MPRI-JOMDR | INTERNATIONAL JOURNAL OF ORGANIC & MEDICINAL DEV. RESEARCH, VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3089

PREVALENCE OF SKIN DISORDERS DERMATOPHYTOSIS (RING WORM) INFECTION AMONG PRIMARY SCHOOL PUPILS IN AHIAZU MBAISE L.G.A. IMO STATE, NIGERIA

ONUOHA B.C.

Department of Animal & Environmental Biology, Imo State University, Owerri

Abstract

A study on the prevalence of ringworm infection among primary school pupils in Ahiazu Mbaise Local Government Area, Imo State, Nigeria was carried out between April and September, 2018 of the 120 Primary School Pupils randomly selected from three schools, overall prevalence of 33(27.5%) were recorded. In their age related prevalence, result revealed that age-group 8-10years had the highest prevalence (38.1%) and age group 5-7 years had (31.3%) infection. Infection decreased with increase in age. Sex-related prevalence was not statistically significant (P>0.05), as males 24(32.0%) are more prone to ringworm infection than females (9.1%). No Tinea Pedis, Tinea Barbae, Tineafaciei and Tinea capitis were found during the clinical survey. A wide clinical spectrum of infectious dermatoses was higherly prevalent among the surveyed population. Sex and age were significantly associated with specific clinical types, implementation strategies of school health programmes in similar rural communities should target these skin infections with due consideration of their specific sex and age correlates. Hence, dermatophytic infections are a public health problem among the school aged children studied.

Key word: Dermatophytosis; infection; primary school; Mbaise.

EDITOR-IN-CHIEF

Prof. A.S. Hossein [Saskatchewan]

INTERNATIONAL JOURNAL – OMDR
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3089

INTRODUCTION

Ringworm infection medically known as dematophytosis caused by dermatophytes which are high specialized group of fungi. They affect the superficial keratinzed tissue (skin, hair and nails) of man and animals. It is a common superficial fungal infection found throughout the world (Kern, 1999). It occurs primarily in prepubatal children over the age of 6 months (Ekeski and Hay, 1996). It is highly contagious and represents a significant public health problem, particularly among school children (Fathi and Al-Samarai, 2003; Ormer, 2003, Higgins et al 2003). Ringworm infection is not a reportable disease but is a cause for concern because of its contagions nature. It can be transmitted through body contact (person to person transmission) mainly in refugee schools or through inanimate objects like cloths, combs or hair dressers equipment.

Dermatophytes are a unique group of fungi that infect keratinous tissue of lower animals and humans (Weitzman and Summerbell, 1995). They are characterized by their ability to invade the superficial layers of the epidemis, particularly, the stratum corneum and the high keratin-concentration containing appendages, the hair and nails of the living host (Santos et al, 1997; Fernandes *et al*, 2001). Only under exceptional circumstances do they survive or proliferate in the deeper tissues of the body (Chastain et al, 2001). These fungi have worldwide distribution and at present, there are 40 recognized special in the dermatophyte genera (Aby, 1994). Of these, about 25 species belonging to the genera epidermophyton, microsporum and trichophyton are presently known to infect man (Weitzman and Summerbell, 1995). Dermatophytosis can be unsightly or diafiguring causing varing symptoms depending on the part of the human skin they are found. For instance, ringworm of the skin (*Tinae corporis*) causes annular lesions with a clearing, scaly center surrounded by a red advancing border that may be dry or vesicular. Ringworm of the scalp, (Tinaecapitis) also gives rise to dull gray. Circular patches of alopecia, scaling, itching and black dot. Though other ringworm species abound, the present work is restricted to Tinea

EDITOR-IN-CHIEF
Prof. A.S. Hossein [Saskatchewan]

capitis and Tinea corporis for instance, ringworm of the skin (Tinea corporis) causes annular lesions with a clearing, scaly cover surrounded by a red advancing border that may be dry or vesicular. Ringworm of the scalf, (Tinae capitis) also gives rise to dull gray, circular patches of alopecia, scaling, itching and black dot (Jawetz et al, 1998).

Dermatophytic infections have been known to impact negatively on health and well being of children. The aim of this present study is to determine the prevalence, as well as atiologic organisms of dermatophyte infection among primary school children aged or 14 years in Ahiazu Mbaise Local Government Area of Imo State, Nigeria.

Study Areas

This study was carried out in Ahiazu Mbaise Local Government Area of Imo State, Nigeria between April and September 2018. The geographical coordinates are latitude 5.100-55N and longitude 6.35E-28E. It has an area of 198km and a population of 200,000. The climate of the area is tropical and vegetation characteristics are tropical rainforest. It experiences a moderate rainfall of 1500mm and average minimum temperature of 20^{0}C. it also experiences two varying seasons of wet and dry season with an intermediate harmattan period within the months of December and January. The wet season is usually between April and October, while the dry season is from November to March. They major occupation of the people also embraced small scale trading and hunting. Garri remain the major staple food for the people, they produce good quantity such as oil, kernel, broom (local ones) and baskets. The people of Ahiazu are Igbos and share similar social cultural characteristics with most Igbo communities in Nigeria. Their major economic activity includes; farming, trading, food processing, craft making and hunting.

Study Population

This study was a cross sectional survey, involving all children aged 5-14 years in each of the three public primary schools in Ahiazu Mbaise Local

INTERNATIONAL JOURNAL – OMDR
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3089

Government Area. The study made of one hundred and twenty (120) children which comprised of forty (40) children from each of the selected schools through random sampling technique.

Ethical Consideration

This study was approved by the Board of the Department of Animal and Environmental Biology. The need and importance of the study was also high lighted to the officers. The head of the primary schools were informed on the work schedule. The pupils were given health education on the disease. All areas of each pupils head scalp, hands, legs and other part of the skin were thoroughly examined for evidence of scaling, crusting, follicular inflammation and hair loss of erythema.

In each clinically diagnosed case of Tinea capitis and Tinea Corporis, a detailed history was recorded. Information was noted on the disease duration, socio-economic status and the level of crowding at home. Pupils were asked about their bathing habits (the number of times the bath in a day, use of soap and sharing of towels with their relation or friends). They were also asked about their habits of sharing clothes, caps or hats at home and in school and the existence of portentially contagious contacts, including contact with animals. Family history and personal hygiene were also taken into consideration.

Data Collection

Structured questionnaire was administered to clinically suspected dermatophyte infected pupils by interview. The diagnostic criteria utilized include: Annular lesion worth activity at the edges and central clearing on the skin of any part of the body; scaling patches on the scalp with or without hair loss or erythema; anycholysis (nail plate separation from nail bed), thickened, discolored (white, yellow, brown, blue), broken and dystrophic nails. All absenting primary school pupils aged 5-14 years in the three selected schools whose parents have given a written consent for their inclusion in the study were included while pupils who are outside the age

group 5-14 and without any skin lesion or with skin lesion but did not meet the clinical suspected diagnostic criteria of dermatophyte infection were excluded. In addition, pupils who met the clinical suspected diagnostic criteria of dermatophyte infection but are on antifungal treatment (oral or topical), orthodox or traditional, 2 weeks to the period of study where also excluded.

Those with lesions compatible with dermatophytis had samples taken from the affected parts after parental consent and pupil verbal assent. Skin lesions are sampled from the erythematous, peripheral, actively growing margins of the lesions. In hair samples, the dull, lusterless hair and stubs of hairs are chosen and plucked by sterile epilator forceps, while nail samples are taken from deeper part of the discolored or dystrophic parts of the nails. A portion of the obtained sample was placed on clean blotting paper for microscopy and another portion inoculated directly on sabour and dextrose agar (SDA) start with chloramphenicol for mycological examination. This was immediately transported to the departmental laboratory in a black polythene bag were those collected for microscopy was subjected to 10% Koh and those inoculated on SDA agar were incubated at room temperature till the second day where it was transported to the microbiology laboratory of Imo State University; were it was incubated at room temperature and at 37^0C for minimum period of 3 weeks. Further sub culture was done on plain SDA after the growth of the dermatophtes was established. Positive cultures were examined macroscopically and microspically for species identification on the basis of cultural characteristics, pigment production, microspic examination in lactophenol cotton blue preparation, and hair penetration test whenever necessary.

Sample Examination

In all suspected cases of Tinea capitis and Tinea Corporis, the diseased areas of the skin or head were thoroughly cleaned with alcohol and hairs and scales were collected for mycological examination using the most appropriate technique used by Fathi el al (2000). Hairs from the diseased

INTERNATIONAL JOURNAL – OMDR
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3089

areas were examined wih the aid of woods light for positive examination, which were confirmed with the presence of green fluorescence (Ogbonna et al 1992). Such Fluorescing hairs were then taken. Where negative results were obtained with Wood's light, dull gray hairs were collected with sterilized containers. The scrapings were handled separately and no individual scraping was allowed to mix up with the other. Both net and slide culture techniques were carried out as described by Omar (2003).

Data Analysis

The data obtained were subjected to statistical analysis using simple percentage and simple frequency table.

Results

From the demographical distribution (Table1), it was observed that more males 75 (62.5%) participated in the study than females 45 (37.5%). In the age relation, age group 8-10 years 42(35.0%) participated more in the study, followed by 11-13 years 34 (28.3%), 14 and above 28 (23.3%) and the least age participated were 5-7 years 16 (13.3%). Those whose parents were farmers and the trader's recorded 46 (38.3%) and 42 (35.0%) respectively, while civil servant and artisans had 21 (17.5%) and 16 (13.3%) participants. Those from class 3-4 participated more with average frequency and percentage of 60 (50.0%), followed by class 5-6 with 40 (33.3%) and class 1-2 recorded the least participants 20 (16.7%).

Table 1: Demographical Distribution of Children

Variables	Frequency N=120	Percentage %
Sex		
Male	75	62.5
Female	45	37.5
Age (in years)		
5-7	16	13.3
8-10	42	35.0

INTERNATIONAL JOURNAL – OMDR
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3089

Variables	Frequency N=120	Percentage %
11-13	34	28.3
14 and above	28	23.3
Parental Occupation		
Farmers	46	38.3
Civil Servants	21	17.5
Traders	42	35.0
Artisan	16	13.3
Class-relation		
1-2	20	16.7
3-4	60	50.0
5-6	40	33.3

Table 2: Shows the over prevalence of ringworm infection 33 (27.5%) among the examined school children. It was found that ringworm infection was more in Community Primary School, Umuokirika with frequency and percentage record of 18(45.0%), followed by Central School Umuokirika 16(40.0%) and Town Primary School Umuokirika 9(22.5%) had the least infection.

Table 2: Overall prevalence of ringworm infection among primary school children.

Schools	No Exam	Infected (%)	Uninfected (%)
Community Primary School Umuokirika	40	18(45.0)	22(55.0)
Central School Umuokirika	40	16(40.0)	24(60.0)
Town Primary School Umuokirika	40	9(22.5)	31(77.5)
Total	120	33(27.5)	87(72.5)

Table 3 shows that age related prevalence, result revealed that age group 8-10 years (38.1%) had the highest ringworm infection, followed by age

EDITOR-IN-CHIEF
Prof. A.S. Hossein [Saskatchewan]

INTERNATIONAL JOURNAL – OMDR
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3089

group 5-7 years and >14 recorded (17.6%) and (14.3%). There was no significant difference between the age group (p>0.05).

Table 3: Age related prevalence of ringworm infection

Age-relation	No Examined	No Infected (%)	No Uninfected (%)
5-7	16	5(31.3)	11(68.7)
8-10	42	16(38.1)	26(61.9)
11-13	34	6(17.6)	28(82.4)
14 and above	28	4(14.3)	24(85.7)
Total	120	33(27.5)	87(72.5)

Table 4 In relation to sex prevalence, result shows that males recorded 24(32.0%) against their female counter parts that recorded 9(20.0%).

Table 4: Sex-relation Prevalence of Ringworm Infection

Sex relation	No Examined	No Infected (%)	No Uninfected (%)
Male	75	24(32.0)	51(68.0)
Female	45	9(20.0)	36(80.0)
Total	120	33(27.5)	87(72.5)

Table 5 Various clinical types of *Dermatophytoses Tinea Corporis* (45.5%) was the most common clinical patter observed followed by *Tinea Cruris* (24.2%), *Tinea Unguium* (18.2%), *Tinea Manuum* (9.1%). No cases of *Tinea Pedis, Tinea barbae, Tinea faciei* and *Tinea Capitis* were seen in either sex. Various types of coexisting forms of dermatophytic infections were also encountered.

Table 5: Various Clinical types of Dermatophytoses with Percentage

Species	Frequency N=33	Percentage (%)
Tinea Corporis	15	45.5
Tinea Cruris	8	24.2
Tinea Pedis	0	0.00
Tinea Manuum	3	9.1

EDITOR-IN-CHIEF
Prof. A.S. Hossein [Saskatchewan]

Species	Frequency N=33	Percentage (%)
Tinea Unguium	6	18.2
Tinea barbae	0	0.00
Tinea Faciei	0	0.00
Tinea Capitis	0	0.00

Dermatophytosis (Ringworm) infections on different part of Human Body

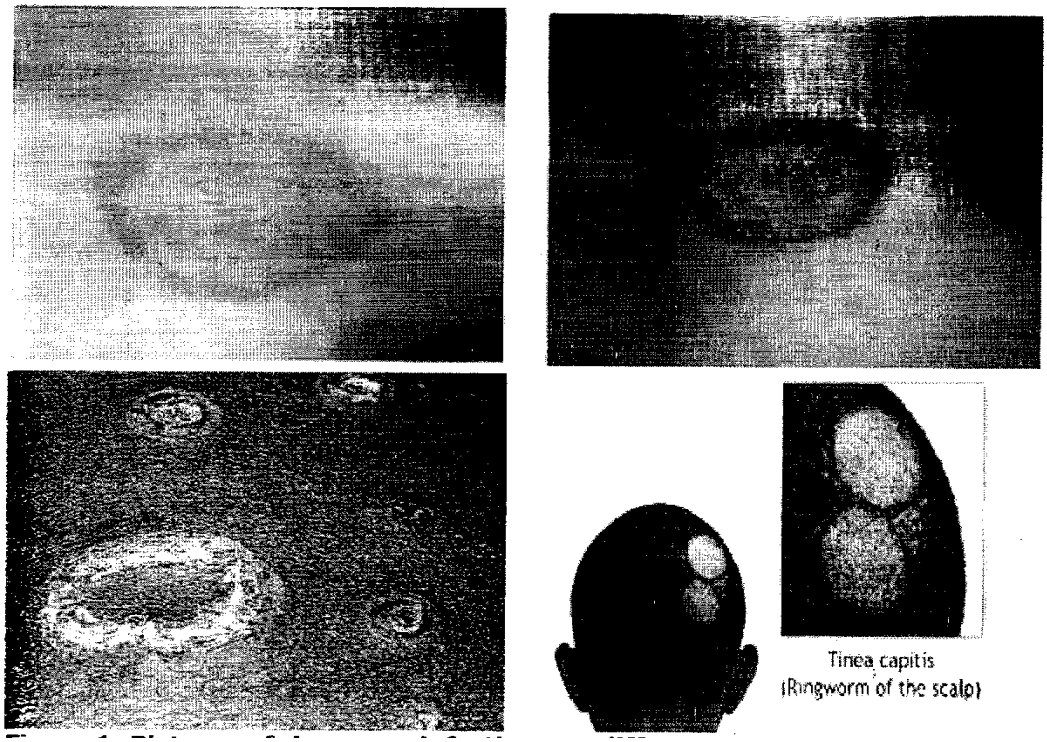


Figure 1: Pictures of ringworm infection on different part of human body

Discussion

Dermatophytic infection is a common infection that constitutes public health problem among children worldwide, including Nigeria. In the present study of the 120 children were surveyed from 3 (three) public schools in Ahiazu Local Government Area of Imo State. The schools were randomly selected. The prevalence rate of culture proven ringworm (dermatophytic) infection was (27.5%). This finding was relatively high, compared to earlier local surveys among school children in Nigeria with rates between 7% and

15% (Ajao and Akintunde, 1995, Nweze, 2002; Oguobiyi et al, 2005; Adefemi, 2008). The high prevalence of dermatophytes, in this study was actually expected because of the back drop that almost all parameters known to favour person to person transmission, such as the presence of previous skin lesions, overcrowding in the home, practice of sharing personal belonging, practice of keeping pets and factors that suggests poor personal hygiene are present in the pupils surveyed (Adefemi, 2008). This might not be unconnected with the local environmental and climatic conditions of the area studied, which probably favours the growth of other fungi over and above dermatophytes (Anosike et al, 2005). Persons with asymptomatic carrier status of dermatophytic infection have been reported in literature to be both the reservoirs of infection in the community and constitute almost similar prevalence to symptomatic cases.

The present study was in contrast with the studies among school children in Palestine which reported (1%) prevalence (Alishtayel *et al*, 2002), and in Iraq (2.7%) prevalence (Fathi Alisamari, 2000). The lower prevalence in those studies was attributed to routine practice of strict inspection of children by teachers who in turn prevent infected children from attending school until treated and cured, rather than improvement in hygiene standard. Moreover, it was recorded in this study that males participated more than females. As a result it was revealed that out of 75 males examined, (32.0%) had ringworm infection, against their female counterparts that recorded (20.0%). The higher incidence in males could be due to greater physical activity and increased sweating. Gender related studies on the prevalence of ringworm in Nigeria have been fragmentary (Ogbonna *et al*, 1996). Here, more females than males were infected though this was not statistically significant.

This finding suggest that that infection is related to personal hygiene and its prevalence can be reduced by adequate health education and good personal hygiene practices. Higher prevalence of infection was found amongst children under the age of 10 years than older ones, suggesting that ringworm is mainly a pre-pubated disease. This can be explained by proper

hygiene at this age as well as the absence of saturated fatty acids that provide a natural protective mechanism (Fisheer and Cook, 1998). In their age relation, result revealed that age group 8-10 years (38.1%) had the highest dermatophytic infections (ringworm infection), followed by age group 5-7 years (31.3%), age group 11-13 years and > 14 recorded (17.6%) and (14.3%). There was no significant difference between the age groups (P>0.05). furthermore, findings of the various clinical types of dermatophyteses shows that *Tinea Corporis* (45.5% was the most common clinical pattern observed followed by *Tinea Cruris* (24.2%), Tinea unguium (18.2%), *Tinea manuum* (9.1%). No cases of *Tinea pedis, tinea barbae, Tinea faciei* and *Tinea capitis* were seen in either sex. Various types of co-existing forms of dermatophytic infections were also encountered. This is in accordance with the Bindu et al (2002) study and other studies, which have also stated that *tinea corporis* and tinea cruris are the most common clinical type of dermatophytic infections.

In the studies by Sardari *et al*, (1993) and Verma *et al*, (2000) it has been reported that *tinea cruris* was the most common clinical type. However, in our study *tinea corporis* was common in comparison with *tinea cruris*. In another clinicomycological study of superficial mycosis in a hospital in north East India, it was observed that *tinea pedis* (29.2%) as the most common dermatophysis followed by *tinea cruris* (26.2%), which differs from other studies.

Conclusion and Recommendation

The prevalence of culture confirmed dermatophytic infections in the age group 5-14 years. A wide spectrum of infectious dermatoses was highly prevalent among the surveyed population. Secondly age were significantly associated with specific clinical types. Present clinicomycological study showed *tinea corporis* as the most common clinical pattern followed by *tinea cruris*. In recommendation therefore, implementation strategies of school health programmes in similar rural communities should target these skin infections with due consideration of their specific sex and age

correlates. Hence, dermatophytic infections are a public health problem among the school age children studied.

REFERENCES

Adefemi, S.A. (2008): Study of dermatophytic skin infection among primary school in Oke-Oyi. A dissertation submitted to West African College of Physicians in partial fulfillment of the requirements for the award of fellowship of the college in family medicine.

Ajao, A.O. and Akintunde, C. (1995). Studied on the prevalence of Tinea capitis infection in Ile-Ife, Nigeria, mycopathologia, 89(1): 42-48.

Ali-Shlayel, M.S., Salameh, A.A. and Khraim, H. (2002). Prevalence of Tinea capitis as well as of asymptomatic carriers in school children in Nablus area Palestine. Mycoses 45: 5-6.

Aby, R. (1994). Ecology and Epidemiology of dermatophytic Int., Dermatol.infections.j.em.Acad.Dermatol, 31:52 1-5.

Anosike, J.C., Keke, I.R., Uwaezueoke, J.C., Anozie and Nwoke, B.E.B. (2005). Prevalence and distribution of ringworm infections in primary school children in part of eastern Nigeria. J. Appl. 9:21-5.

Bindu, V. and Pavithran, K. (2002). Chnicomycological study of dermatophytosis in calicut. Indian J. Dermato Veneral leprol, 68: 259-61.

Chastain, M.A., Reed, R.J. and Parka, G.A. (2001). Deep dermatophytosis: Report of 2 cases and review of the literature. Cutis, 67: 457-62.

Ekeski, T.U. and Hay, H.G. (1996). Etielogy of dermatophytosis in Eastern Nigeria mykosen, 25: 178-181.

Enweani, I.B., Ozan, C.C., Agbenlahor, E.E. and Ndip, R.N. (1996). Dermatophytosis in school children in Ekpoma, Nigeria. Mycoses 39: 303-5.

Fathi, H.I. and Al-Samarai, A.G.M. (2000). Prevalence of Tinea capitis among school children in Iraq. East Mediterr Health J. 6:128-137.

Fernandes, N.C., Akiti, T. and Barrieiros, M.G. (2001). Dermatophyoses in children: Study of 137 cases revista do instituto de Medicina Tropical de Sao, 43:83-5.

Fisher, F. and Cook, N.B. (1998). Fundamentals of diagnostic mycology. Philadelphia, WB Sanders Company, 118-156.

Higgins, E.M., Fuller, L.C. and Smith, C.H. (2003). Tinea capitis Guidelines for the management of Tinea capitis. Dermato, 6, 1-5.

Kern, M.E. (1999). Medical mycology. Philadelphia E.A. Davis company pp.44-62.

Nwaeze, E.I. (2002). Etiology of dermatophytoses amongst children in northeastern Nigeria. Med. Mycol, 39:181-4.

Ogbonna, C.I.C., Robinson, R.O. and Abubakar, J.M. (1996). The distribution of ringworm infections among primary school children in Jos, Plateau State of Nigeria. Myco 59:101-106.

Ormer, C.M. (2003). Geogrphical distribution of the dematophtes. A review J. Hug, London 80:301-313.

Omar, A.A. (2000). Ringworm of the scalp in primary school children in Alexandia: infection and carriage. Eastern Mediterranean health journal, 6(5): 961-967.

Santos, J.I. Negri, C.M. and Coeiho, M.P. (1997). Some aspects of dermatophytoses seen at university hospital in florianopolis, Santa Cartarina, Brazil. Myco. 39:137-40.

Sardari, L. Sambhasliva, R.R. and Dandapani, C. (1993). Clinico mycological study of dermatophytes in a coastal area. Indian dermatol venercol lepnol 49: 2:71-5.

Weitzman, I. and Summerbell, R.C. (1995). The dermatophytes clin microbial Rev., 8:240-59

EDITOR-IN-CHIEF
Prof. A.S. Hossein [Saskatchewan]