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PREVALENCE OF *Tinea capitis* AMONG PRIMARY SCHOOL CHILDREN IN IGALA-MELA/ ODOLU L.G.A, KOGI STATE, NIGERIA

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ABSTRACT

A school survey of 1232 primary school children between the ages of 4-12 years was carried out in randomly selected schools in Igala-mela/Odolu L.G.A. of Kogi State for *Tinea capitis* infection. Cultural and Microscopic examinations of hair and scalp scrapings were carried out. A total of 602 (48.9%) had the infections, out of which 502 were males and 98 were females (ratio 5:1). Among the isolated dermatophytes, *Microsporum canis* was most predominant 287(47.7%), followed by *Trichophyton tonsurans* 140 (23.3%), *Trichophyton mentagrophytes* 112 (18.6%) while *Microsporum audouinii* was 63(10.4%). The high cases of the disease had a strong relationship with low standard of living, poor hygiene, overcrowding and proximity to domestic animals. Personal hygiene, proper sanitation and proper education on handling pet animals are strongly recommended.

Key word: Children, Epidemiology, Primary school, *Tinea capitis*,

INTRODUCTION

Tinea capitis is a superficial infection of the scalp that occurs mainly in children. The condition is characterized by patches of baldness, erythematous scaling, crusting and black dots produced by breakage of infected hair follicles (Fugueron and Fuller, 1996). The disease is caused by several species of the dermatophytes belonging to the genera *Trichophyton*, *Microsporum* and *Epidermophyton* (Fitzpatrick *et al.*, 1993). The frequent causes of *Tinea capitis* are *T. tonsurans*, *T. audouinii* and *M. canis*, through humans and animal contacts (Arnold *et al.*, 1990, Hughes *et al.*, 2011). *M. ferrugineum* and *M. gypseum* may occasionally cause ringworm of the scalp but the endothrix type such as *T. tonsurans* (black dot ring worm) and *T. violaceum* are most frequent invaders of the scalp and are beginning to replace *M. audouinii* epidemics of the 50's (Dagnew and Gunther, 1990, Arnold *et al.*, 1990). *T. tonsurans* regularly affects women adults because of their relationship with children. It has been discovered that 5% of apparently healthy children are carriers of dermatophytes in their scalp and the main species isolated was *T. mentagrophytes* (Al-Mosawi *et al.*, 1993; Binder *et al.*, 2011).

The ectothrix fungi found most frequently on the scalp and the main cause of Kerion is *T. verrucosum* and *T. mentagrophytes*. Infection with *T. schoenleinii*, a relatively common dermatophyte in the middle East, South Africa and Green Land (Yehia, 1980; Kolemen, 1981; Chadegani, 1998). Although the initial infection is probably nearly always contracted in childhood, it shows little tendency to clear up spontaneously at puberty and families with several generations affected are often found (Rahim, 1978). *T. capitis* however, is not a reported disease but is a cause for concern

because of its contagious nature. *T. capitis* is considered to be the most frequent cause of dermatophytosis in the republic of Iran and Jordan and the second most frequent cause of dermatophytosis in Mosul (Iraq) after *T. corporis* (Kolemen, 1981; Fathi and Al-Samarai, 2000).

Children are particularly susceptible to *T. capitis* especially school children of ages 4 to 14 years because of increased contact than in early childhood. The school surveys are good at measuring the magnitude of the problem. This study is aimed at determining the epidemiological level of the disease among children attending primary schools between ages 4 to 14 and the results will serve as a data base on prevalence of the disease.

MATERIALS AND METHODS

Study Area: Idah is located on the eastern part of the river Niger and bounded on the southern part of the Niger/Benue confluence. It lies on latitude 6° 43' north and longitude 60° 45' east. The town has two distinct seasons. The rainy season which last from April to September and the dry season which last from October to March. The annual rainfall range, From 140cm to 150cm a population of 79,815 (Yahaya *et al.*, 2009).

Sample collection: Specimens were collected randomly from 20 primary schools in Igala-mela/Odolu L.G.A. of Kogi State within two academic sessions. Field approach was adopted by visiting school, collecting samples and administering questionnaire forms to children and where respondent could not respond properly, they were followed home for parent's advice, and where questions were not understood properly by parents, they were interpreted in their local languages.

All respondents were either sufferers or had suffered the disease earlier. A total of 1232 scrapings were collected and analyzed in Department of Science Laboratory Technology, Federal Polytechnic, Idah. The affected areas were cleansed with 75% w/v ethanol with cotton wool and using sterile blades, scrapings of the scaling, crusting and the dull broken hairs from the margin of the lesions were collected in a sterile envelopes and carried to the Laboratory with 6 hours of collections for analysis.

Sample analysis: The various specimens were inoculated on sterile culture plates of Sabouraud Dextrose Agar (SDA) that were freshly prepared. The pH of the culture medium was adjusted to 5.6. and 3 drops of chloramphenicol and 1ml/L of Cycloheximide were added to suppress bacteria and fungi other than *Trichophyton* and *Microsporum* species. The plates were incubated for 3 weeks and the colonial and morphological appearance of the growth were identified according to the key provided by Collins and Lyne (1979). Test of independence using chi-square analysis and Fishers Exact test at 95% level of significance was used to test for

association of occurrence of the disease with other possible risk factors.

RESULTS

Out of the 1232 number of samples examined 602 (48.9%) were positive for the disease, and among these positive cases, *Microsporum canis* was the prominent species and was found to be 287 (47.7%) followed by *Trichophyton tonsurans* 140 (23.3%), *Trichophyton mentagrophytes* 112 (18.6%) and *Microsporum audouinii* 63 (10.4%) (Table 1). For the test of independence using the Chi-square contingency Analysis and Fishers Exact Test on the prevalence value, sex had significant influence on the disease incidence, there is higher positive cases in the males than the females (P<0.001). Age of children and the number of children did not show any significant influence on the disease prevalence (P>0.05). The results showed a strong association between the level of education of parents, working class parents and disease occurrence (P<0.001). There is no association between bed sharing and disease incidence (P>0.05), there was significant association between source of water, irregular bathing habit and the disease (P<0.001) (Table 2).

Table 1. isolated species of *Tinea capitis* and their prevalence rate in the study population.

Genera	No. of cases (%)
<i>Microsporum canis</i>	287 (47.7)
<i>Microsporum audouinii</i>	63 (10.4)
<i>Trichophyton tonsurans</i>	140 (23.3)
<i>Trichophyton Mentagrophyte</i>	112 (18.6)

Table 2. Distribution of the disease and common factors that could contribute to the spread *Tinea capitis* among the school children.

	Level of Infection		Towel share (%)		Comb share (%)	
	Female	Male (%)	No	Yes	No	Yes
+ve	98(7.96)	507(41.2)	168(13.6)	434(35.2)	196(15.9)	406(33.0)
-ve	448(36.4)	182(14.8)	252(20.5)	378(30.7)	98(8.0)	532(43.2)
Total	546(44.3)	686(55.7)	420(34.1)	812(65.9)	294(23.9)	938(76.1)
P values	P<0.001		P>0.05		P>0.05	
	Have Dogs/animals (%)		Educ. Parent (%)			
	No	Yes	No	Yes		
+ve	308(25)	294(28.9)	210(17.0)	392(31.8)		
-ve	371(30.1)	259(21.0)	56(4.5)	574(46.6)		
Total	679(55.1)	553(44.9)	266(21.6)	966(78.4)		
P values	P<0.05		P<0.001			

DISCUSSION

One of the greatest problems hindering the eradication and prevention of *Tinea capitis* is the presence of healthy, asymptomatic dermatophytes carriers. In this study the prevalence rate is higher (48.9%) compared to the results (9%) from 5 primary schools in Bengzazi, a rural Kuwait (Al-Mosawi *et al.*, 1993). Ajao and Akintunde (1985) found a prevalence rate for clinical infections among school children in Ile Ile to be 14.02% and in urban and rural school in and around Lusaka was 16.8% (Simpanya, 1989), and in Sarajevo it was 52.6% of the children that were infected (Prophic, 2008). The relatively high rate of the infection in the community surveyed could be attributed to lack of adequate information on the disease and the possible

misconception about the cause, low standard of living, overcrowding and poor hygiene as reason for the apparent increase in the spread of the disease. In this work, more males were infected (Table 1) the reason for this can be attributed to the easy implantation of the spores due of short hairs, frequency of sharing combs, brushes, caps and visits to village barbers whose unhygienic practices may lead to the transmission of infections from persons to persons. *Tinea* is a prepubertal disease and it was found that higher rate of infection is in children under 11 years of age. In previous reports, Yehia (1980), Raccurt *et al.*, (2009), Jankowska-Konsur *et al.*, (2009) higher prevalence of *Tinea capitis* in children between 8-12 years is 53.8%, 63.2%, 70% were recorded respectively.

London had a frequency of 71.3% of scalp infections in male and 28.7% in females with children in the majority, in Sarajevo the infection is more in male children less than 10 years of age (56.5%) (Prophic, 2008). The deficiency of sebum which acts as a fungistic factor will favor infection and the presence of dermatophytes on healthy skin may be due to commensalisms. Factors such as high blood sugar level and the presence of fatty acid in skin may determine the presence of these organisms and explain their gradual decline with advancing age (Clayton 1977; Martinez, 1980).

Contact with animals is considered a risk factor for *Tinea capitis* and 11% of the subjects have dogs and play with other domestic ruminant animals. In other related studies, 82.5% of positive cases in primary school children have high evidence of contact with cattle, sheep, chickens and stray dogs. Animal ring worm may be acquired both through direct contacts

with infected animals. Or indirectly through formites and a significant number of children with *Tinea capitis* are involved in the rearing of animals (Jones, 1995; Sahgal *et al.*, 1985, Raccur *et al.*, 2009, Jankowska-Konsur *et al.*, 2009).

T. capitis infection is also linked to overcrowding, the results of this work showed that most homes have an average of 4-5 children leading to frequent contacts between family members. Other factors like source of water, bathing habits, types of soap and cream and sharing of towels (general hygiene) had a strong association with the disease incidence in this study.

CONCLUSION

The magnitude of the disease among the tested age group is high and is becoming a re-emerging disease and efforts should be made towards eliminating the risk factors. Early detection and treatment of infected persons are strongly recommended.

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