TINEA CAPITIS INFECTION AMONG SCHOOL CHILDREN IN RURAL SETTING OF JOS NORTH-CENTRAL, NIGERIA

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ABSTRACT

Background:
Tinea capitis is a common infection of the scalp and hair shaft caused by dermatophytes. It is an infection associated with low socioeconomic status and poor personal hygiene.

Methods:
This was a cross sectional study involving pupils in two public schools in rural setting with clinical features suggestive of tinea capitis. Scrapings were collected from the scalp of the pupils between September 2018 and February 2019 and subjected to laboratory analysis of microscopy and culture. The data obtained was analyzed using SPSS version 20 statistical software.

Results:
A total of 67 pupils with clinical features of tinea capitis had positive cultures in the laboratory (21.5%), most of the pupils were of age range 4-8years (56.7%) and mainly males 167(52.2%). Factors associated with spread of tinea capitis were not statistically significant except for the sharing of towel($P<0.001$). Trichophyton mentagrophyte (40.3%) was the most isolated agent of tinea capitis followed by Microsporumgypseum (31.3%)

Conclusion:
Tinea capitis infection remains a problem associated with rural settlement and poor personal hygiene. A nationwide surveillance is required to prevent the spread.

Keywords: Tinea capitis, Trichophyton mentagrophyte, Dermatophytes, Microsporumgypseum.

INTRODUCTION:

Tinea capitis is a common infection of the scalp and hair shift caused by dermatophyte fungi[1]. It is most common in children particularly in developing countries but uncommon in adults.[2,3]

Several factors including gender, age, urban/rural environment, socio-economic status, certain cultural habit and poor personal hygiene have been documented to significantly impact the development of tinea capitis. [4,5]

The spread of tinea capitis infection is enhanced by poor personal hygiene, sharing of fomites (towels), and even over-crowding.[6,7]

Several studies carried out in different parts of Nigeria have shown that causative agents of tinea capitis vary from one location to another.[8,4,9] Trichophyton schoenlenii was reported as the predominant cause of tinea capitis in Borno state whereas Trichophyton mentagrophytes as the most prevalent in South –Western Nigeria.[2,9]Nweze and Okafor documented Trichophyton tonsurans as the leading cause agent of tinea capitis in Anambra State, Nigeria.[2,6]

There are several studies on the prevalence of tinea capitis in different parts of the country but studies on the current pattern of the agents of tinea capitis in Jos North Central Nigeria are needed to also obtain information on the epidemiology of the infection.[8, 2, 4] The purpose of the current study was to determine the prevalence of tinea capitis and

identify some associated factors among school children in Jos, North –Central Nigeria.

MATERIALS AND METHODS:

The study was carried out in two public primary school in rural settings in Jos, Nigeria, among children ages 4 – 13 years.

Pupils whose parents/guardians signed consent form were recruited in the study.

Each child's scalp was examined and sites of infection was cleaned with 70% alcohol and scrapings from actively growing margins of the lesions were obtained using sterile scalpel blades for each pupil by trained laboratory personnel. The samples were collected on clean sheets of paper and then transported to the laboratory for microscopy, culture and identification.[10, 11]

Microscopy:

Microscopic examination of the specimens was performed with 20% potassium hydroxide (KOH) at x400 magnification.

CULTURE:

The samples were cultured on sabouraud dextrose agar medium (SDA) (Oxoid) and SDA supplemented with chloramphenicol and cycloheximide (Oxoid) in tubes. The inoculated tubes (slants) were incubated at room temperature (25°c to 30°c) for up to four (4) weeks.[10]

Examination and identification of fungus:

The organisms were identified by their macroscopic features and microscopic features using lactophenol cotton blue.

RESULTS:

The total number of scrapping samples obtained from the head of the pupils with lesions suggestive of tinea capitis was 312. Of these, there were 67 positive cultures (21.5%) for tinea capitis. Of the 67 pupils with tinea capitis 56.7% were of age range 4 – 8 years compared with 43.3 % of age range 9 – 13 years (P =0.89). Males had more cultures of agents of tinea capitis 52.2% compared to females 47.8% (P=0.89). Considering the number of persons in a room in each household,

agents of tinea capitis were isolated from scrapings of pupils who slept in room with four or more persons (58.2%) (P= 0.52) Table 1.

The agents of tinea capitis isolated included, in order of frequency, Trichophyton mentagrophytes, Microsporum gypseum, Trichophyton tonsurans, Epidermophyton flocossum, Microsporum audouinii and Microsporum canis (Table 2).

TABLE1: Socio-demographic characteristics and Risk factors associated with occurrence of tinea capitis infection among school children in rural settings of Jos, North-central Nigeria

FACTORS	POSITIVE	NEGATIVE	P-VALUE
AGE GROUPS			
4-8	38	135	0.89
9-13	29	110	
GENDER			
FEMALE	32	113	0.89
MALE	35	132	
NO OF PERSONS PER ROOM			0.52
≤3	28	101	
≥4	39	144	
SHARING OF BED WITH OTHER PERSONS			0.58
YES	39	131	
NO	28	114	
SHARING OF COMBS	43	162	0.77
YES	24	83	
NO			
SHARING OF TOWELS	56	147	<0.001*
YES	11	98	
NO			

Statistically significant($p < 0.05$ set as minimum level of significance)

Table2: Dermatophytes isolated from tinea capitis infection among school children in rural setting of Jos, North-central Nigeria

FUNGI	FREQUENCY	PERCENT(%)
Trichophyton mentagrophyte	27	40.3
Microsporum gypseum	21	31.3
Trichophyton tonsurans	13	19.4
Epidermophyton flocossum	3	4.5
Microsporum audouinii	2	3.0
Microsporum canis	1	1.5
TOTAL	**67**	**100**

DISCUSSION:

Tinea capitis is prevalent among pre-pubertal children and tend to spread from person to person through direct contact and known to be endemic in Nigeria.[8]

The prevalence of tinea capitis (21.5%) in this study is lower than the prevalence of 45% and 43.5% obtained in other studies in Nigeria.[2,8]

However, the prevalence in this study is higher than that obtained in other studies in Nigeria.[6,4] Several factors may account for the varying prevalence of tinea capitis in different parts of Nigeria.[2,9] These include study population, nature of settlement, poor personal hygiene, close contact with infected children at school and as well as at home.

Considering the gender of the pupils recruited for the study, the isolation rate was higher among males compared to females but this was not statistically significant (P= 0.89). This is not in agreement with findings from other studies that showed higher isolation rate among females. [29],

A possible explanation for the result may be contamination of hair clippers leading to spread of agents of tinea capitis for male infection whereas steroid-mediated inhibition of fungal growth in females by progesterone have being suggested in some studies in which more of the agents were isolated from females.[8,6,12] The sharing of bed, combs and rooms with other persons were not significantly associated with isolation of agents of tinea capitis except the sharing of towel with other members of the house (P<0.001). The role of hair dressing, styling, shaving of scalp and use of different types of hair oils in disease transmission is still conflicting and remains for future study.[13,3,14]

Based on the isolation rate, Trichophyton mentagrophyte was the highest followed by Microsporumgypseum. This is not in agreement with findings from a few other studies in Nigeria in which Trichophyton rubrum was the highest causative agent isolated followed by Microsporum canis.[15,2,9] Another study reported Microsporum audouinii as the most isolated causative agent of tinea capitis followed by Microsporum ferrugineum.[8,6] The changing pattern in the aetiology of tinea capitis in the different studies in Nigeria and some other African countries may be due to movement of persons as a result of communal crisis, type of animal husbandry and even climate change.[16, 17, 13, 12, 18, 7]

CONCLUSION: Trichophyton mentagrophyte is a significant cause of tinea capitis. This study highlights the prevalence of tinea capitis in our environment and some factors associated with the spread. However, the establishment of a nationwide surveillance on tinea capitis is necessary to develop and evaluate preventive measures.

ACKNOWLEDGMENT

We are grateful to the pupils, their parents and the laboratory staff of the department of Medical Microbiology, Jos University Teaching Hospital for the assistance in the course of the study.

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