Prevalence of Superficial Fungal Infection in Primary School Children in Ahvaz, Iran

Majid Zarrin¹, Maryam Poosashkan¹, Ali Zarei Mahmoudabadi¹, Mohamad Ali Mapar²

¹Department of Medical Parasitology and Mycology, Medical School, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran; ²Department of Dermatology, Emam Khomeini Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract

Background: Superficial fungal infections are common in schoolchildren. Superficial fungal diseases such as dermatophytosis and pityriasis versicolor, although not life-threatening, may be particularly distressing for this age group.

Objective: The objectives of this study were to determine the prevalence, clinical types, and causative agents of superficial fungal infections among primary school children in Ahvaz, Iran.

Methods: A total of 2827 randomly selected primary school pupils (aged 6-12) from 14 schools were examined for superficial fungal infections by direct microscopy and culture based laboratory diagnosed methods.

Results: Generally, 13 (0.4%) persons had infections. Out of these, 8 (61.5 %) were male while 5 (38.5%) were female. Seborrheic dermatitis (0.21%) was the most common infection, followed by pityriasis versicolor (0.18%) and tinea capitis (0.07%). The etiological agents of tinea capitis were identified Microsporum canis. Pityriasis versicolor was occurred only on the neck (100%). Seborrheic dermatitis was occurred among 9-to10-years-old pupils.

Conclusion: Our data provide a valuable baseline on which to assess future efforts directed toward the prevention of dermatophytes infections in our epidemiological.

Introduction

Superficial fungal infections are common in schoolchildren [1, 2]. Superficial fungal diseases such as dermatophytosis and pityriasis versicolor, although not life-threatening, may be particularly distressing for this age group.

Dermatophytes are fungi that have the ability to invade keratinized tissues such as the skin, hair and nail. Infections caused by these organisms are termed dermatophytosis [3].

These infections have now been recognized as a major public health problem worldwide [4]. Tinea capitis is common in children before and during puberty [5-9] and prevalence varies by geographic regions, seasonal conditions, and hygienic living conditions [10]. Therefore it is important to generate epidemiological data for different communities to enable strategic plan and control of possible eradication [2,11].

Tinea capitis occurs particularly in children, more frequent in males than female, and most common between 6 and 10 years of age. Large outbreaks usually
happen in schools or other places where children are congregate. It is generally a childhood disease and rare after puberty due to an increase in saturated lipid acids after puberty, which are fungicidal and fungistatic [1, 2].

Tinea capitis is caused by *Microsporum* or *Trichophyton* species. Frequency of the infection is associated to individual’s sex, age, personal hygiene and socioeconomic status. Mass screening is a helpful and most commonly applied manner in determining the accurate prevalence of dermatophytoses, particularly that of tinea capitis.

Pityriasis versicolor (PV) is a widespread infection of the skin caused by *Malassezia* yeasts. Although the infection is primarily seen in adults, children are most frequently affected in the tropics [12-14].

The objectives of this study were to determine the prevalence, clinical types, and causative agents of superficial fungal infections among primary school children in Ahvaz, Iran.

**Materials and Methods**

Fourteen primary schools from suburban areas in south Ahvaz were included in the study and a total of 2827 students were examined in spring 2008, comparing 1298 (45.9%) female and 1529 (54.08%) male students from 14 different primary schools.

Samples were collected from a total of 2827 pupils (aged between 6 and 12 years) in randomly selected primary schools in Ahvaz, Iran, in spring 2008.

Skin, head, toes and nails of randomly selected students were examined for symptoms of superficial fungal infections. Suspected body parts were cleaned with alcohol and scrapping made with scalpel was aseptically collected into sterile envelops which were labeled consequently and transferred to the laboratory for culturing.

Before the plating, a portion of the sample was mounted on a slide in a drop of 20% KOH and screened with a microscope for fungal structures. Another portion of the sample was plated on Sabouraud dextrose agar (SDA) and Sabouraud dextrose agar supplemented with 0.05 mg/ml chloramphenicol and0.5 mg/ml cyclohexmide. The cultures were kept at 28-30° C and examined after 28 days for the growth. Identification of the fungi was made according to their morphological and microscopic characteristics of growing colonies. Moreover mycological examinations were performed to confirm the diagnosis of pityriasis versicolor. Specimens were taken by means of scotchtape. Direct microscopy examination with methylene blue staining was carried out in the seborrheic dermatitis scales.

**Results**

During the period of study, of the 2827 primary school pupils sampled for clinical symptoms of the different type of superficial fungal infections, 13 (0.4%) persons had superficial mycoses. Of these, 61.5% (n=8) were male while 38.5% (n=5) were female. Seborrhoeic dermatitis [6 cases (0.21%)] was the most common infection, followed by pityriasis versicolor [5 cases(0.18%)] and tinea capitis [2 cases (0.07%)]. Two students who presented with kerion lesions were diagnosed ectothrix. Both students were male and 7 years old. The etiological agents of tinea capitis were identified *Microsporum canis*. Pityriasis versicolor was recorded only on the neck (5 cases). Pityriasis versicolor were observed among 8 to 10- years- old pupils. Infections were more frequent on male pupils than female (3 male, 2 female). Seborrhoeic dermatitis was occurred in male and female equally (Table 1). The infection was occurred among 9-to10-years-old pupils. The frequency on infection in relation to age of the pupils is presented in Table 1.

**Discussion**

The findings of this survey provide an insight into the pattern on infections among primary schoolchildren in Ahvaz, Iran. The study was performed in suburban area of the city.

Our study showed that, among the schoolchildren surveyed, seborrhoeic dermatitis (0.21%) was the most common form of infection, followed by pityriasis versicolor (0.18%) and tinea capitis (0.07%). This study showed that the prevalence rate of dermatophytosis in children in this area was 0.07%.
In this study, the prevalence rate of superficial fungal infections in children was 0.4%. The prevalence rate of infections among children in different parts of Iran varied from 1 to 2% [15-18]. In Kashan (central Iran), 1.36% of pupils in primary school had infections, [15] while the infection rate in Borojerd (western Iran) (16) and Chahbahrar (southeastern Iran) was 2% [17].

In the present study, *M. canis* was the only dermatophyte isolated. An epidemiological study of dermatophytosis in Varamin (a city in the south of Tehran), [19] Bandar-Abbas (south of Iran), [20] and Chahbahrar [17] demonstrated the *T. violaceum* was the most frequent dermatophyte among children. Omidynia et al showed that *Trichophyton* spp., including *T. verrucosum* and *T. schoenleinii*, were the main isolated dermatophytes among children in Hamadan (west of Iran) [21]. In Dezfol (southern Iran) *M. canis* was the most frequent dermatophyte among children [22]. Zoophilic species of dermatophytes such as *Microsorum canis*, *Trichophyton mentagrophytes* and *Trichophyton verrucosum* which afflict human being are especially associated with dermatophytosis in domestic and wild animals.

It is clear that the rate of superficial fungal infections in children in this study was lower than other Iranian reports. This might be because of the fact that in previous studies, the samples were a combination of rural and urban areas. Furthermore, different geographical regions could be another significant factor for this difference.

We observed 5 patients of pityriasis versicolor during the study. The most common age group involved was 8-10 years. Pityriasis versicolor involved only the neck (100%). The disease is most prevalent in early adulthood and small children are rarely affected [14]. Most of the patients in the study by Silva et al were in 11-15 year age group [12]. Ahvaz is situated in south-west of Iran which has high temperature and humid climate. These are two significant predisposing factors for pityriasis versicolor.

In our study, seborrheic dermatitis was occurred among 9-to-10-year-old pupils. Seborrheic dermatitis occurs in all races. The condition is slightly worse in males than in females. The usual onset occurs with puberty.

Although the pathogenesis of seborrheic dermatitis is not completely understood, correlation of seborrheic dermatitis lesions with proliferation of the genus *Malassezia* and clinical response of seborrheic derma-

**Acknowledgments**

This work was based on an MD thesis (Maryam Poosashkan) which was supported by Ahvaz Jundishapur University of Medical Sciences (Grant 85U092).

**References**


