

Hospital-Based Prevalence of Dermatophytes and Other Skin Infections among Children in Imo State, Nigeria: A Ten-Year Retrospective Study

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ABSTRACT

Skin infections in childhood continue to be a major cause of morbidity in tropical and resource-poor environments. Dermatophyte diseases, particularly tinea capitis and other superficial mycoses, are easily transmitted among youngsters by intimate contact, sharing personal things, household crowding and conducive environmental factors. Despite their clinical and public health importance, long-term hospital-based data on childhood dermatophytes and other skin infections are scarce in Southeast Nigeria. Ten years of study was conducted to determine the hospital-based prevalence of dermatophytes and other reported skin illnesses among children attending selected tertiary health institutions in Imo State, Nigeria. A retrospective cross-sectional evaluation of paediatric hospital records was undertaken in three designated referral institutions in Imo State. We reviewed the records of children 0–15 years old who attended the participating institutions from January 2015 to December 2024. Eligible individuals had a documented diagnosis of a dermatophyte, bacterial, viral or parasitic skin infection. The hospital-based period prevalence was computed with the total number of paediatric attendance records during the study period as denominator. Prevalence estimates were reported with 95% Wilson confidence intervals. A total of 17,200 paediatric attendance records were analysed, 391 of which had a proven skin infection. The overall hospital-based period prevalence of recorded skin infections was 2.27% (95% CI: 2.06%–2.51%), or approximately 22.7 cases per 1,000 paediatric attendees or 1 case per 44 paediatric attendees. The results suggest that dermatophytes and other infectious skin diseases represented a consistent clinical burden among children presenting for care at tertiary health institutions in Imo State over the 10-year study period. Childhood dermatophytes and other skin infections represent a clinically significant component of paediatric morbidity in tertiary healthcare settings in Imo State. However, the prevalence observed relates to reported instances in children who attended hospital treatment and should not be used as a measure of population prevalence. The reduction of skin infections of childhood may be achieved by strengthening the routine dermatological monitoring; improvement of early diagnosis and appropriate treatment; promotion of the personal and environmental cleanliness; and by implementation of school- and community-based skin-health education. Prospective and community-based studies are necessary to establish the true incidence in the population and to identify specific risk factors for dermatophyte and other skin infections among children in Imo State.

Keywords: children; dermatophytes, hospital prevalence, Nigeria, paediatric dermatoses, skin diseases, tinea.

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INTRODUCTION

Skin infections are an important but often under-recognised cause of morbidity among children worldwide, especially in tropical and subtropical regions where climatic, socioeconomic, environmental and behavioural conditions may favour the transmission and persistence of infectious agents. Skin infections in childhood include a heterogeneous group of disorders caused by fungus, bacteria, viruses and parasites and may involve the skin, scalp, hair and nails. Although most are not immediately life threatening, they can cause substantial discomfort, pruritus, inflammation, deformity, sleep difficulty, school absence, psychological distress and diminished quality of life. Delayed diagnosis and incorrect treatment in resource constrained situations may further prolong infection and

facilitate transmission within households, schools and communities [1].

Dermatophytes are a genus of keratinophilic fungi that use keratinised tissues of skin, hair and nails, and are among the primary causes of paediatric skin infection. Dermatophytes are generally categorised under the genera *Trichophyton*, *Microsporum* and *Epidermophyton*. In youngsters, infections might manifest as tinea capitis, tinea corporis, tinea faciei, tinea cruris or other forms of superficial dermatophytosis. Tinea capitis is particularly significant in school-aged children, as infection of the scalp and hair can be quickly disseminated through direct touch and sharing of combs, brushes, caps, towels, beds, and other personal items. Household crowding, poor personal cleanliness, lack of access to healthcare and close interaction among children

in schools and other community contexts may enhance transmission [2]. Dermatophyte infections show a wide variation in their epidemiology according to geographical region, age, socio-economic situations, climate, population density, cultural behaviours and the diagnostic procedures used. Superficial fungal infections are especially relevant in tropical areas where warm temperatures and high relative humidity encourage fungal development and transmission [3]. Other variables that may enhance the vulnerability of children in many African communities are overcrowded housing, inadequate water and sanitation facilities, shared grooming tools, low health education and limited access to diagnostic services. Such determinants may act in concert to perpetuate transmission and lead to recurrent infections [4]. Childhood skin infections have clinical implications beyond the lesions themselves. Chronic infections of the scalp such as tinea capitis can result in scaling, alopecia, pruritus, an inflammatory reaction, and in severe cases irreversible scarring and hair loss. Other skin infections may have painful lesions, subsequent bacterial infection, ulceration or severe inflammation. Visible skin abnormalities can also lead to taunting, social exclusion, shame, and stigma for affected youngsters. Such repercussions are particularly relevant in childhood when physical appearance, involvement in school activities, peer relationships and psychological development may be affected. Therefore, childhood skin infections should not be considered as trivial dermatological problems but as conditions that can have repercussions for education, social life and public health [5]. Infectious skin infections are still widespread in children in Nigeria and the stated frequency varies considerably among geographical locations and research populations. Previous studies have reported high prevalence rates of dermatophytosis and other infectious skin diseases in Nigerian children, especially in schools and health facilities. The prevalence of tinea capitis has also been said to vary with age, sex, location, socioeconomic circumstances and laboratory or clinical diagnostic methods [6]. These variances emphasise the necessity of generating local epidemiological evidence as findings in one geographical setting may not necessarily be extrapolated to another. The burden of skin infections in kids in Southeast Nigeria is of special relevance because of the largely tropical climate with relatively warm temperatures and significant humidity for much of the year in the region. These conditions may favour the survival and transmission of a wide variety of pathogenic organisms [7]. Furthermore, children are usually in close contact in homes, schools, religious settings, recreational settings and other group settings, offering opportunities for person-to-person transmission. Household activities including sharing clothes, towels, combs, bedding and grooming tools can also be a source of dermatophyte infection. However, the long-term hospital records [8] have not sufficiently characterized the extent to which these factors lead to hospital presentations in Imo State. One of the major limitations of the existing epidemiological information is that many

studies of childhood skin infections are based on school surveys, community screening activities, dermatological clinics or relatively short durations of observation. Community- and school-based research are useful to estimate burden of population, but hospital-based studies provide complementary information on the types of infections that lead to health care use. Hospital data can reveal patterns of diagnosed disease over time; diseases contributing to paediatric consultations and can offer useful evidence for clinical service planning. Data collected over a long period of time from multiple referral institutions may potentially provide a larger view of the burden of documented disease within the health care system [9].

But caution is advised in interpreting hospital prevalence. Children attending tertiary healthcare institutions are not always typical of children in the population surrounding these institutions. Mild or asymptomatic infections in children may not lead to a hospital visit and some may be managed in primary health care centers, pharmacies, patent medicine vendors, traditional practitioners or private clinics. Tertiary institutions, in contrast, might anticipate more severe, persistent, recurrent or diagnostically difficult cases. Therefore, the documented infections among healthcare attendees acquired from hospital records does not reflect the genuine population prevalence. This distinction is important for interpreting retrospective, hospital-based estimates [10]. However, long term retrospective investigations may give useful baseline information for public health surveillance. A ten-year review can define the cumulative impact of childhood skin infections and give evidence to increase diagnostic capabilities, treatment regimens, health education and preventative strategies. This kind of information is very useful to public health practitioners, clinicians, laboratory scientists, school health professionals and policy makers responsible for enhancing child health care. It may also provide a framework to construct prospective studies to explore specific behavioural, environmental, socioeconomic and clinical risk factors [11]. Despite the public health importance of childhood skin infections, long-term hospital-based research on dermatophytes and other infectious skin disorders from different tertiary institutions in Imo State is scarce. There is therefore a need to rigorously review accessible hospital data to determine the amount of recorded infections over a long period. Such evidence can help identify local disease load and drive targeted surveillance and preventative actions. The study consequently sought to investigate the hospital-based prevalence of dermatophytes and other reported skin illnesses among children aged 0-15 years attending selected tertiary health institutions in Imo State, Nigeria between January 2015 and December 2024. The study provides a longitudinal overview of documented childhood skin infections in selected tertiary health care settings over a ten-year period and provides evidence for improved

paediatric dermatological surveillance, health education, early diagnosis and appropriate management in the state.

MATERIALS AND METHODS

Study Design and Setting

This study employed a retrospective cross-sectional record-review design to determine the hospital-based prevalence of dermatophytes and other documented skin infections among children in Imo State, South-East Nigeria. The study was conducted in three referral healthcare institutions: Federal University Teaching Hospital, Owerri; Imo State University Teaching Hospital, Orlu; and a selected federal health facility in Okigwe. These institutions provide secondary and tertiary healthcare services to children referred from surrounding communities and primary healthcare facilities within Imo State and neighbouring areas.

The study covered a 10-year period from 1 January 2015 to 31 December 2024. Hospital records generated during this period were reviewed to identify documented cases of dermatophyte, bacterial, viral, and parasitic skin infections among children aged 0–15 years.

Study Population and Eligibility Criteria

The source population comprised children aged 0–15 years whose hospital attendances were recorded in the participating facilities during the study period. For the purpose of this study, an eligible case was defined as a paediatric record containing a clearly documented clinical and/or laboratory diagnosis of a dermatophyte, bacterial, viral, or parasitic skin infection.

Records were included when they contained sufficient information to establish the patient's age, sex, date of presentation, and diagnosis. Where available, information on the identified causative organism was also extracted.

Records were excluded if they involved children outside the specified age range, presentations occurring outside the study period, duplicate records relating to the same clinical episode, illegible records, or records with substantial missing information that prevented reliable classification of the diagnosis or other essential study variables.

Ethical Considerations

Ethical approval for access to the relevant medical records were obtained from the Ministry of Health Imo State before commencement of data collection. Because the study involved a retrospective, non-contact review of existing clinical records, a waiver of individual informed consent was sought and applied where approved by the relevant ethics committees.

Data Collection Procedure and Quality Control

Relevant information was retrieved from outpatient department registers, admission records, laboratory registers, patients' case notes, and available

electronic medical records. Data were abstracted using a structured data-extraction form developed specifically for the study.

The variables extracted included healthcare facility, study identification code, age, sex, date of presentation, diagnosis, and causative organism where documented. No patient names, hospital numbers, telephone numbers, addresses, or other direct personal identifiers were entered into the analytical dataset.

To ensure data quality, completed extraction forms were reviewed for completeness and consistency. Records were screened for potential duplication, missing or inconsistent information, and discrepancies between demographic and diagnostic variables. Annual case totals were cross-checked against available hospital registers and summary records where applicable. Where information was available from more than one source, relevant entries were compared to improve the accuracy and completeness of the final dataset.

Outcome Definition

The primary outcome was a documented diagnosis of any eligible skin infection, comprising dermatophyte, bacterial, viral, or parasitic infection, recorded among children aged 0–15 years during the study period.

For descriptive purposes, identified infections were classified according to their documented aetiological category. Dermatophyte infections included cases documented as dermatophytosis or specific tinea infections, while other skin infections were categorised according to the recorded bacterial, viral, or parasitic diagnosis. Where the specific causative organism was documented, it was recorded accordingly.

Statistical Analysis

Data were analysed using IBM SPSS Statistics version 21.0. Descriptive statistics were used to summarise the study population and documented skin infections.

The hospital-based period prevalence was calculated as the total number of eligible paediatric skin-infection cases recorded during the 10-year study period divided by the total number of paediatric attendance records reviewed during the same period, expressed as a percentage:

Hospital-based period prevalence (%) = (Number of documented skin-infection cases / Total number of paediatric attendance records) × 100

The prevalence was additionally expressed as the number of cases per 1,000 paediatric attendees to facilitate interpretation. A two-sided 95% confidence interval (CI) for the prevalence estimate was calculated using the Wilson score method, which provides an

appropriate interval estimate for binomial proportions, particularly when the observed proportion is relatively small. The confidence interval was independently verified using the aggregate numerator and denominator.

The analysis was primarily descriptive, with results presented using frequencies, percentages, prevalence estimates, and corresponding 95% confidence intervals, as appropriate.

RESULTS

A total of 17,200 paediatric attendance records were reviewed across the three institutions. Of these, 391 contained a documented diagnosis of a dermatophyte or another included skin infection. The resulting hospital-based period prevalence was 2.27% (95% CI: 2.06%–2.51%), equivalent to 22.7 cases per 1,000 paediatric attendees. Put differently, approximately one skin-infection case was documented for every 44 paediatric attendees.

Table 1: Hospital-based prevalence of dermatophytes and other skin infections among children attending selected tertiary health institutions in Imo State, 2015–2024.

Indicator	Estimate
Paediatric records reviewed	17,200
Documented skin-infection cases	391
Hospital-based period prevalence	2.27%
95% confidence interval	2.06%–2.51%
Cases per 1,000 attendees	22.7
Attendees per documented case	Approximately 44

DISCUSSION

The 10-year retrospective research showed that 2.27% of the paediatric attendance records in the selected tertiary healthcare facilities had a documented diagnosis of dermatophyte or other skin illness. The percentage observed is not very high, but it suggests a constant clinical load in the hospitals included in the study, and implies that infectious skin disorders were a recurrent aspect of the utilisation of healthcare services for children over the study period. This finding is noteworthy from a service-delivery standpoint, since even seemingly low proportions may translate into a considerable number of children requiring clinical examination, diagnosis, treatment, follow-up and, in some circumstances, specialist dermatological care. The observed hospital attendance-based prevalence was lower than other prevalence estimates reported from school and community-based studies of paediatric skin diseases in Nigeria [12]. This disparity is possible, but should not be construed as proof that the underlying burden of childhood skin infections in Imo State is necessarily lower than that described elsewhere. Differences in study design, sampling scheme, diagnostic criteria, geographical location, age distribution, and methods of case ascertainment can greatly affect estimates of prevalence. Studies in schools and the community actively screen or evaluate children and so may detect mild, asymptomatic, untreated, or previously undetected infections. Conversely, hospital-based monitoring depends on healthcare-seeking behaviour, referral patterns, clinical recognition, diagnostic practice, and completeness of medical documentation [13]. Moreover, children with simple skin infections can be treated outside of tertiary institutions, including at primary healthcare facilities, private clinics, pharmacies, patent medicine outlets, or through self-medication and home-based practices. Such youngsters would not be identified in the records evaluated in the

current investigation. In contrast, tertiary referral centers may over-represent children with persistent, recurring, severe, atypical or treatment-resistant illnesses. Hence, prevalence based on hospital attendance shows the burden of recorded disease among healthcare attendants rather than the frequency of infection in the general paediatric population [14]. The persistence of dermatophytes and other infectious skin disorders in the research context may be a reflection of combination of environmental, behavioural, socioeconomic and health care related factors. The climate of Southeast Nigeria is generally suitable for fungal growth and transmission especially during periods of high temperature and humidity. Transmission of dermatophytes may be promoted by close interpersonal contact among children, home congestion, and sharing of personal goods such as combs, brushes, towels, clothing, bedding, and hair-grooming equipment. Persistence and transmission may be further promoted by socioeconomic hardship, restricted access to healthcare, late presentation, poor health awareness and incomplete treatment [15]. However, these proposed mechanisms should be taken with caution. This study was retrospective, based on hospital records and did not collect individual-level data on household crowding, personal cleanliness, socioeconomic position, school attendance, contact history, environmental exposures and past treatment. The study cannot therefore determine if any of these factors contributed to the observed prevalence. They are better considered as reasonable explanations based on the current literature rather than causal determinants established by the present investigation [16]. The public health consequences of these results extend beyond individual clinical management. Skin infections in childhood can result in discomfort, itching, sleep disturbance, school absences, stigma and diminished quality of life, and some infections, if left untreated or inadequately treated, can lead to complications or continuing transmission. Thus, early identification and

adequate treatment are critical components of child health services. Consistent diagnostic nomenclature and unambiguous differentiation between suspected clinical illnesses and laboratory-confirmed infections should reinforce the routine reporting of juvenile dermatoses [17]. Laboratory studies, such as direct microscopy, fungal culture or other relevant diagnostic procedures, can increase diagnostic certainty when clinically required, especially in recurring, widespread, unusual or treatment-resistant disease. Improved laboratory-clinical collaboration can help enhance identification of dermatophyte infections and prevent improper empirical treatment. Standardised recording systems would also enable health facilities to monitor trends in specific skin illnesses over time and to evaluate the impact of interventions [18]. The findings also highlight the potential value of integrating facility-based surveillance with school- and community-based efforts on skin health. Periodic screening or targeted evaluation in schools could identify those children who do not present to tertiary hospitals and would give a better understanding to the community burden. Health education should focus on early identification of suspected skin and scalp lesions, early consultation with a healthcare provider, compliance with prescribed treatment, not sharing grooming items and towels, and good hygiene habits. Such interventions should be aimed at promoting healthy behaviour and not stigmatising children affected by skin infections [19]. Clear referral pathways are also critical for children with widespread, recurring, inflammatory, atypical or treatment resistant infections. Primary health care workers and other frontline providers should be able to recognise conditions warranting specialist examination and appropriate laboratory testing. A coordinated approach of basic healthcare facilities, schools, tertiary hospitals, laboratory services, parents and community health workers may increase early diagnosis and shorten the duration of untreated infection [20].

CONCLUSION

A examination of paediatric attendance data at selected tertiary healthcare institutions in Imo State from 2015 to 2024 found that 2.27% of cases had dermatophytes and other recognised infectious skin diseases. However, this estimate is based on hospital attendances rather than community prevalence. But the findings show that skin infections in childhood are a consistent feature of paediatric healthcare presentations in the research context. The reported prevalence should not be construed as a low burden of disease in the population as children with skin infections may be managed in the community outside of tertiary hospitals or may not seek official healthcare. The findings consequently provide not only an important healthcare-service baseline but also indicate the necessity for complementing community-based evidence. Strengthened regular surveillance, standardisation of clinical and laboratory documentation, improved access to appropriate diagnosis and treatment and school- and

community-based skin-health teaching could facilitate improved early detection and management. Future multicentre community studies are recommended to determine the population prevalence, identify important behavioural and environmental risk factors, characterise the major dermatophyte and other infectious agents involved, and assess temporal and geographical patterns of childhood skin infections in Imo State and the wider Southeast Nigerian region.

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