



Ring Worm Skin Infection in a Rural Community of Bushenyi (Uganda)

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Authors' contributions

This work was carried out in collaboration between all authors. Authors SAT, MAU, MAS, EMA, GA, MSD, GOO, HAH and NM carried out data collection and manuscript review. Authors SAT, MAU, MAS, EMA, LNM, IE and KIK carried out data analysis, literature search, manuscript writing and review. All authors read and approved the final manuscript.

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ABSTRACT

Aim: Ring worm skin infections which have continuously been neglected in several communities of sub Saharan Africa, thus leading to the development of herbal remedies as communities seek to find solutions to the menace. The aim of this study was to assess the community skin ring worm

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infections and their associated risk factors in South Western Uganda.

Materials and Methods: This was a cross sectional study in a rural community of Bushenyi district in South Western Uganda. A total of 34 homesteads were randomly selected and a semi-structured questionnaire was used for data collection.

Results and Discussion: The study showed that majority of homesteads which accessed water from non protected springs, 41.2% had ring worm skin infection of the head (*tinea capitis*), 11.8% due to *tinea corporis* and 5.9% either due to *tinea unguium*, *tinea cruris*, *tinea corporis*, *tinea circinata*, or *tinea glabrosa*, *tinea pedis* and *tinea barbae* which are generalized in different parts of the body. The major risk factors identified were water security (P = 0.01) and community treatment practices (P = 0.002) against the dermatophytes. Despite the fact that some homesteads attempted to treat the skin infections, other homesteads didn't bother to seek treatment thus posing a major risk factor for the re-infection in the community.

Conclusion: The adoption of ethno-medicinal plants for management of skin infection has been shown to be greatly adopted by this rural community, thus a follow up study to understand the anti-fungal activity of a selected herbal plant from the community is highly encouraged.

Keywords: Skin infections in Uganda; community dermatophytes; Tinea.

1. INTRODUCTION

Health has been shown to have a wide array of definitions and this would probably be due to the social demographic factors in most rural communities of sub Saharan Africa [1,2]. The poor distribution of medical and community health professionals in a majority of rural settings is believed to be a major limitation for the development of community livelihoods and health service delivery [2,3]. Due to the above, Uganda still has high rural community deaths which would otherwise be prevented and these include HIV/AIDS, malaria, diarrhea, pneumonia, diabetes, hypertension as they continue to cause a lot of morbidity and mortality in the local populations [4,5]. Other related nuisance community infections such as ring worm skin infections have also proved to be a problem in these rural communities probably as a result of poor hygienic standards [1]. This has subsequently led to the quick adoption of herbal therapies for the management of these (nuisance) illnesses as most rural health centers are ill equipped to manage the infections [6-9]. Recently, fungi have been recognized as important pathogens in Uganda; partly due to increasing debilitating rates that have been attributed to more widespread use of immunosuppressive therapies, and the indiscriminate use of broad-spectrum antibiotics [9,10].

Dermatophytes are acquired through contact of an individual with conidia present in soil, animals, or objects such as combs, shoes, or clothing [11]. Tropical Uganda has got favorable climatic conditions which allow longer contact between conidia and skin especially spaces between nails

and interdigital areas or hair as these have been shown to be more prone to harbor these infections [12]. These infections are designated tinea or ringworm, followed by the affected body site. Examples include *tinea unguium* or onychomycosis (in nails), *tinea cruris* (in the groin), *tinea corporis*, *tinea circinata*, or *tinea glabrosa* (in the extremities), *tinea pedis* (athlete's foot), *tinea capitis* or tonsurans (in the scalp) and *tinea barbae* (in the beard) [13]. All tineaes have a similar clinical pattern, showing a ring of scaling inflammatory skin that is accompanied by burning and itching [14]. The main skin diseases seen in major referral health facilities in most Sub Saharan countries are pyoderma, scabies, *tinea capitis* (on the head), *tinea corporis* (body skin) and variants of superficial mycoses, and mainly eczema [15]. A lot of effort has been placed on the development of pharmaceutical agents but due to challenges of cost, these hardly reach the vulnerable rural communities. In this study we visited a rural community in Bushenyi district of South Western Uganda and assessed major skin ring worm infections and their associated risk factors. The aim of the study was to assess the major public health concerns of skin infections in the community.

2. MATERIALS AND METHODS

This was a cross sectional study in a rural community of Ryanshana II village, Kashenyi Parish, Ishaka division of Bushenyi district in South Western Uganda for a period of three months (January – March 2014). A total of 34 homesteads were randomly selected and a semi-structured questionnaire was used for data

collection. The questionnaire was administered to only family heads who were found in the individual homesteads irrespective of the family size.

2.1 Questionnaire Questions

The questionnaire addressed questions on the type of ring worm infection in the respective homestead, the major source of water, water security and adequacy, household hygiene, and treatment/management practices.

2.2 Statistical Analysis

Data was checked for normalcy in Microsoft Excel version 10, transferred in SPSS Version 16 and descriptive analysis was carried out and a Pearson chi-square (P) value < 0.05 was considered statistically significant.

3. RESULTS

The study showed that over 80% of the homesteads used water from unprotected springs, and of these 41.2% had ring worm skin infection of the head, 11.8% had skin ring worms and 5.9% had generalized infection. No association ($P = 0.5$) was found between water source and skin infection. Over 85% of the homesteads had adequate water all year round, and of these 47.1% had skin infection on the head, 11.8% on the body, and 2.9% generalized. There was a strong association ($P = 0.01$) between water adequacy and skin infection. Over 50% of the homesteads either used herbs or herbs and creams for management of skin infection. Of these, 44.1% used only herbs for

management of skin infection of the head (32.4%), body (5.9%), and only 5.9% for generalized ring worms. Homesteads that used herbs and creams concurrently had major problem of both head (8.8%) and body (5.9%) skin ring worm infection. Some homesteads didn't treat the skin ring worm infection (17.6%), of which 8.8%, 2.9% had both head and body skin ring worm infection respectively. There was a strong association ($P = 0.002$) between fungal treatment and skin ring worm infection as shown in Table 1.

4. DISCUSSION

The study showed that majority of homesteads which accessed water from non protected springs, 41.2% had ring worm skin infection due to *tinea capitis* which is associated with head infection, 11.8% had ring worms due to *tinea corporis* associated with the body and 5.9% had ring worms either due to *tinea unguium*, *tinea cruris*, *tinea corporis*, *tinea circinata*, or *tinea glabrosa*, *tinea pedis* and *tinea barbae* which are generalized in different parts of the body. This would probably be due to the low hygienic practices in the homesteads and this still remains to be the government's priority for the attainment of the Millennium Developmental Goals (MDGs) [4]. The major risk factors identified were the usage of water security ($P = 0.01$) and community treatment practices ($P = 0.002$) against the dermatophytes. Majority ($> 50\%$) of the homesteads used herbs of unknown mechanism of action and therapeutical dosage thus showing a great increase in the adoption of ethno-medicine for management of skin infections [6,10]. Despite the fact that some

Table 1. Showing types of skin infection in the rural community and associated risk factors

Parameter	Variable	Frequency of ring worm skin infections (%)				
		Head	Body	All the body	None	Total
Water source	Prot. well	0 (0)	0 (0)	0 (0)	1(2.9)	1(2.9)
	Un-Prot.	14 (41.2)	4 (11.8)	2 (5.9)	8 (23.5)	28 (82.4)
	Bore hole	4(11.8)	1 (2.9)	0 (0)	0 (0)	5 (14.7)
Water adequacy and security	Annually	16 (47.1)	4 (11.8)	1(2.9)	8(23.5)	29 (85.3)
	Rainy season	0 (0)	0 (0)	1(2.9)	0 (0)	1(2.9)
	Inadequate	2(5.9)	1(2.9)	0 (0)	1(2.9)	4(11.8)
Treatment options	Herbs	11(32.4)	2(5.9)	2(5.9)	0 (0)	15(44.1)
	Creams	1(2.9)	0 (0)	0 (0)	0 (0)	1(2.9)
	Herbs and creams	3 (8.8)	2(5.9)	0 (0)	0 (0)	5 (14.7)
	None	3 (8.8)	1(2.9)	0 (0)	9(26.5)	13(38.2)

Key: Prot. = protected; Un-prot. = un-protected well; Yr = year

homesteads attempt to treat the skin infections, other homesteads don't bother to seek treatment thus posing a major risk factor for re-infection in the community as shown in Table 1. Since dermatophytes are mainly acquired through contact with conidia parasites in soil, animals, or objects such as combs, shoes, or clothing, household hygienic practices need to be further strengthened through increased extension service delivery [11]. The fact that sub Saharan Uganda has a tropical climate, which is favorable for multiplication of the conidia parasites, personal hygiene should be further emphasized through a couple of extension service outreach projects [12]. This would help to reduce on the incidence and public health risk posed by skin infections in the region and above all lead to healthy happier communities [15].

5. CONCLUSION AND RECOMMENDATIONS

Skin infections were shown to be a major problem in this rural community and the major risk factors identified were water security, and community treatment practices against the dermatophytes in the community. Communities have henceforth adopted medicinal plants to manage this condition, thus a follow up study to understand the anti-fungal activity of a selected herbal plant from the community, assess its mechanism of action, and effective therapeutical dosage is highly encouraged. Community outreach activities should be modified to improve on community awareness on skin infections and their control for the promotion of public health.

ETHICAL CONSIDERATIONS

Authors hereby declare that the study was approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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