Article Two

Investigation of Scabies Outbreak at Sandwe Primary School in Lusangazi District, Zambia

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Abstract

Introduction: Scabies is a preventable neglected tropical disease caused by infestation with Sarcoptes scabiei. It has a global prevalence ranging from 0.3% to 46.0%. We investigated an outbreak of scabies at Sandwe Primary School in Lusangazi District to determine its magnitude, identify cases, and implement prevention and control measures.

Methods: The investigation was conducted between 30 March and 5 April 2022. A case was defined as any school child presenting with an intensely pruritic rash affecting at least one typical site, with or without visible burrows or a positive skin scraping. We reviewed health facility registers, interviewed learners, conducted clinical examinations, collected skin scrapings, and performed environmental assessments. Data were analysed using descriptive statistics, and attack rates were calculated with 95% confidence intervals.

Results: A total of 26 cases were identified among learners aged 4-17 years. Most cases were male (73%). The overall attack rate was 4.5% (26/578). Boarders were more affected than day scholars, accounting for 58% of cases. Skin scrapings were positive for Sarcoptes scabiei ova in 54.5% (6/11) of samples. Key risk factors included sharing sleeping spaces, clothing, bath sponges, and close contact with infected individuals. Overcrowding and inadequate sleeping facilities contributed to transmission.

Conclusion: A propagated scabies outbreak occurred in a school setting, predominantly affecting male boarders. Control measures included health education, mass treatment with scabicides, and environmental disinfection. We recommend decongestion of sleeping spaces and improvement of boarding infrastructure.

Introduction

Scabies is a neglected tropical disease that remains a major public health problem in resource-limited settings, despite being preventable and treatable. It is an ectoparasitic skin disease caused by Sarcoptes scabiei var. hominis, resulting in an intensely pruritic skin eruption. It is among the most common dermatological conditions in developing countries and contributes significantly to the burden of skin diseases (1).

Globally, scabies is estimated to affect more than 200 million people at any given time, with approximately 400 million cases occurring annually. Prevalence ranges from 5% to 50%, particularly in overcrowded and resource-poor settings (1,2).

Typical clinical features include superficial burrows, intense itching (especially at night), and a generalized rash affecting areas such as the wrists, elbows, axillae, groin, buttocks, and interdigital spaces (3-5). Scabies can lead to secondary bacterial infections, including impetigo, sepsis, renal complications, and rheumatic heart disease (3,6).

The disease imposes a substantial burden through stigma, social isolation, absenteeism from school, and sleep disturbances. Outbreaks are commonly reported

in crowded settings such as schools, boarding facilities, and institutional environments.

On 30 March 2022, an alert of approximately 15 suspected scabies cases was received from Sandwe Rural Health Centre, all originating from Sandwe Primary School. On 5 April 2022, a district team visited the school to investigate the outbreak. The objectives were to determine the magnitude of the outbreak, identify cases, implement control measures, and prevent future occurrences.

Methods

Study Design and Setting

A descriptive outbreak investigation was conducted between 30 March and 5 April 2022 at Sandwe Primary School in Lusangazi District, Eastern Province, Zambia. The investigation was undertaken following notification of suspected scabies cases from Sandwe Rural Health Centre.

Case Definition and Case Finding

A case was defined as any pupil attending Sandwe Primary School between March and April 2022 who, on clinical examination, presented with an intensely pruritic rash affecting at least one typical site (e.g., wrists, elbows, axillae, groin, or interdigital spaces), with or without visible burrows or a positive skin scraping.
Cases were identified through review of outpatient department (OPD) registers at the health facility, active case search at the school, and clinical examination of learners using standard skin assessment procedures. All identified cases were recorded in a line list.

Data Collection

Data were collected through record reviews, interviews with affected learners, clinical examination, and environmental assessment. Information obtained included demographic characteristics, clinical presentation, and potential exposures such as sharing of sleeping spaces, clothing, and bathing materials. Skin scrapings were collected from a subset of suspected cases and examined for the presence of Sarcoptes scabiei ova to support clinical diagnosis. An environmental assessment of classrooms, dormitories, bathing areas, and water and sanitation facilities was conducted to identify conditions that could facilitate transmission.

Data Analysis

Data were entered in excel and analyzed using descriptive statistics. Frequencies and proportions were generated for key variables. The overall attack rate was calculated using the total school population as the denominator.

Ethical Considerations

Permission to conduct the investigation was obtained from the Lusangazi District Health Office and the District Education Board Secretary (DEBS). Assent was obtained from all learners who participated in interviews and examinations. All data were anonymized and handled confidentially.

Results

Outbreak Detection and Case Identification

Review of outpatient department (OPD) registers at Sandwe Rural Health Centre indicated an increase in cases recorded as skin infections, with most originating from Sandwe Primary School. Initial reports identified 15 suspected cases from Grades 7 and 9 (Table 1). Subsequent active case-finding and clinical examination at the school identified additional learners presenting with pruritic skin rashes on the arms, legs, chest, and inguinal regions. A total of 26 cases were identified, with no hospitalizations or deaths reported.

Magnitude of the Outbreak and Demographic Characteristics

The overall attack rate was 4.5% (26/578) based on the total school population. Among the identified cases, 58% (15/26) were boarders and 42% (11/26) were day scholars. Of the 26 cases, 73% (19/26) were male, and 27% (7/26) were female. The majority of cases, 69% (18/26), were aged 12–17 years. Cases were evenly distributed across lower (Grades 1–7) and upper (Grades 8-9) classes, each accounting for 50% (13/26) of cases (Table 1).

Clinical Presentation

All cases (100%) presented with itching, and clinical examination identified burrows in all cases. The most commonly affected body sites were the feet (62%), groin (50%), arms (46%), and chest (38%). Less frequently affected areas included the armpits (31%) and buttocks (3.8%) (Table 1).

Laboratory analysis of skin scrapings from a subset of cases showed that 54.5% (6/11) were positive for Sarcoptes scabiei ova, supporting the clinical diagnosis.

Exposure and Transmission Factors

Interviews with affected learners revealed several potential transmission factors. These included sharing of sleeping spaces, clothing, bath sponges, and buckets, as well as close physical contact with affected individuals. Sharing of sackcloth used as bedding and bed spaces was commonly reported, particularly among boarders.

Environmental Assessment Findings

Environmental assessment revealed conditions conducive to transmission. Classrooms were overcrowded, with inadequate desks and benches, leading some learners to sit on the floor.

Dormitory conditions were suboptimal. Boys were accommodated in a classroom used as a dormitory, where 11 pupils slept on sackcloth without beds or mattresses, with 2-3 learners sharing a sleeping space. Ventilation was poor due to damaged windows. Girls were housed in semi-detected structures with poor ventilation, no lighting, and limited infrastructure.

Bathing facilities were inadequate, with shared use of a limited number of buckets and sponges. Although the school had a functional borehole providing safe water, handwashing facilities lacked soap.

Public Health Response

Control measures were instituted promptly. Affected learners were treated with scabicides, and antibiotics were administered to prevent secondary bacterial infection. Health education sessions were conducted to raise awareness on transmission, symptoms, and prevention. Active case finding and daily screening were implemented to identify new cases, and environmental hygiene measures, including cleaning and disinfection of sleeping spaces, were undertaken. Ongoing surveillance was maintained by the school and the health facility.

Table1: Demographic and Clinical Characteristics of scabies cases at Sandwe Primary March 2022

Characteristics	Frequency (%)
Sex	
Male	19 (73)
Female	7 (27)
Age	
7-11	3 (12)
12-17	18 (69)
18-24	5 (19)
Grade	
1 – 7	13 (50)
8 – 9	13 (50)
Learner type	
Day Scholar	11 (42)
Boarder	15 (58)
Presentation	
Itching	26 (100)
Burrows	26 (100)
Distribution of skin lesions	
Feet	16 (62)
Groin	13 (50)
Arms	12 (46)
Chest	10 (38)
Armpits	8 (31)
Buttocks	1 (3.8)

Discussion

The findings of the outbreak investigation have demonstrated that outbreaks of scabies are common in areas of poor sanitation and crowded living conditions. The findings compare to the findings of an investigation conducted in Kacharia district Ethiopia (12). Attack rate was higher among males than females, a finding which compares to the study conducted in Ghana and Ethiopia (13)(4,5,8) Another study conducted in Ethiopia revealed 49% of cases among the school going children, similarly, the outbreak in Sandwe occurred in a school with crowded conditions and poor sanitation in which the outbreak occurred in a school. Scabies spread/transmission was related to crowding in the classrooms and sleeping places, as evidenced by a higher number of cases among boarders than day scholars, as well as sharing of sleeping spaces and sponges(2-4,6,9,15). Sharing a bed, sleeping with a family member affected by scabies, was associated with scabies infestation (9), which corresponds with our findings, in which cases had a history of contact with scabies cases at home or at school due to overcrowding in the classrooms and dormitories. This may further be attributed to the contagious nature of scabies, and one of the commonest ways of transmission is through body contact, and mites easily pass from the infested person to a normal one (15). The most affected age group was 12-17 years old, a similar age range seen in other studies (15). This resonates with findings from studies conducted in Ghana and Ethiopia. A study conducted in Ethiopia showed a relationship between drought and the occurrence of skin infections such as scabies. This was not so at Sandwe were water supply was adequate (16), although water was adequate at Sandwe, utilization practices were poor(10,15,16). Another study conducted in Ethiopia, sharing bed spaces, overcrowding was associated with increased risk for scabies, similar to the study findings (7). The school was not a designated boarding school and lacked proper boarding school infrastructure, although it was designated as a weekly boarding school, which explains the type of sleeping spaces that contributed to the transmission. Although the outbreak investigation was on time, the number of cases may have been under-estimated due to non-reporting of mild cases. Transportation of samples outside of the district may have increased turnaround time. Small sample size, time-limited data analysis and interrogation of possible risk factors .

Conclusion

Although scabies remains a common neglected tropical disease, it can be eradicated through health education improving hygiene practices in communal places such as schools, classes, and dormitories. Diagnosis and confirmation of cases were based on expert examination of the cases and clinical findings. For future control of scabies, we recommended adequate supplies of medicated creams to the affected learners.

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