

Isolation and Identification of Causative Fungi that cause Tinea Capitis

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Abstract

The study includes isolation and identification of fungal causative agent of Tinea capitis. 50 specimen were collected from out patients of Tikrit hospital during the period from the start November 2011 to the March 2012. Dermatophytes were 96% and 4% of non dermatophytes. These specimen were examined by direct mount with potassium hydroxide (KOH 10%) and culture on Sabourauds Dextrose Agar plates for isolation and identification of causative fungi .The results showed that more types of fungi , 25% of *Trichophyton violaceum* , 15% of *Microsporum audouinii* , 5% of *Trichophyton sulphureum* and 5% of non causative agents such as *Aspergillus* 3% , *Fusarium* 2% .

Introduction

The dermatophytes is superficial fungal infection usually involve the skin , hair and nails .

The group of fungi most commonly responsible for causing infection of these sites were known as dermatophytes , include the genera *Trichophyton* , *Microsporum* and *Epidermophyton* ⁽¹⁾ .

Tinea capitis (also known as Herpes tonsurans , Ring worm of the hair, Ring worm of the scalp and Tinea tonsurans)in which the essential features is invasion of hair shafts by a dermatophyte fungi ⁽¹⁾ . Three types of in vivo hair invasion were recognized ⁽²⁾ :

A) Ectothrix invasion is characterised by the development of arthroconidia on the outside of the hair shaft . The cuticle of the hair is destroyed and infected hairs usually fluoresce a bright greenish yellow color under wood s ultraviolet light . Common agents include *Microsporum* spp .

B) Endothrix hair invasion is characterised by the development of arthroconidia within the hair shaft only. The cuticle of the hair remains intact and infected hairs do not fluoresce under woods ultraviolet light . All endothrix producing agents are anthropophilic , such as *Trichophyton tonsurans* and *Trichophyton violaceum* .

C) Favus usually caused by *Trichophyton schoenleinii* , produces favus-like crusts or scutula and corresponding hair loss .

Tinea capitis primarily affects school-aged children . Tinea capitis have several types of inflammatory and non –inflammatory type , black dot tinea capitis and tinea tonsurans infect glabrous skin or nails with involment ⁽³⁾ .

It may appear as thickened, scaly, and sometimes boggy swellings, or as expanding raised red rings (ring worm). Common symptoms are severe itching of the scalp, dandruff and bald patches where the fungus has rooted itself in the skin. It often presents identically to dandruff or seborrheic dermatitis ^(4,5) .

Microsporum infection presents as gray patches of hairs that were lusterless because of a coating of spores . Inflamed areas usually have scales , pustules and erythema ^(6,7) .

Materials and Methods

Collection of samples

Fifty patients suffer clinically from dermatophytosis disease were selected in ages ranged from five years to sixty years old were selected randomly from the outpatients dermatological clinic of Tikrit Teaching Hospital, clinical diagnosis in each case was established by the clinical examination as a dermatophytosis .

Hair sample were taken by clean the infected area with 70% ethanol to remove contaminants such as bacteria . Plucked some hair with root (not cut the hair) and put over slide cut to small fragments placed a drop of potassium hydroxide (10% KOH) which covered with coverslip then warmed gently and examined under a microscope ⁽⁸⁾ .

Specimen Analysis

There were two examinations for analysis specimens:

- 1- Direct examinations by (KOH) .
- 2- Culture ⁽⁸⁾ .
- 3- Lacto phenol cotton blue (L.P.C.B) ⁽⁹⁾ .
- 4- Fluorescent microscope .

Procedure

Direct potassium hydroxide (KOH) examination of infected hair to show ectothrix or endothrix types of hair invasion .

a) Ectothrix :-appearance small spores (2-3 µm) or (3-5 µm) in diameter form thin cover or chains outer hair ⁽⁸⁾ .

b) Endothrix :- appearance spores (5-8 µm) in diameter form chains inner hair , thickening or spiral and cutting to small hair ⁽⁸⁾ .

c) Favic hair : hyphae appearance inner and during a long hair , fat droplet in the region when lysis of hair ⁽⁸⁾ .

Culture

Samples cultured directly on the media Sabouraud dextrose agar (SDA) ^(9,10) and corn meal agar, incubated in cooled incubator at 28-30 c° and examined every 2-3 days .Negative cultures were discard after 3-4 weeks were identical ⁽¹¹⁾ .

Tests for growth of *Microsporum* spp. On rice grains ⁽¹¹⁾ .

Result and Discussion

This results shows 12 patients were from the urban area were 32 patients were from the rural area (Table

1). Table (2) shows 9 patients were male ,41 patients were female and table (3) show the causative fungi .

Table (1) Relation between clinical form and residence

Clinical form	Urban	Rural	Total
Tinea Capitis	10	40	50

Table (2) Relation between clinical form and sex

Clinical form	Male	Female	Total
Tinea Capitis	9	41	50

Table (3) Types of causative fungi and number of isolates

Causative fungi	Isolation number
T. violaceum	25
M. audouinii	15
T. sulphureum	5
Non dermatophytes	3
Aspergillus	
Fusarium	2
Total	50

The infection by Tinea capitis in rural (40%) compare with that in urban (10%) as shown in Table (1) . The results concluded by Yehia, Tinea capitis recorded high percentage for people in rural 45.45% compare with that from urban 25.78% . These results relate to many reason that rural places severe from , such as decreased healthy education , low living aspects , many people living inside house and moreover touching with animal inside or outside the house ⁽¹²⁾ .

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The results of this study show that Tinea capitis was differences in infection percentage among male (18%) and female (82%) as show in Table (2) . This result differ from that founded by other researchers in Iraq ⁽¹²⁾ . in Mosul, Fathi and Al-Samarai ⁽²⁾ in Tikrit . This differences in results due to healthy habit and personal cleaning ⁽¹⁴⁾ .

In this study children more than other infection by Tinea capitis because absceence of saturated fatty acids in their skin, that gave them normal protection against dermatophytes ⁽¹⁵⁾ . The activity of secretry sebaceous glands and saturated fatty acids was antifungal agents , sebum increased in maturity stage ⁽¹⁶⁾ .

Direct microscope examination of the clinical specimen was rapid method and subsequently culture identification of the organisms . In our study directly examined clinicals specimens found that the direct examination with KOH preparation was highly positive ⁽¹⁷⁾ .

In the present study it was found that 45% of etiological agents were dermatophytes, while 5% were non dermatophytes (Table 3) .

Trichophyton violaceum was the common agent 25% followed by **Microsporum audouinii** 15%, **Trichophyton sulphureum** 5% and 5% was non dermatophyte (3% **Aspergillus** and 2% **Fusarium**). These results were agreement with other recent study in Iraq ^(18,19) .

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عزل وتشخيص الفطريات المسببة لسعفة الرأس *Tinea capitis*

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الملخص

تضمنت الدراسة عزل وتشخيص الفطريات المسببة لسعة الرأس *Tinea capitis* ، حيث تم جمع (50) عينة من الأشخاص الوافدين الى مستشفى تكريت التعليمي للمدة من بداية كانون الثاني الى نهاية اذار 2012 . ولغرض تشخيص العينات تم فحص النماذج بواسطة هيدروكسيد البوتاسيوم (10%) ومن ثم زرعت على وسط السابروود دكستروز اكار . حيث كانت نسبة العزل 96% من الفطريات الجلدية و 4% من الفطريات الغير الجلدية . وظهرت النتائج انواع عديدة من الفطريات المسببة لسعفة الرأس .

حيث تم عزل 25% من فطر *Trichophyton violaceum* و 15% من فطر *Microsporum audouinii* و 15% من فطر *Trichophyton sulphureum* و 5% من الفطريات الغير جلدية (3% *Aspergillus* و 2% *Fusarium*) .