Dermatophyte Infections in Children: A Prospective Study from Port Harcourt, Nigeria.

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ABSTRACT

Background: Fungal infections constitute a major health problem all over the world including Nigeria. The aim of this study was to evaluate the spectrum of dermatophyte infections among children attending the Dermatological Clinic of the University of Port Harcourt Teaching Hospital (UPTH), Nigeria.

Methods

This was a prospective study of children with dermatophyte infection attending the Dermatological Clinic of the UPTH, Nigeria from January 2009 to December 2009. Diagnosis was made based on clinical features and confirmed by direct microscopy of the diseased tissue and culture of aetiological agent.

Results

A total of 432 children (whose ages ranged from 2 months to 16 years) were seen with skin diseases. Out of these, 49 had dermatophyte infection. Males 31(63.3%) were more affected than females 18(36.7%).Most 34(69.4%) of the children resided in urban slums with poor hygiene and social conditions. There was a predominance of tinea capitis 23(46.9 %). Trichophyton specie 28(57.1 %) and Epidermophyton specie 11 (22.4%) were most frequent causative fungi. Most children with dermatophytosis 41(83.7%) were below 10 years. Itchy rashes were the main presenting feature 31(63.3%).

Conclusion

The prevalence of dermatophyte infection among children in high. There is need for health education and public awareness campaigns among the communities in urban informal settlements on healthy seeking behaviors and hygiene in order to reduce transmission and severe clinical manifestations.

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INTRODUCTION

Dermatophytes are highly specialized group of fungi[1]. They affect the superficial keratinized tissue (skin, hair and nails) of man and animals[1]. Infection occurs primarily in prepubatal children over the age of 6 months[2]. It is highly contagious and represents a significant public health problem, particularly among school children[3]. Dermatophyte infections can be transmitted through body contacts (person to person transmission) mainly in schools or through inanimate objects like cloths combs or hair dressers equipment[1].

Socio-economic predisposing factors include; children's interaction patterns, poor living conditions marked by, poor sanitation, housing congestion, limited water supply as well as low economic power. Children living in informal settlements are more at risk to such skin diseases. [4]

Dermatophytosis inflicts a lot of psychosocial trauma due to attached social stigma, ulceration, and sometimes irritation which hampers pupil's concentration in class as well as representing a potential source of secondary bacterial infection[5]. It is not generally appreciated how disabling a skin disease may be a source of intense discomfort and stigma[5].

Dermatophyte infection in children has neither been the focus of intensive study nor of active control programmes in Nigeria. This has negatively affected development of adequate patient management, diagnosis, control programmes and antifungal drug resistance surveillance.

This study presents the spectrum of dermatophyte infections in children attending the Dermatological Clinic of UPTH, Nigeria.

MATERIALS AND METHODS

This was a prospective study of children with dermatophyte infections as seen in the Dermatological Clinic of UPTH from January 2009 to December 2010. The UPTH is located in Port Harcourt metropolis, the Capital city of Rivers State of Nigeria .All the patients were seen and examined by a dermatologist who confirmed all the diagnoses. The patients were referred from the Paediatrics and General Out Patient Clinics of UPTH. The dermatology clinic also receives referrals from all the medical facilities in state and the neighbouring states of Nigeria. All consecutive referrals were recruited into the study after informed consent from the care giver. A questionnaire was developed to record the socio-demographics, clinical and laboratory features of the patients and diagnosis. Diagnosis however was based on clinical and laboratory findings. Ethical approval was obtained from the Ethical Committee of UPTH.

Collection of samples

Samples of skin scrapings from the skin and nail were taken using a sterile scalpel. Scalpels were changed for each sample to avoid contamination of specimens. The scrapings were collected in a piece of sterile paper, carefully folded, and then placed in an envelope for storage in air-tight containers to await microscope and cultural analyses.

Sample Processing

Microscopy and culture of samples. A small sample of

each scraping was digested by placing it on a microscope slide and adding one to two drops of 20% Potassium hydroxide (KOH). A cover slip was applied and the slide was heated gently over a flame. Each treated slide was then carefully examined under low (x10) and High (x40) power objectives to observe the fungal forms.

Each scraping was cultured, for dermatophytes onto sabouraud dextrose chloramphenicol actidione agar. A duplicate inoculation of the sample was also cultured on sabouraud's dextrose cycloheximide agar. For non dermatophytes, cultures were made on sabouraud dextrose agar supplemented with chloramphenicol to eliminate bacteria. All cultures were incubated at 28oC for up to 4 weeks. Fungal isolates were then subcullttured onto plates of sabouraud's agar and potato glucose agar. The isolates were examined macroscopically and microscopically following staining with lactophenol cotton blue wet mount technique. The dermatophyte specie identificication was not done.
Data were analyzed by the Statistical Package for the Social Sciences (SPSS for windows version 15.0, SPSS Inc.). Descriptive statistics in the form of the frequency and percentage were calculated.

RESULTS

There were a total of 432 children with dermatological conditions seen in the UPTH over this period, out of which 49(aged 2 months to 16years) presented with dermatophyte infection giving a prevalence rate of 11.3%. Children below 10 years were affected in majority 41(83.7%) of cases (Table 1). Males 31(63.3%) were more affected than females 18(36.7%) giving a male/female ratio of 1.9:1(Table1).

Most 34(69.4%) of the patients resided with their parents in urban slums with poor hygiene and social conditions (Table 2). The mothers of the affected children were of the lower social class (79.6%) with poor educational background (Table 1).

Thirty one (63.3%) of the patients presented with itchy rashes. Other clinical features were: loss of hair 17(34.7%), infected rashes 11(22.4%), hypopigmentation 10 (20.4%), nail shortening 2(4.1%) and nail discolouration 2(4.1%).

The commonest site of dermatophyte infection was the scalp 23(46.9%) while the nail was the least (Table 4).Trichophyton specie 28(57.1 %) and Epidermophyton specie 11 (22.4%)

Table 1: Age and Gender Distribution of Children with Dermatophyte infection.

Characteristics	Frequency	Percentage
Age (years)		
<1	3	6.1
1-<5	20	40.8
5-<10	18	36.7
10-<15	6	12.2
>15	2	4.1
Gender		
M	31	63.3
F	18	36.7

Table 2:Socio-demographic Characteristics of Parents

Characteristics	Number	Percentage
Place of abode		
Rural	9	18.4
Urban slum	34	69.4
Urban	6	12.2
Social class		
Upper	2	4.1
Middle	8	16.3
Lower	39	79.6
Level of education		
None	5	10.2
Primary	16	32.7
Secondary	19	38.8
Tertiary	9	18.4

Table 3 Aetiological Agents Isolated from Nail and Skin Scrapping

Aetiological agents	Frequency	Percentage
Microsporum specie	8	16.3
Trichophyton specie	28	57.1
Epidermophyton	11	22.5
Mixed	2	4.1

Table 4: Distribution of dermatophytes according to sites

Specie	No. of patients	Scalp	Trunk	Groin	Feet	Finger nail	others
Trichophyton specie	28	16	3	3	3	1	2
Microsporum specie	8	3	1	1	1	-	2
Epidermophyton specie	11	3	5	-	-	-	3
Mixed	2	1	-	-	-	1	-

were the most frequent causative fungi (Table 3). However, specie identification was not done because of lack of technical support.

DISCUSSION

This study has shown that dermatophyte infections constitute 11.3% of all dermatological conditions in children in our facility. This is lower than the previous Nigerian studies, [4,6] but higher than that of Enemuor and Amedu, in northern, Nigeria. [7]

We found a higher prevalence in boys (63.3 %) than in girls (36.7%). This is similar to that reported by Ezeronye and colleagues which showed a higher prevalence in boys (73%) when compared to girls (27%). [8] This is at variance with reports [4,9] from other parts of Nigeria where females were more frequently infected than males. The higher prevalence of dermatophyte infection in boys may be attributable to the play-habits of boys which expose them more frequently to these pathogens. Also, the fact that boys visit barbers often can also contribute to this higher prevalence.

Most of the infected children were aged below ten years affirming the observation that dermatophyte infection is predominantly a pre-pubertal disease. This is confounded by poor hygiene at this age as well as the absence of saturated fatty acids that provide a natural protective mechanism against dermatophytoses. Children brought up in clean environments with less crowding and reliable water supply tend to suffer less from dermatophytes[10].

Tinea capitis was the most common type of dermatophytoses observed in our patients. This finding agrees with studies done in Africa, Europe, Asia[4,10,11]. This could be attributed to the exposed nature of the head/scalp compared to other body areas and hence ease of transmission and acquisition of infection. Sharing of hair care equipment, ignorance and poor hygienic practices of hair could be significant factors of contribution.

The genus trichophyton was the most significant isolate which agrees with other studies done in developing countries in African continent and parts of Asia[7,10,12].

It was observed that the living condition of the patients played a major role. Almost all the patients belonged to lower economic groups. The higher incidence of dermatophytoses could be attributed to environmental conditions such as hot temperature and humid weather characteristic of the geographical location in and around the study area. Poor personal hygiene and illiteracy are other major factors that influence dermatophytoses in this part of the country. Several earlier workers have reported similar
Findings[4,7].

In conclusion, the prevalence of dermatophyte infection among children is relatively high. Factors contributing to the high frequency and chronic occurrences in this area may include poverty, poor living environment and low level of maternal education. There is need for health education and public awareness campaigns among the communities in urban informal settlements on healthy seeking behaviors and hygiene in order to reduce transmission and severe clinical manifestations.

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