

Original Research Article

Upsurge in the incidence of scabies (a neglected tropical disease) in some rural communities of Southeast Nigeria: any nexus with climate change?

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ABSTRACT

Background: Scabies is characterized by the presence of burrows, erythematous papules, and generalized pruritus which is usually worse at night. Recently an upsurge in the incidence of scabies has been reported in many settings, including the area of the study. The study aimed to determine if there is a nexus between scabies and climate change as a risk factor.

Methods: This was a case-control study carried out in a Cottage Hospital. Case files of 18, 000 patients who attended the hospital between 2016 and 2019 were reviewed. The diagnosis was mainly clinical, i.e. based on the presence of itching in the typical scabies locations, presence of scabies burrows and history of similar itching in the other members of the patient's household. 112 cases of scabies were diagnosed within this period.

Results: From 2016 to 2019, the incidence of scabies rose from 3 to 50. Prevalence among males was 59.8%, and in females 40.2%, although the difference was not significant ($p=0.053$). Compared to other age groups, prevalence was highest in the 6-17 years age group (37.5%), but the difference among the age groups was also not significant ($p=0.84$).

Conclusions: Within four years (2016-2019), the incidence of scabies had risen from 3 to 50 in the area of the study, being higher in males (59.8%) than females (40.2%), and in children less than 18 years (37.5%). Community survey, prompt diagnosis, adequate treatment and avoidance of overcrowding might help to stem the observed rising incidence of the disease.

Keywords: Change, Climate, Incidence, Scabies, Upsurge

INTRODUCTION

Long term variations in the climate variables (such as rainfall, temperature and wind pattern) spanning decades to centuries constitute climate change. This change in climate can have negative effects on the environment, health, economy, and agriculture, among others.

With respect to health, the implications of climate change include, among others, increase in the breeding of vectors of infectious diseases and outbreak of water-related diseases, including water washed diseases such as scabies, an ectoparasite infestation caused by the female mite *Sarcoptes scabiei* variety *hominis* and transmitted by

person-to-person contact. It can also be transmitted by sexual contact.¹ Scabies is characterized by the presence of burrows (serpiginous whitish lines in the outer epidermis of several millimetres in length), erythematous papules, and generalized pruritus which is usually worse at night. The itchy rash is thought to be due to allergic reaction that occurs to the trail of debris, faeces and saliva.

In the vast majority of cases of common scabies (also known as ordinary, classical or typical scabies), there is low number of mites in the patient's body. Crusted scabies (formally known as Norwegian scabies) is a rare form of the disease characterized by hyperinfestation with

thousands to millions of mites and hyperkeratotic crusted skin. Scabies has predilection for specific parts of the body. Classic locations of the burrows are the interdigital spaces of the hand, the flexural surface of the wrists, elbows, genitalia, axillae, umbilicus, belt line, nipples, buttocks, and penile shaft.²⁻⁴

No one is exempt from scabies. It can affect all socioeconomic groups and is not a result of poor hygiene. However, it is particularly associated with poverty and overcrowding.⁵ Because of the growing importance of scabies infestation, the World Health Organisation in 2017, added it to the list of neglected tropical diseases (NTDs).⁶

The diagnosis of scabies is not always a straightforward one. It may sometimes present some diagnostic difficulties to clinicians. However, in majority of the cases, the diagnosis rests mainly on the history and physical examination, as well as the history of concurrent infection among household members and close contacts. A presumptive diagnosis can be made on the basis of the history of nocturnal pruritus and a typical distribution of the skin lesions.³ Definitive diagnosis relies on the identification of mites, eggs, eggshell fragments, or mite pellets under the microscope. In rare cases, scabies can also be diagnosed using polymerase chain reaction (PCR) and enzyme linked immunosorbent assay (ELISA) to detect scabies DNA.⁷

Complications of scabies are mainly related to sleep loss due to pruritus and secondary bacterial infections arising from infection of excoriated skin surfaces from scratching. The best documented complication of scabies is superinfection caused by *Staphylococcus aureus* and group A *Streptococcus* usually implicated in glomerulonephritis and rheumatic fever.⁸ Treatment of scabies consists in management of infested patients and all their close contacts concomitantly, regardless of the presence of symptoms with topical agents (5% permethrin) and ivermectin 200 µg/kg body weight given in two doses 2 weeks apart.

Prevention of scabies involves treatment of all contacts (even if not symptomatic), sterilization of beddings and clothes with heat and insecticides, and mass treatment with permethrin and ivermectin.

The prevalence of scabies around the world is difficult to estimate owing to paucity of data from the individual countries as a result of the pooling of the unreported cases in the communities. Secondly, community surveys to capture these unreported cases are few. Maybe now that scabies has been designated a neglected tropical disease, interest in its research might be correspondingly stimulated. In 2016, the global burden of disease (GBD) study estimated the global point prevalence of scabies to be around 147 million, with 455 million annual incident cases.⁹ Further GBD analyses estimated that scabies caused approximately 3.8 million disability-adjusted life-

years (DALYs), ranking it as one of the most important NTDs.¹⁰ The burden of the disease is said to be highest in the developing countries where the disease is endemic, while in the developed world it occurs as an epidemic in hospitals, nursing homes, and long term care facilities.¹¹ Few available studies from across Africa report different prevalence rates. For instance, among school children in Ethiopia, a 2018 study found a prevalence of 9.3%.¹² In Nigeria an incidence rate of 2.4% was reported by.¹³

Although epidemiological studies indicate that the prevalence of scabies is not affected by sex, race, age, or socioeconomic status, it is most commonly observed in the very young children, followed by older children and young adults.¹⁴⁻¹⁶ Observations have shown that the incidence of scabies has been on the rise in our clinical setting since 2016. The reason for this recent upsurge in clinical scabies is not known to us, although climate change is being suspected as an important factor. This is why this study has been designed to investigate the cause of this sudden increase in the number of cases and its possible link with climate change as a risk factor.

METHODS

This was a case-control study carried out in Cottage Hospital Inyi, Oji River Local Government Area of Enugu State, Southeast Nigeria. Case files of all patients who attended the hospital between 2016 and 2019 were examined for diagnosis of scabies. The diagnosis in this setting was mainly clinical, i.e. based on the presence of itching (which was worse at night) in the typical scabies locations, presence of scabies burrows and history of similar itching in the other members of the patient's household.

The study site, Cottage Hospital Inyi, is a rural hospital serving the adjoining communities of Inyi, Achi, Awlaw and Akpugoeze. Although some houses in these communities could be said to have met the standard housing conditions as laid down by the local town planning and housing authority, majority of them do not meet these conditions, and therefore are prone to overcrowding which is one of the risk factors for scabies.

The population of the study was made up of all the patients who attended the hospital between 2016 and 2019 (18, 000). The sample size was constituted by all the clinically diagnosed cases of scabies. In all, 112 cases of scabies were diagnosed within this period. Data were collected for a period of two months (November to December 2020) and analysed as proportions, t tests and one way ANOVA using MaxStat statistical software (version 3.60). P value ≤0.05 was considered significant.

RESULTS

Table 1 presents the annual incidence (and corresponding prevalence) of scabies from 2016 to 2019. As shown in the table, the prevalence of scabies increased from 0.1%

(3 out of 4500) to 1.1% (50 out of 4500) within four years, with a mean annual prevalence of 0.6%. This signifies an upward trend in the incidence and prevalence of scabies within the years in question (about 16 times greater than the incidence in the index year).

Table 1: Annual incidence and prevalence of scabies (n=4500).

Year	Number of cases	Prevalence (%)
2016	3	0.1
2017	15	0.3
2018	44	1.0
2019	50	1.1
Total	112	
Mean	32	0.6

The sex distribution of scabies is shown in Table 2. From the table, it is seen that scabies was more prevalent in males (59.8%) than females (40.2%). However, the observed difference between males and females in the incidence of scabies did not have statistical significance ($p=0.53$).

Table 2: Sex distribution of scabies (n=112).

Sex	Number of cases
Male	67 (59.8)
Female	45 (40.2)
Total	112
t	0.66
p	0.53

Table 3 shows the age distribution of scabies. As shown in the table, the prevalence of scabies was highest in the 6-17 years age group (37.5%) compared to 18 years and above (32.1%) and 0-5 years (30.4%). There was no statistically significant difference among the three age groups ($p=0.84$), the observed differences in prevalence notwithstanding.

Table 3: Age distribution of scabies (n=112).

Sex	Number of cases (%)
0-5	34 (30.4)
6-17	42 (37.5)
18+	36 (32.1)
F	0.17
P	0.84

DISCUSSION

The designation of scabies as a neglected tropical disease (NTD) in 2017 by the World Health Organisation (WHO) marked a turning point in the public perception of scabies against the backdrop of its increasing incidence in the tropical and subtropical regions where it is endemic. Another reason for this designation was the broad neglect

of scabies across multiple research domains.¹⁷ Presently there is paucity of data concerning the prevalence of scabies globally as a result of scanty number of researches. This notwithstanding, the few available studies have shown that there is a high prevalence of scabies in developing countries and that it is attributed to poverty, poor nutritional status, homelessness/overcrowding and poor hygiene.¹⁸ In this study, findings indicate that there has been a rise in the incidence of scabies from 2016 to 2019 (from 3 cases in 2016 to 50 cases in 2019). Although the incidence has shown an upward trend, this does not fully reflect the true situation in the area of the study. This is because observation has shown that scabies cases are grossly under-reported in the hospitals. The bulk of the unreported cases are in the communities. Among the reasons for this unwillingness to report the cases is illiteracy on the part of the patients who consider scabies (the 'itch disease') not serious enough to visit the hospitals, hence their poor health-seeking behaviour. Consequently, they opt for self-medication instead. The reason for the steady rise in the prevalence of scabies found in the area of the study is not completely understood. However, considering the fact that this is a rural setting, it could be deduced that the same factors as observed in other settings might also be at play here, i.e. poor housing/overcrowding resulting from poverty, poor nutritional status and poor hygiene. In addition poor health seeking habit and inadequate treatment of cases might have contributed to the rise in incidence too. Furthermore, population displacement resulting from climate change and insurgency in some parts of the country could lead to overcrowding. Increase in the breeding of insect vectors of diseases is one of the health implications of climate change. It could also be considered a factor here, given the fact that climate change is occurring all over the world and Nigeria is not an exception. Population displacement due to climate change and the current insurgency in the Northern part of the country is thought to be responsible for this observed upsurge since the other drivers of scabies infestation have always been with the people, while climate change and insurgency are relatively recent in origin.

The study found scabies to be more prevalent among males (59.8%) than females (40.2%). However, there was no statistically significant difference between them. This finding is similar to what had been reported earlier on by other researchers.^{13,19} On the contrary, some other past studies did not show any difference in prevalence between males and females.^{15,16,20} The observed higher prevalence in males might be as result of the higher probability of population displacement among males in search of employments and this predisposes them to overcrowding because of inadequate housing accommodation associated with these movements. This finding could also be attributed to the fact that the males are usually more sexually active than the females generally. And studies have shown that scabies can also be transmitted sexually.^{1,21}

Further finding by the study revealed that the prevalence of scabies was highest in the 6-17 years age group (37.5%) even though there was no significant difference among the various age groups. Some past studies had also reported higher prevalence of scabies in children less than 18 years, although with various prevalence figures.^{18,19,23-26} Higher prevalence of scabies in children is believed to be due to increased exposure to the parasite and lack of immunity of the host.²⁰ This finding could also be attributed to poorer hygiene practice among children, given the fact that poor personal hygiene is a risk factor for the scabies infestation.

CONCLUSION

There has been an obvious upsurge in the incidence of scabies in the area of the study in recent times (from 3 cases in 2016 to 50 cases in 2019), although this represents a tip of the iceberg for many cases remain unreported in the community. This increase in the number of cases seen is thought to be due to overcrowding, poor nutritional status, inadequate treatment and population displacement resulting from climate change, among others. The incidence of scabies was found to be higher in males than female, and highest in children less than 18 years compared to other age groups.

Prompt diagnosis, adequate treatment, improving housing conditions to prevent overcrowding occasioned by population displacement due to climate change and community survey to find the unreported cases among the people could help to halt this upsurge in the incidence of scabies found in the area of the study.

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