

CLINICAL AND MYCOLOGICAL FEATURES OF SCALP RINGWORM IN CHILDREN'S HOSPITAL IN RABAT

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ABSTRACT

Introduction : The objective of this study was to determine the prevalence, clinical and mycological characteristics of *Tinea capitis* (TC) in children's hospital in Rabat.

Materials and Methods: In our study, a total of 1270 samples were processed and all were examined by KOH preparation and fungal culture methods.

Results: In present study, males are infected more than females with a ratio of 1.17; the incidence of *Tinea capitis* is 25.41% among children aged 1-15 years. The positivity rate of KOH preparation is 77.54%. *Trichophyton violaceum* is the commonest fungal isolate (82.3%) followed by *Microsporum canis*. Inflammatory ringworm occurs in rural areas.

Conclusions: In our geographical area, microsporiosis which was almost absent is in full progression, whereas ringworm *favosa* is in net regression.

Keywords: Ringworm-Scalp- *Microsporum canis*

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INTRODUCTION

Tinea capitis is a fungal infection of the scalp. The disease is considered to be a form of superficial mycoses or dermatophytoses. It is caused by dermatophyte species of genera *Trichophyton* and *Microsporum* which parasitize on corneous structures, such as stratum corneum, hair or nails (1). *Human-to-human* transmission of an anthropophilic infection usually requires contact. The source of infection of a zoophilic dermatophytes, are mostly domestic animals, but infection with geophilic dermatophytes usually happens as a result of contact with soil (2).

Microsporum is a zoophilic, anthropophilic or geophilic dermatophyte and *Trichophyton* can be zoophilic, anthropophilic or geophilic.

TC has three clinical forms: TC superficial (non-inflammatory), TC profunda (inflammatory) and TC favosa (favus) (1,2).

MATERIAL AND METHODS

The study was carried out in the mycology laboratory of children's hospital. This included the children with clinical symptoms (symptomatic).

A total of 1270 children aged 1 -15 years were examined for *Tinea capitis* infection.

Scalp skin scraping and hair stubs were collected into sterile plates and examined in direct microscopy. 30% KOH mount examination done and samples were inoculated on sabouraud's dextrose agar with or without chloramphenicol and cycloheximide (antibiotics and antifungals were added to inhibit bacterial and saprobic fungal contamination).

A filtered ultraviolet light (Wood's) elicits a green fluorescence from some dermatophytes fungi, mainly *Microsporum* species, in hair infections. *Trichophyton* species with exception of *T. schoenleinii*, are non-fluorescent (2).

The cultures were incubated at 26°C for a period of 1 month before giving negative result (the media was examined regularly for 4 weeks).

On direct microscopy, the presence of fungal hyphae and /or spores within (endothrix) and /or around (ectothrix) hair shafts was considered to be positive test.

If any growth was found on culture, species of dermatophytes were identified by macroscopic (colonial morphology, pigment production) or microscopic morphology (formation of macroconidia and microconidia or typical elements) (2). Whenever, urease and hair penetration hair were done. The results obtained

in this study are presented using descriptive statistics (frequency and percentage).

RESULTS

In this study, of 6106 samples examined in our laboratory, 1270 (20.8%) patients were infected with either one of two dermatophytes (*Trichophyton* or *Microsporum*).

By age range, the mean average age was 7 ± 6 years with extreme of age 2 months and 15 years. *Tinea capitis* was noted in pre-school and school age group, the highest prevalence was observed in males.

There was no significant difference between the prevalence of dermatophytes agents isolated and age groups.

But according to sex, males were significantly infected compared to females.

In present study, total positivity rate for fungal infection by KOH examination and/or culture examination was 77.54%. A total of the clinically diagnosed cases were positive, in this, culture was positive in only 47 cases showing low positivity rate of culture. 53 cases were diagnosed negative in direct KOH preparation but showed fungal growth.

As is evident by table 1, the most common isolate is *Trichophyton violaceum*, (82.1%) (endothrix ringworm), the second common isolate is *Microsporum canis* (11.01%) (endo-ectothrix ringworm). Two species of *Trichophyton* were isolated from inflammatory TC: *Trichophyton mentagrophytes* and *Trichophyton ochraceum* (2.75%). Only one species, *Trichophyton schoenleinii* from TC favosa was isolated (2.71%) (Table I

Table I: Distribution of *Tinea capitis* by species and positive culture

Isolated Dermatophytes	Frequency (n)	Positive culture (%)
<i>Trichophyton violaceum</i>	1007	82.1
<i>Microsporum canis</i>	135	11.1
<i>Trichophyton schoenleinii</i>	33	2.7
<i>Trichophyton mentagrophytes</i>	22	1.8
<i>Trichophyton rubrum</i>	21	1.71
<i>Trichophyton tonsurans</i>	2	0.16
<i>Trichophyton ochraceum</i>	3	0.24
<i>Microsporum audouinii</i>	2	0.16
<i>Trichophyton rosaceum</i>	1	0.08
Total of Positive culture	1226	100 %

DISCUSSION

Tinea capitis is a common fungal infection in children, particularly among those living in unhygienic conditions in urban or rural area. In this study, we evaluated clinical and mycological characteristics of *Tinea capitis* in urban area. Findings from this study revealed an overall prevalence of 25.41 %.

This rate was similar to that obtained in previous studies in urban area in Morocco (3,4). But it was found to be less than those obtained in Southern Ethiopia (59%) and Kenya (81.2%). This low prevalence rates could be associated with the environmental conditions and socioeconomic level of populations (2,5,6). We think that this frequency is underestimated because investigated patients were represented by those who ask for medical care.

Various views exist regarding the sexual predominance of TC. In our study, males were more affected by *Tinea capitis* than females. The observed high prevalence rates could be due to the fact of shorter hair, this allows to circulate easily the fungi spores. These findings were contrary to those obtained in Nigeria and India where girls had high prevalence rates of infection than boys (5,7-10).

However, there was no significant difference at age groups related to dermatophytosis infection.

In the present study, a school age group patients showed an anthropophilic TC as the commonest manifestation, this finding corroborates with the other studies (8-11). It is the most commonly diagnosed dermatophytosis of childhood and is more frequently seen among prepubescent children, its prevalence decrease with age, this could be explained by acid sebaceous gland secretions (changes in hormones).

On mycological diagnosis, the KOH preparation has shown good sensitivity in comparison with culture. In our study, KOH positivity rate is 77.54%. The study is in lines with the other studies (2,8-10). The other studies revealed high positivity culture rate which is contrast to our study this can be explained by drying out procedure. In the present study, two genera of ethiological agent of TC was identified. *Trichophyton violaceum* (anthropophilic) and *Microsporum canis* (zoophilic) were the most predominant species isolated in the present study. These anthropophilic dermatophytosis are most frequently incurred by contact with an infected child, either directly or via fomites, on the other hand, cats and dogs are the reservoirs for *M. canis* in many countries of the Mediterranean basin. These results do not match with previous studies carried out in sub-saharan countries in

which *Trichophyton tonsurans* and *Trichophyton soudanense* were the most frequent species isolated (6,7,8). In our study, among this genus, *T. tonsurans* was least isolated because isolation of different species of dermatophytosis agent varies from one ecological niche to another.

T. rubrum was detected with low rates being registered worldwide.

T. schoenleinii causes a chronic form of TC (rare type of inflammatory TC) was in net regression in our country and it has disappeared from developed countries (5, 6, 10).

This distribution pattern of dermatophytes infection in the world has been attributed to factors such as tropical climate, life-style, population migration patterns, presence of immunodeficiency diseases in the community and patients attitude to treatment following clinical diagnosis (10,12).

CONCLUSION

In this study, the high sensitivity of KOH examination comparing to culture was demonstrated. *Trichophyton violaceum* was considered as the most prevalent ethiological agent. As for *Microsporum canis* was on the increase, whereas *Trichophyton schoenleinii* was isolated from samples sporadically.

Fundamentally, two risk factors were described: low socio-economic level and poor personal hygiene.

An improvement of living conditions, establishment of an early diagnosis and started treatment were the measures required to prevent the outbreak.

Disclosure

The authors report no conflicts of interest in this work.

REFERENCES

1. Antoni Bennassar, Ramon Grimalt, Management of *Tinea capitis* in childhood Clinical, Cosmetic and Investigational Dermatology. (2010) 3:89-98.
2. Narcisa Mandras, Janira Roana, Ornella Cervetti, Michele Panzone and Vivian Tullio. A case report of tinea capitis in infant in first year of life Mandras et al. BMC Pediatrics (2019) 19:65.
3. A. Elmaataoui, Z. Zeroual, M. Lyagoubi, S. Aoufi. Profil étiologique des teignes du cuir chevelu à l'hôpital Ibn Sina de Rabat (Maroc). Journal de Mycologie Médicale. (2012) 22 :261-264.
4. W. Oudaina, H. Biougnach, S. Riane, I. El Yaagoubi, R. Tangi, L. Ajdae, A. Agoumi, H. Tligui. Epidemiology of *Tinea capitis* in outpatients in Children's Hospital in Rabat (Morocco). Journal de Mycologie Médicale (2011) 21:1-5.
5. Josephine Dogo, Seniyat Larai Afegbua, and Edward Christopher Dung. Prevalence of Tinea Capitis among School Children in Nok Community of Kaduna State, Nigeria. Hindawi Publishing Corporation Journal of Pathogens. (2016) 6.
6. Desalegn Tsegaw Hibstu and Deresse Legesse Kebede. Epidemiology of Tinea Capitis and Associated Factors among School Age Children in Hawassa Zuria District, Southern Ethiopia. J Bacteriol Parasitol. (2017) 8:2 .
7. Silverberg NB, Weinberg JM, DeLeo VA. *Tinea capitis*: focus on African American women. J Am Acad Dermatol. (2002) 46: 120-4.
8. Jedidah Ndunge Moto, John Muthini Maingi and Anthony Kebira Nyamache. Prevalence of Tinea capitis in school going children from Mathare, informal settlement in Nairobi, Kenya. BMC Res Notes (2015) 8: 274.
9. Niema Aqil, Hanane BayBay, Kaoutar Moustaide, Zakia Douhi, Sara Elloudi and Fatima Zahra Mernissi. A prospective study of *Tinea capitis* in children: making the diagnosis easier with a dermoscope. Journal of Medical Case Reports (2018) 12:383.
10. Ruchita O. Attal, VijayshriDeotal, Akshay Yadav .Tinea Capitis Among Primary School Children: A Clinicomycological Study in a Rural Hospital in Central India. International Journal of Current Research and Review. (2017) 9: 26-29.
11. Bhavsar Hitendra K, Modi Dhara J, Sood Ndhi K, Shah Hital S. Study of superficial mycoses with clinical mycological profile in tertiary care hospital in Ahmadabad, Gujarat. National Journal Of Medical Research (2012) 2: 160-164.
12. Hashem Sheikh. Epidemiology of dermatophytes in the Eastern Province of Saudi Arabia. Research Journal of Microbiology. (2009) 4: 229-234.