Dermatophytes Isolated From Clinical Samples of Children Suffering From Tinea Capitis In Ismailia, Egypt

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Abstract: Objective: To evaluate the prevalence of tinea capitis in children, among the patients attending El-Sheikh Zaid dermatology center, Ismailia governorate, this has got an average new outpatient turnover of 2000-3000 per year. Methods: During the period of 2010–2011, a prospective cross-sectional study was carried out in 56 children between the age’s 2 and 10 years. Examination of the scalp was performed to identify lesions compatible with tinea capitis. Cultures of hair samples were done, then macroscopical and microscopical examination were performed for dermatophyte isolates. Results: Dermatophytes were isolated in 52 (92.9%) of the samples and the predominant etiologic agents were Trichophyton violaceum in 21 (40.3%) of the cases, Microsporum canis in 16 cases (30.8%), Microsporum gypseum was isolated from 9 cases (17.3%), each of Trichophyton verrucosum and Microsporum audouinii was isolated from 3 cases (5.8%). Dermatophytes isolated from collected samples were higher in male 43 (82.7%) than female 9 (17.3%). Conclusion: The results of this study demonstrate a high prevalence of tinea capitis among children of Ismailia, governorate, especially among males. On the other hands, Trichophyton violaceum and Microsporum canis were the most common agents in tinea capitis.

Key words: Prevalence of tinea capitis, dermatophytes, children

INTRODUCTION

Dermatophytosis is a common cutaneous fungal disease caused by species belonging to the genera Trichophyton, Microsporum and Epidermophyton. Tinea capitis, a dermatophyte infection of the scalp caused mainly by Trichophyton and Microsporum species, remains common among the pediatric population. Recently, this disease has been recognized as an important public health problem in the United States with 13% of school children, especially those of African-American descent, testing positive for dermatophytes (Ghannoum et al., 2003). Tinea capitis has decreased in developed countries, while it presents a high prevalence in developing countries (Caputo et al., 2001). In Egypt, limited information is available on the prevalence of t. capitis in the infantile population. In a study done by (Hanaa, 1987) on T. capitis, in which, most of cases aged 3-9 years old and the infection was more common in boys (54%) than in girls (46%). In 2001, Nermin performed a study on T. capitis, in which High occurrence of tinea capitis in less than 10 years of age may be due to lack of fungistatic secretion by scalp in childhood (Weitzman and Summerbell, 1995). Adult sebum has fungustatic action. The low occurrence in females could be due to regular application of vegetable oil over the scalp which has fungistatic properties. In 2000, Fathi and Al-Samarai demonstrated that the prevalence rate of T. capitis was higher in children with a low socioeconomic profile (low standard of living, poor hygiene, low level of parental education and overcrowded living conditions) and the male to female ratio was 2:1.

MATERIAL AND METHODS

Population:
From June 2010 to April 2010, a total of 56 children from El-Sheikh Zaid dermatology center, Ismailia governorate, were involved in the study. The children were divided into two groups: 43 (82.7%) male, and 9 (17.3%) female.
Samples Collection:
The specimens were collected according to (Weitzman and Summerbell, 1995) as follows: lusterless, dull or short broken hairs from the scalp were plucked with non-toothed forceps after alcohol swapping for the infected area, epilating is better than cutting since the root contain high amount of spores. All the specimens were collected in clean sterile paper. The collected specimens were accompanied by questionnaire involving name of the patient, age, sex, occupation, address, date of sample collection, presence of the lesion in other body sites, duration of illness, previous exposure or contact with animals, similar infection in their family or friends in the school, history of and time elapsed from taking previous medications and presence of other diseases as diabetes or other medical problems.

Direct Microscopic Examination:
Direct microscopic examination was undertaken in 10% potassium hydroxide (KOH) wet mount for hair specimens. According to (Quinn et al., 1994), placing small pieces of the examined hair on a clean glass slide, covered with 1-2 drops of KOH 10% or 20% according to their thickness. The preparation was then covered with a cover slip that pressed down gently; additional drops of KOH solution were added from the side of the cover that spread under the cover by capillarity to replace air bubbles, and then sample was examined under the microscope.

Culture Study:
The culture was performed in two different sets of media; one sabouraud dextrose agar (SDA) with chloramphenicol 50 mg/L and cycloheximide 500 mg/L and the other was dermatophyte tested media (DTM). The culture tubes were incubated at 28°C and the culture growth was observed every two days and the tubes were discarded only after six weeks in the absence of growth.

The mycological identification was based on macroscopic and microscopic examination of the culture isolates. The macroscopic examination of isolated species was characterized by duration of growth, surface morphology and pigment production on the reverse, which Based on pigment production on the media (Emmons et al., 1977). The microscopic examination of fungal growth was observed with lactophenol cotton blue stain. Nature of mycelium and conidia formation (macro and micro conidia) helped to differentiate these species.

Biochemical Testing (Rice Grain Test):
According to (Fisher and Cook, 1998), sterile rice grain medium was used to distinguish \textit{M. audouinii} from \textit{M. canis}, where the \textit{M.canis} has the ability to produce yellow pigment on sterile Rice Grain medium, while \textit{M.audouinii} fails to produce this pigment and at best it produces a light brown discoloration of the rice.

RESULTS AND DISCUSSION
Prevalence:
Of the 56 children in the study, from ages 1 to 10 years, 52 dermatophyte positive cultures were obtained, indicating an overall prevalence of dermatophytes of 92.9%.

Etiologic Agent:
\textit{Trichophyton violaceum} and \textit{M. canis} were the most common agents in tinea capitis, being isolated in 21 (40.3%) and 16 (30.8%) cases, respectively. \textit{M. gypseum} was isolated from 9 children (17.3%), each of \textit{T. verrucosum} and \textit{M. audouinii} was isolated from 3 cases (5.8%). Dermatophytes isolated from collected samples were higher in male 43 (82.7%) than female 9 (17.3%). In fifty-two children with lesions, repeated culturing of the samples gave rise to the same dermatophyte as that in the initial sample.

Macroscopically and Microscopically Examination:
Discussion:
Although the prevalence of tinea has decreased in the middle-east countries, there is a marked difference depending on the region studied, along with the causative species. Thus, it is necessary to conduct geographically defined studies for the knowledge of the epidemiology of tinea capitis. The prevalence of tinea capitis (92.9%) is similar to that found in other studies carried out in Egypt, (El-Garf, 1979) where the prevalence was 88.4%, which is superior to results were reported in a study done by Fawzia in 1987, in which \textit{T. capitis} was the most prevalent form (51.1%). Males were predominantly affected with male to female ratio being 43: 14, which is comparable with other studies done by Hanaa in 1987, on \textit{T. capitis}. In which, Most of cases aged 3-9 years old and the infection was more common in boys (54%) than in girls (46%). These results were in agreement with those reported by (Kumar and Lakshmi, 1990) that \textit{T. capitis} was found to be more
Rice grain test

Rice grains with *M. canis* culture showing white cottony colony with yellow color.
common in males (58%) than in females (42%) and was more prevalent in children aged 6-12 years (44%). In contrary to those reported by (Ellabib et al., 2002) that positive majority of infections occurred in females and in children with ages less than 12 years (554/584, 94.86%). In 2001, Nermin performed a study on T. capitis, in which High occurrence of tinea capitis in less than 10 years of age may be due to lack of fungistatic secretion by scalp in childhood. Adult sebum has fungistatic action. The low occurrence in females could be due to regular application of vegetable oil over the scalp which has fungistatic properties. In a study by (Fathi and Al-Samarai, 2000), demonstrated that the prevalence rate of T. capitis was higher in children with a low socioeconomic profile (low standard of living, poor hygiene, low level of parental education and overcrowded living conditions) and the male to female ratio was 2:1. The etiology of tinea capitis shows a similar pattern to the one found in (Nasser, 1969) study, with two predominant agents: T. violaceum and M. canis with percentages of 52.6 and 24.5, respectively. Similar studies were done by (Mona, 1990; El-Garf, 1979; Abdel-Hafez et al., 1980). T. violaceum was the chief isolate form hair (21/52) in the present study, this similar to many other reports (Nasser, 1969; El-Garf, 1979; Abdel-Hafez et al., 1980; Fawzia, 1987; Ferial, 1987; Abdel-Hafez et al., 1990; Nermin, 2001; Maysa, 2002; Mohammed, 2004) and dissimilar to that reported by (Hanaa, 1987; El-Attar, 1992), in which, The most commonly isolated dermatophytes were M. canis with percentages of 38 and 70.6, respectively. No any uncommon species was isolated in this study, however all isolated species were previously isolated in a study done by (Hanaa, 1987), with exception for M. gypseum isolated in this study.

The high prevalence of tinea capitis in children should be considered by pediatricians for including this pathology in the differential diagnosis of dermatitis. It is important to promote preventive measures, thereby avoiding possible infections through interpersonal contact as well as using common sport spaces and schools. Guidelines aimed at preventing the spread of dermatophytes should be available in children places, especially, schools. This study provides remarks on the utility of educational health programs informing on the nature and ways of prevention of tinea capitis. It also stresses the importance of physical examination on the part of pediatricians to detect the infection at early stages.

REFERENCES


