International Scholars Journals

International Journal of Medical Sociology and Anthropology Vol. 9 (6), pp. 001-005, June, 2020. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research paper

Tinea capitis in primary school children in Hamedan (West of Iran)

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Accepted 16 November, 2019

Regarding the importance of tinea capitis as a world wide health problem, evaluation of this problem needs territorial epidemiologic studies. This disease is commonest in boys less than 15 years old, therefore this study was performed to determine the prevalence and aetiologic agents of tinea capitis among school children in Hamedan. We examined1800 cases of children from Hamedan primary schools. The cases were divided in three areas of according with economical, social and cultural level in: poor, medium and rich. In 44 cases suspected to have tinea capitis with were realized collection from lesion for mycological diagnosis. The causative agents were identfied macroscopically and microscopically after the clinical samples were subjected to potassium hydroxide examination and culture isolation. In 20 of these cases, the mycological exams demonstrate direct exam positive and 9 cases of them were culture positive. As a result, The incidence rate of tinea capitis among these cases were 1.11%, the highest rate (1.82%) in the poor area, the lowest rate (0.17%) in the rich area. The highest incidence rate of mycologically positive cases were in 7 year old children (25%). In the direct exam positive cases, 55% had Endothrix type and in the cultures, 44.45% was *Trichophyton verrucosum*, the most frequent isolate. Tinea capitis had the highest incidence rate in the poor areas. The incidence of tinea capitis in crowded families >5 is more than uncrowded families <5. The commonest type of lesion was gray patch (55%). Tinea capitis is still a public health problem in the world and any scalp lesion with itching and scaling should be considered as tinea capitis unless the opposite be proved through direct microscopy or culture tests.

Key words: Tinea capitis, epidemiology, primary school, Hamedan, Iran.

INTRODUCTION

In the history of medical sciences, dermatological diseases, because of being observable,have always received more attention (Rippon, 1988). Superficial fungal dermatophyte infections are considered important, because they consist of a high proportion of important dermalological diseases. Previous studies show that they cause 10 - 60% of dermatological diseases (Iirwin et al., 1999). Among the diseases caused by dematophytes, tinea capitis is the commonest fungal infection (Iirwin et al., 1999; Omidinia et al., 1996; Chadegani et al., 1987; Rastegar et al., 2005; Shochohe, 1985; Rafiei, 1965; Azizie, 1988; Shadeganipour et al., 1997) and the important point is that it is very common in children between the ages of 4 and 14 years old (Iirwin et al., 1999; Omidinia et al., 1996; Basiri and Khaksar, 2006). In one study tinea cruris was the most common type of superficial fungal infection in Iran (Aghamirian et al., 2007).

Regardless of great advances in preventing and treating the disease tinea capitis is still a public health problem in the world, especially in economically underdeveloped countries (Elewski, 1996; Enweani et al., 1996; Kemna and Elewski, 1996; Al Fouzan et al., 1993; Abdle and Nahata, 1997; Torres -Rodrigues and Balaguer-Meler, 1999; Patwardhan and Dave, 1999) and it is so important that in some studies it is concluded that any scalp lesion should be considered as tinea capitis, unless the opposite is proved through direct examination and culture tests (Deluol et al., 1985; Prevost, 1983).

Concerning the problems of treating tinea capitis, like mild forms of the disease, the symptomless vectors and the prolonged therapy with oral medicines, prevention and control of this fungal disease is quite urgent (Friden and Howard, 1994).

Because prevention and control of the disease requires comprehensive information about the epidemology of the

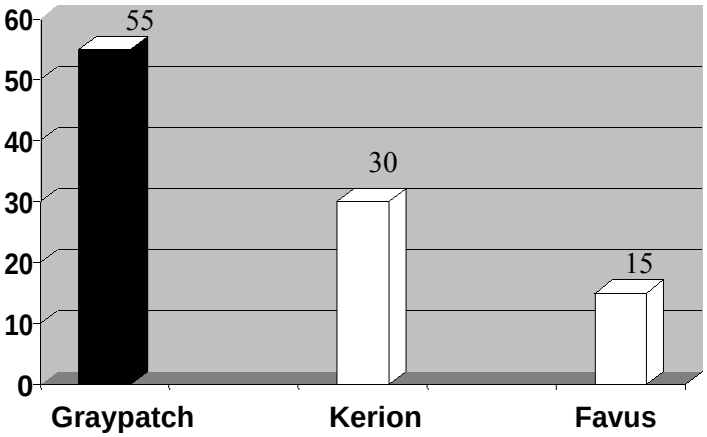

Figure 1. Type of lesions.

disease, and familial, social and geographical factors affect tinea capitis as well, performing an epidemologic investigation is of high importance (Friden and Howard, 1994).

PATIENTS AND METHODS

This research is done sectionally-descriptively, investigating the prevalence of tinea capitis among primary school boys in Hamedan.

Statistics in Hamedan and the model size formula are adjusted according to the previous statistics 3 - 5% (Hay et al., 1996; Malhotro et al., 1979; Nikpoor et al., 1979; Wiliams et al., 1995). The model size was estimated about 1800 persons, putting in the related formula. Sampling procedure has been done randomly.

On the basis of data issued by Program and Budget Department, the economic and cultural situations of different regions in Hamedan have been identified; Ostadan and Jahan Nama are rich areas, Sheshsad Dastgah is a medium one and khezr and Hesar are poor areas. 600 students from each area were examined clinically and some suspicious cases were referred to Farshchian hospital laboratory for furthur evaluations as direct examination and culture tests. Diagnosis of superficial fungal infection in this study was confirmed by direct microscopic examination of skin scales and several hairs was epilated for identification of macro and micro morphology of the colonies in the culture medium(mycosel agar) containing cyclohexamide, chloramphenicol and sabouraud agar.

To gather data and filling the check lists, the students were interviewed. The data were analysed, using spss software.

RESULTS

Of the 1800 cases being examined, 44 cases with clinically suspected tinea capitis were introduced for direct examination and culture tests. Among these, 20 cases were mycologically positive for dermatophytosis by direct microscopic examination and /or culture tests, and among these 9 cases were culture positive.

The study shows that the most mycologically positive cases are among 7 year old and then 8 year old students, respectively.

Among all the 20 mycologically positive cases 55% (11 cases) had gray patch, 30% (6 cases) had Kerion and 15% (3 cases) had favus type lesion (Figure 1).

This investigation shows that among 20 mycologically positive cases, 55% (11 cases) were endothrix and 25% (5 cases) were ectothrix and 5% (1 case) was Endothrix-Ectothrix and 15% (3cases) were favus . It shows that Endothrix is the commonest type among cases of positive smear (Figure 2).

The study shows that of 9 positive culture cases, 44.45% (4 cases) had *T. verrucosum*, 22.22% (2 cases) had *T. schoenleinii* and 22.22% (2 cases) had *T. Tonsurans* and 11.11% (1 case) had *T. Violaceum* (Figure 3).

This proves that among all positive culture cases, *T. verrucosum* had the highest incidence rate and *T. schoenleinii* and *T. tonsurans* had the equal incidence rate.

The most common associated symptom was itching 95.45% and then scaling 68.18% and hair loss 56.82% (Figure 4).

This study shows that in poor area with family members 4 the incidence rate of tinea capitis is 1.05%, in a family with 5 - 8 members 1.64%, and in a family with 9 - 12 members 3.95% ($p = 0.001$).

It is proved that there is a direct relation between tinea capitis and the number of the family members .

DISCUSSION

The results of this study show that the incidence of tinea capitis has been 1.11%. This data do not match with the Omidinia's study in Hamedan (Omidinia et al., 1996), in Liby's schools 4.49% (Malhotro et al., 1979), in London's schools 2/5% (Hay et al., 1996), in Philadelphia-American 3% (Wiliams et al., 1995), in Iraq's schools 2.7% (Fathi and Al-Samarai, 2000) and in Kerman's schools 0%

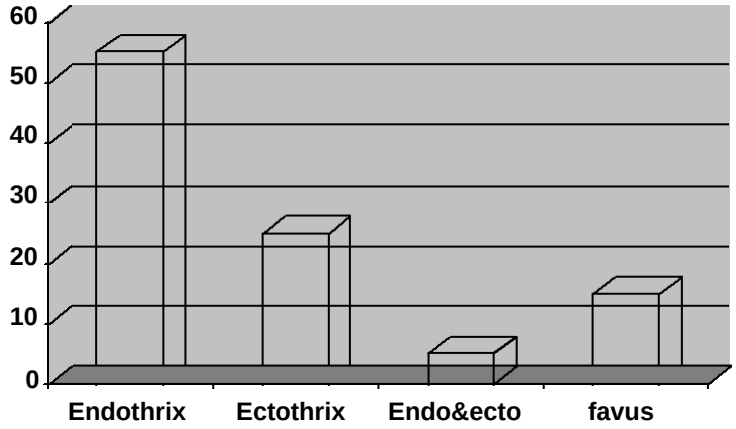

Figure 2. Type of smears.

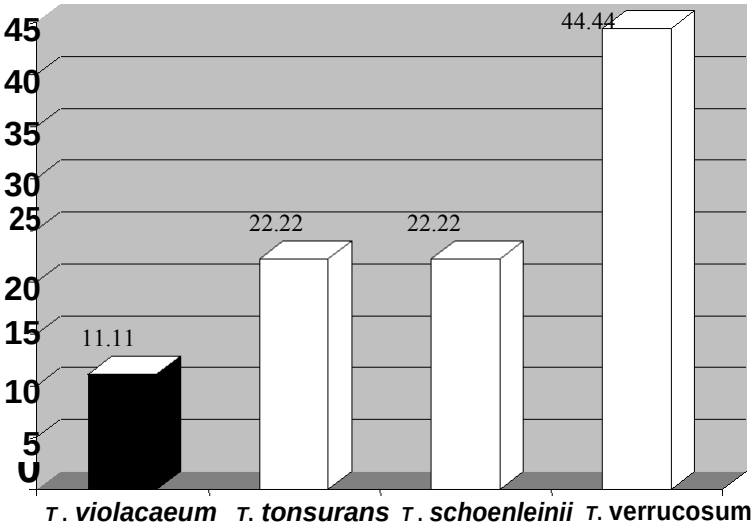

Figure 3. Isolated dermatophyte species.

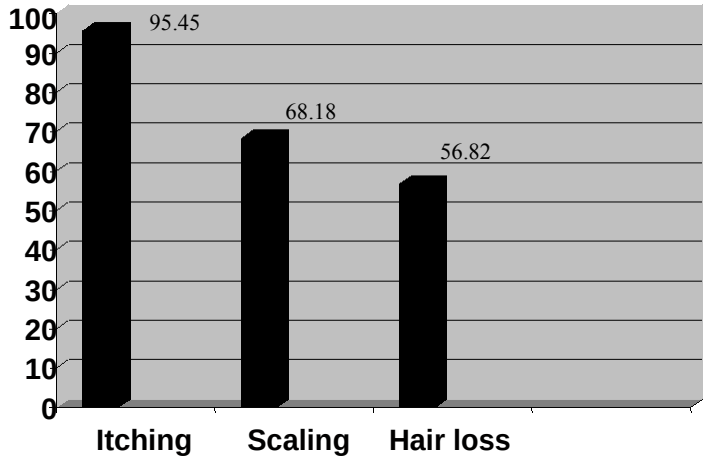

Figure 4. Associated symptoms.

(Ayatolahi et al., 1995).

Of course it should be noted that Omidinia's study (Omidinia et al., 1996) was done among rural students. In America the study was done among black students and in Iraq the study was done among both rural and urban school children (Fathi and Al-Samarai, 2000).

The study was done in London's nursery infant or junior schools (1057 children from 4 - 14 years of age) . The infection rate in different schools ranged from 0 - 12%, with a mean of 2.5% (Hay et al.,1996), but this difference in our schools was less, from 0.17 - 1.82%.

In this study, the incidence rate of tinea capitis in mycologically positive cases was 25% in 7 year old and 15% in 8 year old children. On the whole the highest incidence rate was among 7 year old children. This data are matched with other references (Iirwin et al., 1999; Rastegar et al., 2005; Deluol et al., 1985; Joseph, 1992; Simparva, 1989; Raste, 1965), with the study done in Serilanka (showing 85% of infection in patients under 15 years, 76% of infection in patients under10 years old) (Attapattu, 1989). The research was done in Saudi Arabia (showing 95% of infection in children under 15 years old) (Venugopal and Venugopal, 1993), and the study done in Tehran (showing more infection among 3 - 11 year old children) (Basiri and Khaksar, 2006).

Among 20 mycologically positive cases, 75% were in contact with livestock like sheep or cows. The results match with references (Iirwin et al., 1999; Chadegani et al., 1987; Shadeganipour et al., 1997; Deluol et al., 1985; Joseph, 1992; Venugopal and Venugopal, 1993) in which contact with livestoke has been considered as a mode of transmission. The results of culture show that animal strains are high, thus the possibility of contact with pets is notable, although none of the students reported such contacts.

In this study *T. verrucosum* was the most frequent dermatophyte causing tinea capitis. Studies performed in Shiraz (Dastghaib et al., 2005), Isfahan (Chadegani et al., 1987), Iraq (Fathi and Al-Samarai, 2000) and Hamedan (Yazdanfar, 1991) reported *T. verrucosum* as the commonest dermatophyte among children with tinea capitis as well. Omidinia et al. (1996) found that *T. schoenleinii* and *T. verrucosum* had been the most frequent dermatophyte causing tinea capitis in children from hamedan (Omidinia et al., 1996). Some Iranian studies showed that, in the South of Tehran, *T. violaceum* and *M. canis* (Rastegar et al., 2005); in Chahbahar (Southeastern Iran) and City of Varamin (south of Tehran) and in Tehran, *T. violaceum* (Basiri and Khaksar, 2006; Ghajari, 1986; Ansarin et al., 2001); in Ahwaz and Bandar-Abbas, *M. canis* - (Rafiei, 1965; Askari and Satari, 1973); and in Mahalat, *T. schoenleinii* (Asadi, 1990) were the most frequent isolated dermatophytes.

In other parts of the world the commonest dermatophytes are as follows: *M. canis* in Saudi Arabia (Venugopal and Venugopal, 1993); *M. audouinii* in Nigeria (Enweani et al., 1996); *T.tonsurans* in Southwest of London and in Philadelphia (Hay et al., 1996; Wiliams et al., 1995); *T. verrucosum* in Iraq (Fathi and Al-Samarai, 2000).

In the present research, the indivinduls were equally divided into 3 groups on the basis of their economical, social and cultural situations as: poor, medium, and rich areas.

The incidence rate of tinea capitis in poor area was 1.82%, in medium area 1.32% and in rich area 0.17% ($p = 0.018$).

The low cultural, economical and social levels have a direct relation with the frequency of tinea capitis. This result is confirmed by text books (Iirwin et al., 1999; Shadeganipour et al., 1997) and the studies done in Nigeria (Ajiao and Akintunde, 1985), Kuwait (Karavi et al., 1979), Iraq (Fathi and Al -Samarai, 2000) and Tehran (Basiri and Khaksar, 2006) as well.

In the present study, the frequency of tinea capitis was analysed comparing family sizes. The families were devided into 4 members, 5-8 members, 9 - 11 members.

In 4 member families, the incidence rate was 0.20%, in 5 - 8 member families 1.27%, and in 9 - 12 member families 3.1%. So, it is understood that the more the family members are: the higher the incidence of tinea capitis will be.

That is obviously in aggreement with the text books (Iirwin et al., 1999; Joseph, 1992) and also with the studies done in Nigeria (Ajiao and Akintunde, 1985), Iraq (Fathi and Al-Samarai, 2000) and Tehran (Basiri and Khaksar, 2006).

Conclusion

Tinea capitis is still a public health problem in the world and any scalp lesion with itching and scaling should be considered as tinea capitis unless the opposite be proved through direct examination or culture tests.

There is a direct relation between tinea capitis and number of the family Members. The low cultural, economical and social level have a direct relation with the frequency of tinea capitis. Contact with animals (like sheep, cows or pets) increase risk of tinea capitis.

Therefore to prevent and control the disease the above conditions must be considered .

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