Individual vs. Household Treatment for Scabies or “gratti gratta” in the population of Lambaréné and surroundings in Gabon

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Introduction (Background)

Scabies, a contagious skin infestation caused by the mite Sarcoptes scabiei, of which the most common symptoms are itching and rash, remains a big health issue in the developing world. Major health implications include pyoderma and renal and heart disease, due to secondary bacterial infections. Furthermore, managing the disease can come at significant cost to health care systems(1,2). Children are the most affected group in the developing world(3).

There is no exhaustive data on Scabies prevalence in Gabon, however one can assume that it is endemic as in other tropical regions(1). The hot and humid climate, often poor sanitation and many family members living in the same house are all factors that favor high scabies prevalence. One study assessing the prevalence of skin diseases among school children in Gabon found a low prevalence of scabies, which stands in contrast to other studies(4).

Some studies, mostly conducted in the developed world, suggest a cyclical epidemiology of Scabies, stating cycle lengths of 15-30 years(5–7). However according to a recent review by Hay et al., observed fluctuations are most likely multifactorial, being related to factors such as wartime, overcrowding, and climatic changes, with herd immunity playing a limited role(1). No literature was found on epidemic cycles in Gabon.

The clinical presentation of scabies has been previously described in other tropical regions. A recent study conducted in Yaoundé showed lesions were most commonly present in the infra-gluteal folds, on the wrists and in the intergluteal folds. Types of lesions were also documented, with crusty lesions being the most common type(8).

For persons never before affected by scabies it can take up to 6 weeks for symptoms to begin, while the mites can already be spread during this asymptomatic period. However in reinfestation symptoms usually occur much earlier(1-4 days)(9).

There exist different agents for the treatment of Scabies with comparable efficacy(10–12). Ivermectin seems to be most effective for large populations with high prevalence of scabies(10). However the use of ivermectin can lead to serious adverse events in patients with high concentration of *Loa Loa* microfilariae in the blood(13). Since *Loa Loa* is endemic in Gabon(14), treatment with ivermectin for Scabies should only be given if high Loa parasitemia can be excluded. Furthermore, only limited safety data exists for children under 5 years of age or weighing less than 15 kg, a group in which scabies is common(9).

Permethrin is the first line topical treatment for Scabies, however it comes at a higher cost per treatment, and is more difficult to obtain in Gabon than Benzyl Benzoate, a substance which also offers good efficacy and safety(10–12).

It is recommended that the contact persons of an affected individual shall also be treated at the same time, to ensure long term success of treatment, prevent reinfestation and infestation of contact persons(9,10,15). However this recommendation lacks a solid background of evidence. A recent review concluded that the effects of treating contact persons to prevent new infestation are unknown(16).

There is currently an outbreak of itching lesions suggestive of scabies in Gabon that the local population has named “gratti gratta” but there has been so far no raised attention from the local medical scientific community to describe these lesions and definitely attribute the diagnosis of scabies and sensitize the population in measure for the control of the epidemic.

Research question

We propose a randomized controlled trial comparing treatment of only affected persons presenting at our medical research center (which we will call individual treatment) to treatment of the entire household (which we will call household treatment), with both groups using the same treatment regimen with benzyl benzoate. We hereby aim to assess the practice of systematically recommending household treatment and if it provides a benefit for the index case by preventing reinfestation.

We will also assess the number of household members affected 4 weeks after treatment, by examining all household members that are present on the day of the visit. Since the presence of itching and skin lesions in a household with a diagnosed scabies case is known to be highly specific (15,17), we will also assess the number of probable scabies cases per household before and after treatment according to the judgment of the household responsible person. Cases identified this way will be defined as "probable" and cases identified through clinical diagnosis by a physician will be defined as "confirmed".

We will further assess clinical characteristics of Scabies and demographic factors associated with its appearance in Lambaréné, Gabon, and surroundings. Although similar studies have been conducted elsewhere, little is known about Scabies in Gabon. A better understanding of the demographic profile of persons affected by the disease can benefit future control of the disease.

Study Objectives (Aims)

Primary objectives

To compare the effectiveness of individual vs household treatment for persons affected by scabies.

Secondary objectives

To compare the effectiveness of individual vs household treatment in terms of proportion of household members affected after 4 weeks.

To describe the clinical presentation of scabies and demographic profiles of persons affected presenting at our medical research center in Lambaréné, Gabon.

To assess the tolerability and safety of benzyl benzoate.

Endpoints

Primary Endpoint

The primary efficacy outcome will be clinical cure after 4 weeks.

Secondary Endpoint

Secondary endpoints will include the rate of probable and confirmed scabies cases per household after 4 weeks.

Methods and Materials

Study Population

The study will be conducted at the Centre de Recherches Médicales de Lambaréné (CERMEL). Cases will be identified from patients presenting at the medical research center, which are mostly patients form screening activities conducted for malaria trials. All household members that present at the medical research center from a household with at least one case of scabies will be included. The first affected subject included of a household will be defined as the index case.

Sample size

Estimating a cure rate of 70% and 95% for individual vs. family treatment respectively we calculated a sample size of 35 affected subjects per group to provide a power of 80% with an alpha of 0,05.

When estimating that on average one additional household member affected will present at the medical research center alongside an index case, we will aim to include at least 35 different households.

Scabies Diagnosis and Data Collection

Subjects will be checked for lesions typical of scabies by a physician. The diagnosis of scabies will be made by clinical examination, a method of diagnosis which has been used in a number of other studies to diagnose scabies and has been shown to be highly sensitive and specific. Scabies will be defined as the presence of itching together with typical distribution of lesions, such as on the hands, wrists, elbows, axillae, knees, buttocks, genitalia in men, breast areolae in women, palms and soles in children under the age of two(18,19).

The lesions will be described in terms of location and spread on the body, itching and superinfection. A severity scale will be used classifying the cases into mild, moderate, severe and crusted according to the number of lesions counted. Photos of characteristic lesions and lesions of special interest will be taken. In case of lesions of unclear origin images will be assessed via a telemedical consultation by a dermatologist at the department of tropical medicine, Berhard Nocht Institute of Tropical Medicine, Hamburg, Germany and a recommendation on treatment will be given. Images will be sent pseudonymized to protect subject privacy.

In the course of this study we will assess the use of a low-cost videomicroscope for the diagnosis of scabies, a method which has previously shown promise as a cost-effective way to definitely attribute lesions to scabies infestation(20). Thus, all patients will be examined with such a videomicroscope.

Demographic data including age, sex and household size will be assessed.

Study treatment and follow up

For the treatment part of this study index cases will be randomized in either of two groups and subjects of the respective household will follow the randomization outcome of the index case. Randomization will be done in RedCAP. In the first group only subjects affected by scabies shall be treated. In the second group all persons living in the same household as the index case shall be treated, and treatment will be dispensed according to the number of household members stated by the household responsible person. For both groups the choice of treatment will be a single application of benzyl benzoate 25%, which shall be mixed with an equal quantity of water for older children and with 3 parts of water for infants. Subjects will be instructed on the use of the treatment and given a standardized leaflet with instructions, however the use of the treatment will not be supervised, making this an intervention conducted in a real world setting.

Subjects will be followed up after 4 weeks. At follow up visits the subjects will be questioned about the symptoms of scabies and any adverse events experienced and examined by a physician. Cure will be defined as the clinical improvement in lesions with no new lesions. All household members present at this visit will also be examined for scabies. Subjects and household members considered not cured or newly infested will be treated.

Safety

Benzyl Benzoate is generally safe to use for all persons, including infants and pregnant women. It is contraindicated only for persons with known hypersensitivity to benzyl benzoate, which will constitute an exclusion criterium. Adverse events include skin irritation and stinging sensation(21). In case of accidental ingestion subjects are requested to contact the principal investigator.

Ethical Considerations

To maintain randomization into the individual and household treatment groups and to avoid preferential withdrawal, loss to follow up, or spillover effects the informed consent process will be performed in a two step approach.

First all participants and/or parents/guardians (as applicable) shall be informed about all aspects of this clinical trial including the study medication. However, the respective intervention strategies (individual versus household treatment) will not be disclosed to the participants in the first step of the informed consent process. After randomization, only for the household treatment group, a person responsible for the household shall be informed about and agree to the treatment of the entire household.

The study will be conducted according to the ethical principles stated in the Declaration of Helsinki, the applicable guidelines for ICH-GCP, and the applicable laws and regulations of Gabon. Approval from the CERMEL ethics review committee will be acquired. The study will conducted in compliance with the study protocol.

Data

Data will be collected electronically in RedCAP using the online interface and the RedCAP mobile app for offline data collection.

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