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Assessment of Clinical Features of Tinea Capitis Cases in Erzurum

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ABSTRACT

Tinea capitis is a common fungal infection of the scalp and hair shafts in children. The current study aimed to evaluate 63 patients with tinea capitis, who had been referred to the dermatology outpatient clinics of two hospitals.

Data were collected from the patient files that included the demographic characteristics including age, gender, residing place (rural, urban),the history, duration, contact with animal, patient's medical history, drugs used, family history, clinical findings, clinical classification, hair loss, fluctuation, lymphadenopathy (LAP), reflection with wood examination, id reaction and hyphae on microscopic examination.

The study involved 63 patients with tinea capitis (the mean age was 5,7 years; 69,8% of whom were males). Of patents, 56,6% had inflammatory tinea capitis, 66,7%, had hair loss ,78,3% LAP, 85,5% hyphae and 78,6% reflection with wood examination. Of patients, 71,9% were living in rural areas.

Tinea capitis is a significant dermatophyte infection in children in Turkey and the role of clinical findings in diagnosis and in treatment should not be ignored.

Keywords: Clinical features, Erzurum, tinea capitis

Introduction

Tinea capitis refers to a condition in which the hair follicle and surrounding skin are infected with dermatophytes with invasion of the hair shaft on the scalp (1). Tinea capitis is the most common dermatophyte infection in children (1,2). A low socioeconomic status and poor hygiene significantly contributes to the incidence of the disease and living conditions with household crowding also facilitates its spreading (1,2). The clinical classification involves non-inflammatory (tinea capitis superficialis), inflammatory (tinea capitis profunda) and favas (tinea capitis favosa) (1).

Tinea capitis is caused by *microsporums and tricophytons* spp (1,2,3), which are found on human skin and keratinized tissue grouped as anthropophilic, zoophilic geophilic (soil associated). Dermatophytes of geophilic origin can spread to animals and then humans. Dermatophytes of zoophilic origin can spread to the soil and from where to humans (1). Anthropophilic fungal elements can spread among family members and friends. Contamination can be caused by direct contact or sharing objects. The disease can be caused by zoophilic factors spreading from cattle, goats-sheep, cats and dogs and rodents (1,4). The typical lesion of superficial tinea capitis is 2-6 cm in wide is rounded or oval, one or more itching, squamous, alopecic plaques on the scalp. The surface can also be erythematous. Tinea capitis profunda can be caused by untreated superficial tinea capitis or may emerge directly as pustular folliculitis. Damage to hair follicles with this form leads to pustular abscesses and kerions. Kerions are alopecic erythematous and edematous nodules on the scalp that have an unpleasant odor, discharge, and are painful and have swollen pustules. Tinea capitis favosa is characterized by perifollicular, yellow-coloured, unpleasant-odour scutulum. The incidence increases in people with nutritional deficiencies and systematic diseases (3,4).

Tinea capitis maintains its importance as a serious hair disease in developing countries (5). Prevalence studies were carried out in Turkey in regions where there are high cattle and goat-sheep farming rates, with a low socioeconomic and poor hygiene status. The prevalence studies carried out with primary school students showed that the rates varied from 0,05% to 0,3% and varied by provinces (1). A study carried out in Erzurum in 1999 showed that tinea capitis had a prevalence of

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0.08% (6).

Tinea capitis is still a common health condition observed in children in that region. Early diagnosis and treatment are essential because tinea capitis can lead to cicatricial alopecia. This study aims to evaluate the methods for diagnosis at the outpatient clinics by presenting the demographic and clinical features of patients diagnosed with tinea capitis from Erzurum and surrounding areas.

Materials and Methods

The current retrospective study included 63 patients with tinea capitis (44 males (69,8%) the mean age 5,7 years ; min 1, max 13; ± 3,4 yrs.) who presented to the dermatology outpatient clinic of two hospitals between 2012 and 2013. The data included the duration of the infection, the location (Erzurum's districts), contacts with animals (cattle, goats-sheep, cats-dogs and other), family history, medical history, the use of systematic and/or topical anti-fungal or steroids before presenting to the outpatient clinic. The clinical evaluation revealed erythema, pustule, alopecia, squam, fluctuation and the clinical classification of the disease, the presence of lymphadenopathy (LAP), the size of LAP (the mean LAP size if more than one LAP) and the location of the LAPs, the presence of id reaction and type; the results of microscopic examination (under outpatient conditions to evaluate the presence of hypha with KOH treated squam and hair roots), the presence of fluoresce at Wood's lamp examination and color of fluoresce. The study data was analysed by SPSS 13.0. One-sample Kolmogorov-Simirnov, Chi-square, Independent-Samples T-test and the Mann-Whitney U tests were used for statistical evaluation.

Result

The demographic features and medical history are summarized in Table1; the clinical classification and hair loss, microscopic as well as Wood's lamp examination findings are summarized in Table2.

The patients were living in diverse districts of Erzurum and rural districts outside of Erzurum. The addresses of 6 of patients could not be determined; 16 patients (28,1%) were living in central areas and 71,9% in rural areas.

The clinical examination revealed that, of lesions, 35, 3% were located in parietal, 31,5% in multiple sites , 17,6% occipital, 11,8% frontal and 3,9% on the temporal areas. Of 60 patients, 47 (78,3%) had lymphadenopathy (LAP) ; 33,3% of LAPs were located on cervical, 23,1% on post auricular, 12,8% bilateral, 7,7% on sub-occipital region and 23,1% were scattered . 40,0% patients had LAPs <1cm in size, %32,5 had LAPs >1 cm and 15,0% had multiple LAPs >1 cm, and %12,5 had multiple LAPs <1cm; 6,5% of patients had id reaction . Two patients had local vesicular id reaction and two had systemic papulosquamous disease. Of 56 patients, 44 (78.6%) undergoing wood lamp examination had fluorescent reflection. Of 62 patients, 53 (85,5%) had hypha, who underwent examination with KOH treated materials under light microscopy. Nine patients (14,5%) had native negative results. Of whom, 5 who were native negative had received systematic and/or topical treatment. Of 4 patients, 3 had hair loss at the examination, 2 of whom had fluctuating nodular lesions and pustules and the other one had a fluoresce reflection at Wood's lamp examination and LAP on sub-occipital region.

In the statistical analysis, females were significantly younger than the males. No significant difference was found according to sexes in history of contact with animal, hair loss, native positivity, clinical classification of tinea capitis, presence of lymphadenopathy, reflection with wood examination, number of lesions on scalp, size of lesions, duration of disease. Also no significant difference was found in hair loss, native positivity, clinical classification of tinea capitis, age, number of lesions on scalp, size of the lesions, duration of disease, according to presence of lymphadenopathy. The statistical analyzes are summarized in Table-3 and Table-4.

Discussion

Tinea capitis is the dermatophyte infection of the hair and scalp. It is the most common superficial fungal disease in children (3). Tinea capitis is observed as the most common childhood hair and scalp disease followed by seborrheic dermatitis and alopecia areata (5). A study in Kayseri showed that tinea capitis is the most common clinical type of superficial fungal infections seen in children (7).

Tinea capitis is usually seen before puberty. The fungistatic oil found in a sebum secreted after puberty makes the condition rare in adults (3). The mean age of 63 patients included in the present study was 5,7 years, ranging from 1 to 13 years. A study in Erzurum reported tinea capitis at

Table 1. Sociodemographic Charcteristics of Patients

Demographic Evaluations	N	%
Gender		
Male	44	69,8
Female	19	30,2
Total	63	100
Contacts with animal		
No	6	10,0
Yes	54	90,0
Total	60	100
Contacts with animal		
Goats-sheep	39	72,2
Cattle	2	3,7
Cat-Dog	4	7,4
Unidentified (more than one)	6	11,2
Other	3	5,5
Total	54	100
Family History		
Yes	7	11,1
No	56	88,9
Total	63	100
Drug use before examination		
Topical (antifungal)		
Yes	11	17,7
No	51	82,3
Total	62	100
Systemic (antifungal)		
Yes	5	8,1
No	57	91,9
Total	62	100
	Mean (±)	min-max
Age	5,7 (3,4)	1-13

ages 6 to 9 years (8). Calka et al. found that the mean age of patients with tinea capitis was 6,8 years (1 to 18 years) (9), and another study that included 234 patients showed that the age range 1 to 12 years (10).

As short hair allows the infection to reach the scalp easier, the disease is more common in males (3). A clinical study involving 104 patients, showed 63,5% were male (8), and another study including 40 patients with tinea capitis, 28 were male (11). In the present study 44 patients (69,8%) were male. Household crowding, a low socioeconomic status and poor hygiene may contribute to the occurrence of the disease (2,3). Of 63 patients included in the present study 28,1% were from central Erzurum and 71,9% from the rural areas. In the studies of Altindis et al., 14 of 16 patients with tinea capitis were residing outside the city and that the prevalence of the infection was closely associated with poor hygiene and low economic status (12). In the present study, only 7 of the 63 patients had a family history. This suggests contacts with animal rather than human to human transmission.

The spread of anthropophilic fungal elements between family members and friends can be by direct contact or by means of the shared use of objects such as infected hats, combs, scissors and brushes. Zoophilic factors can lead to the disease by cattle, goats-sheep, cats and dogs and rodents (infection could occur by direct contact with animals or by using infected objects) (1,4). A study

Table 2. Clinical, Microscopic and Wood Examination Findings

Clinical Findings	N	%
Clinical classification		
Superficial tinea capitis	28	44,4
Inflammatory tinea capitis	35	56,6
Favus	0	0
Total	63	100
Hair loss		
Yes	42	66,7
No	21	33,3
Total	63	100
Lymphadenopathy		
Yes	47	78,3
No	13	21,7
Total	60	100
Id reaction		
Yes	4	6,5
No	58	93,5
Total	62	100
Microscopic examination (presence of hyphae)		
Positive	53	85,5
Negative	9	14,5
Total	62	100
Reflection with wood examination		
Yes	44	78,6
No	12	21,4
Total	56	100
	Mean (±)	min-max
Number of lesion on scalp	1,7 (1,4)	1-6
Size of lesions* (cm)	5,3 (3,0)	1-15
Disease Duration (day)	28,5 (39,8)	2-180

*The size of the lesion is calculated as the mean diameter by calculating the average of the widest and narrowest diameters; the total of the mean diameters was used in the presence of more than 1 lesion

by Zarra et al. examining inflammatory tinea capitis in Tunisia, reported contacts with animals (17 patients had contact with cats , 13 with dogs ,5 with rabbits) 35 of the 121 patients (13). Six patients in the current study had no contact with animals , with %90 (54) patients had contact with animals (of whom 39 had possible contact with goats-sheep, 2 with cattle, 4 with cats and/or dogs, 6 with all animals listed, 3 with other animals which were not identified). High rates of contact with animals despite low rates of family history, suggests that zoophilic factors are the main cause for tinea capitis in Erzurum where animal breeding is one of the main means of living.

Tinea capitis lesions may persist for weeks or months (3). We noted that the mean duration of the infection was 28,5 days (1to 180 days). Another study from Erzurum found that the duration of the disease for most patients ranged from 1 to 30 days (6). Metin et al. similarly found that 80% patients presented to a medical facility within the first month (11). We found no significant relationship between the size and numbers of the tinea capitis lesions, the presence of LAP and the duration of the disease (p>0,05).

Tinea capitis is clinically divided into three groups: superficial tinea capitis, inflammatory tinea capitis profunda (kerion celsi) and tinea capitis favosa (favus) (1).Of patients in the current study, 55,6% (35) had tinea capitis profunda and 44.4% (28) superficial tinea capitis, with no tinea capitis

Table 3. Statistical analysis according to gender (history of contact with animal, hair loss, native positivity, reflection with wood examination, clinical classification of tinea capitis, presence of lymphadenopathy, age, number of lesions on scalp, size of lesions, duration of disease)

	Gender			
	Female (n)	Male (n)	Total (N)	P-value
Contact with animal				
Yes	15	39	54	0,24*
No	3	3	6	
Hair loss				0,45*
Yes	12	30	42	
No	7	14	21	
Native positivity				
Positive	16	37	53	0,56*
Negative	3	6	9	
Reflection with wood examination				
Yes	12	27	39	0,32*
No	7	10	17	
Clinical classification				
Superficial tinea capitis	8	20	28	0,51*
İnflammatory tinea capitis	11	24	35	
Lymphadenopathy				
Yes	14	33	47	0,46*
No	3	10	13	
	Mean (±)	Mean (±)		
Age	3,9 (2,9)	6,5 (3,3)	63	<0,00**
Number of leison on scalp	2,3 (1,9)	1,4 (1,9)	63	0,06***
Size of lesions (cm)	5,5 (3,1)	5,3 (3,0)	63	0,92***
Duration of disease (day)	30,4 (38,4)	28,4 (28,9)	61	0,67***

*Statistically analysed with Chi-Square Test
One-sample Kolmogorov-Smirnov Test was used for analysis of normal distrubition
**Statistically analysed with Independent Samples T-test
***Statistically analysed with Mann-Whitney U Test

favosa detected. A study in Van found tinea capitis profunda at a rate of 65% (11). One study from our province found tinea capitis profunda as the most common type (14) while in another study all patients with tinea capitis had inflammatory tinea capitis profunda (kerion celsi) (8). In our series, the number of patients with tinea capitis profunda and those with superficial tinea capitis rations were similar, no patient with favus was present, which could be attributed to better socioeconomic and higher education status and increased access to health care services.

Our patients had the squamous alopecic plaques and lesions with inflamed nodules approximately 5,3 cm in size (1 to 15 cm) and the number of lesions were on average 1,7 (1 to 6). The clinical examination found the 35,3% lesions to be parietal, 17,6% occipital, 11,8% frontal, 3,9% to be temporal and 31,5% to be found on more than one area. All clinical forms of tinea capitis may present cervical or occipital lymphadenopathy and this finding is important in terms of the clinical diagnosis (15,16). Of 60 patients, 47 (78,3%) had LAP of which 33.3% were posterior cervical, 23,1% post auricular, 12,8% bilateral cervical, 7,7% sub occipital and 23,1% spread out around neck and auricula. The present study found that 67,9% of patients with superficial tinea capitis had LAPs and 80% of those with inflammatory tinea capitis profunda (kerion celsi) had LAPs. There was no significant difference in the presence of LAP (p>0,05). Id reaction (dermatophyte) is an immunological response developed against fungal antigens. To evaluate the eruption as an id reaction it needs to be away from the fungal areas, the lesions should be fungus-free, and it should regress with fungal treatment (1,3).

Table 4. Statistical analysis according to precense of lymphadenopathy (hair loss, native positivity, clinical classification of tinea capitis, age, number of lesion on scalp, size of leisons, duration of disease)

	Lymphadenopathy			
	Positive (n)	Negative (n)	Total (N)	P-value
Hair loss				
Positive	31	16	47	0,50*
Negative	8	5	13	
Native positivity				
Positive	40	6	46	0,31*
Negative	10	3	14	
Clinical classification				
Superficial tinea capitis	19	9	28	0,63*
İnflammatory tinea capitis	28	4	32	
	Mean (std)	Mean (std)		
Age	5,9(3,2)	5,5 (4,1)	60	0,74**
Number of leisons on scalp	1,7 (1,5)	1,6 (1,3)	60	0,81***
Size of leisons (cm)	5,5 (3,0)	4,7 (3,4)	60	0,23***
Duration of disease (day)	29,1(44,2)	25,1(22,6)	60	0,31***

*Statistically analysed with Chi-Square Test
One-sample Kolmogorov-Smirnov Test was used for analysis of normal distrubition
**Statistically analysed with Independent Samples T-test
***Statistically analysed with Mann-Whitney U Test

It usually emerges on the face and spreads towards the abdomen. It is observed as itchy papules or in vesicular form. We observed id reaction in 4 patients (6,5%). The reaction was papulosquamous in two patients and in vesicular form in the other two. Two of these patients presented superficial and the other two inflammatory form.

The Wood's lamp examination is carried out in a dark room with a Wood's lamp that emits 365 nm wavelength UV light. Only ectothrix types give a yellow-green fluorescent under the Wood's lamp. However, the method gives rapid results and helps diagnosis because it enables to collect samples from the areas that glow (1,17). A yellow green fluoresce was observed in 44 of the 56 patients undergoing the examination.

Previous treatments administered to patients with tinea capitis can modify the clinical presentation and lead to difficulties in diagnosis. In the current study, 11 patients received topical treatment while 5 had topical and/or systematic antifungal treatment. To determine the fungal elements, squam and hair follicles are collected from the scalp, treated with 10-20% KOH (potassium hydroxide) and examined after 10-30 minutes microscopic examination with light microscopy. Hyphae and spores of dermatophytes are sometimes not seen in inflammatory lesions on microscopic examination (1). Previous treatments can also lead to negative results on microscopic examination. The diagnosis and treatment may have to be decided clinically. No fungal elements were observed in 9 of 62 patients examined with light microscopy, 5 of whom had been administered topical and/or systematic antifungal treatment by other physicians. Of 4 patients, 3 were diagnosed with nodular lesions leading to alopecia, pustules and fluctuations and 1 patient was diagnosed with a fluoresce on a Wood's lamp examination, and LAP on sub-occipital region

Consequently, tinea capitis is the most common superficial fungus infection observed in children. It has a wide clinical spectrum that includes squamation resembling seborrheic dermatitis, comorbid local lymphadenopathy and alopecic severe pustular nodosities. Early diagnosis and treatment are essential as it can lead to cicatricial alopecia. We are in the opinion that good knowledge of the clinical findings and diagnostic methods such as the Wood's lamp examination and microscopic examinations that give rapid results will reduce the morbidity and sequels of the disease. This study provides detailed data on tinea capitis in outpatient conditions.

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