gypseum* reach to (1.35%) positive cases but no report of *Epidermophyton* species infection, these different reported percentage may be due to the different in the climatic conditions between Hail region and India also the different epidemiology of dermatophytes species . The present study showed *Trichophyton* spp. , specially *T . mentagrophyte* founded to be the most common infectious species in Hail because 425 positive cases (68.55%) out of 620 cases which were positive . *Trichophyton rubrum* took the second place because 195 were positive cases (31.45%). Which agreed with Costa M et al.,[14], Blakaumar et al .,[15], Patel et al [16] , Pandey and Pandey, et al [17].The plausible examination for this can be seen in the fact that *T.rubrum* was generally linked to be chronic .

Male to female ratio of infection in the present study were 11:27 positive cases it means 1:2.4 which is in contrasts with the finding of other reports observations Muhammed shahzad *et al* ,[18], Venugopal and Venugopal ,[19,20] they found that the male to female infection ratio were 1:2.5 ,also Abanmi A, *et al* [21], and Venkatesan *et al*[22] reported that the male to female infection ratio was (68.2 to 31.8%) from a total examined 305 clinical samples .Concerning the age susceptibility to dermatophyte infection appears to be more common in adult within age group from 15-45 years in which 453 positive cases (60%) were recorded, but 246 positive dermatophytes cases (32.58%) were observed in the group of age ranged between 5-15 years and also 56 dermatophyte positive cases (7.42%) were found at the group of age above 45 to 60 years. No recorded positive cases to dermatophytes under 5 years or above 60 years, all the finding in this study were compatible with the finding of others as Gebreabiezgi and Adane [23], in which they found that the main infected patients within age group of 25-44 years .

With reference to the nationality in this study results showed that males and females Saudi were more infected with dermatophytes more than males and females non-Saudi in which the ratio of infection was (2.5 to 1) or (72%to 28%). The increase of ratio of infection for males and females Saudi may be because of large number of Saudi patients visited the Clinic comparing to non-Saudi and also due to increase the concern against any infection affect skin and its appendages .

V. Conclusion

Further studies on dermatophytes needs to be done on other regions of Saudi Arabia in order to establish the true prevalence and distribution of dermatophyte species.

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