

Original papers

Treatment of scabies, permethrin 5% cream vs. crotamiton 10% cream

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ABSTRACT. Scabies is one of the three most common skin disorders in children, along with tinea and pyoderma. The treatment of choice is still controversial. The aim of this study is to compare the efficacy of permethrin 5% cream vs. crotamiton 10% cream in the treatment of scabies. In total, 350 patients with scabies were enrolled, and randomized into two groups. The first group received permethrin 5% cream on two occasions with a one-week interval, while the second group received topical crotamiton 10% cream and were told to apply this twice daily for five consecutive days. The treatment was evaluated at intervals of 2 and 4 weeks, and the treatment was repeated if treatment failure was found at the 2-week follow-up. Two applications of permethrin 5 % cream provided a cure rate of 70% at the 2-week follow-up, which increased to 85% at the 4-week follow-up after repeating the treatment. Treatment with single applications of crotamiton 10% cream was effective in 45% of patients at the 2-week follow-up, which increased to 65% at the 4-week follow-up after this treatment was repeated. Two applications of permethrin 5% cream was as effective as single applications of crotamiton 10% cream at the 2-week follow-up. After repeating the treatment, permethrin 5 % cream was superior to crotamiton 10% cream at the 4-week follow up.

Key words: scabies, Permethrin 5% cream, Crotamiton 10% cream

Introduction

Scabies is a highly contagious skin condition that is caused by a mite that is so small it can only be seen with a magnifying glass or under a microscope [1,2]. The mite cannot live more than three days without a human host, but it can survive up to a month when living on a human [3,4]. The mite also lays eggs in human skin, which hatch and grow into adult mites. This means that symptoms of the condition can last for months or even years [5,6]. It can be spread by scratching an infected area, thereby picking up the mites under the fingernails, or through physical contact with a scabies-infected person for a prolonged period of time [7,8]. Scabies is usually transmitted by direct skin-to-skin physical contact [9,10]. It can also be spread through contact with other objects, such as clothing, bedding, furniture, or surfaces with which a person infected with scabies might have come in contact [11,12]. Scabies mites can survive without a human host for 24 to 36 hours [13,14]. As with lice, scabies can be transmitted through sexual intercourse even if a latex condom is used, because it is transmitted from skin-to-skin at sites other than the sex organs [15]. Scabies can only be cured with prescription creams, lotions, or pills [16,17]. Nonprescription medicines are not strong enough to kill the mites. Most creams or lotions are applied to the entire body from the neck down [18]. In the case of infants, the medicine is also applied to the scalp, face, and neck, taking care to avoid the area around the mouth and eyes. The medicine usually is left on for 8 to 14 hours and then washed off [19]. Anyone who is diagnosed with scabies, as well as his or her sexual partners and other contacts who have had prolonged skin-to-skin contact with the infested person, should be treated [20,21]. Treatment is recommended for members of the same household as the person with scabies, particularly those persons who have had

prolonged skin-to-skin contact with the infested person. All persons should be treated at the same time to prevent reinfestation [22,23]. Crotamiton lotion or cream is approved for use in adults with scabies. Treatment failures with this drug are more common than with ivermectin [24,25]. The first-line drug for scabies continues to be 5% permethrin cream. It has low toxicity and excellent results. Permethrin should be washed off after 8–14 hours and the application repeated 1–2 weeks later if live mites are seen. The cream should be washed off in 8–9 hours in children less than 6 years, but can be left on for up to 12–14 hours for older children [26,27]. One dose is usually curative. The aim of this study was to compare the efficacy of permethrin 5% cream vs. crotamiton 10% cream in the treatment of scabies.

Materials and Methods

This study was approved by the ethics committee of Tabriz University of Medical Sciences. Informed consent was obtained from the patients or their parents.

Patient recruitment. This was a single-blind, randomized controlled trial. Between October 2009 and October 2012, any patients with scabies who were older than 2 years of age and attending the Dermatology outpatient department of Sina Hospital, Tabriz University of Medical Sciences were assessed for enrolment in the study. The exclusion criteria were an age younger than 2 years; presence of pregnancy or lactation; a history of seizures, severe systemic disorders, immunosuppressive disorders and the presence of Norwegian scabies; and the use of any topical or systemic acaricide treatment for 1 month before the study. Before entry into the study, patients were given a physical examination and their history of infestations, antibiotic treatment and other pertinent information was recorded. Age, gender, height and weight were recorded for demographic comparison, and photographs were taken for later clinical comparison. None of the patients had been treated with pediculicides, scabicides or other topical agents in the month preceding the trial. The diagnosis of scabies was made primarily by the presence of the following three criteria: presence of a burrow and/or typical scabietic lesions at the classic sites of infestation, report of nocturnal pruritus and history of similar symptoms in the patient's families and/or close contacts. Infestation was confirmed by detection of eggs, larvae, mites or fecal material under light microscopy. Patients who satisfied the above criteria were randomly divided into two groups: group A were to receive permethrin 5% cream, and group B were to receive crotamiton 10% cream.

Randomization and treatment. In total, 450 patients were initially enrolled. Of these, 50 patients were not able to return after the first follow-up examination, and were therefore excluded from the study. The remaining 350 patients (200 male, 150 female; mean ± SD age 42.86 ± 12.54 years, range 4–72) constituted the final study population. The first group received permethrin 5% cream on two occasions with a one-week interval, while the second group received topical crotamiton 10% cream and were told to apply this twice daily for five consecutive days. The treatment was given to both patients and their close family members, and they were asked not to use any antipruritic drug or any other topical medication.

Evaluation. The clinical evaluation after treatment was made by experienced investigators who were blinded to the treatments received. Patients were assessed at 2 and 4 weeks after the first treatment. At each assessment, the investigators recorded the sites of lesions on body diagram sheets for each patient, and compared the lesions with those visible in the pretreatment photograph. New lesions were also scraped for microscopic evaluation. Patients were clinically examined and evaluated based on the criteria defined in the 'Patient recruitment' section above. 'Cure' was defined as the absence of new lesions and healing of all old lesions, regardless of the presence of postscabetic nodules. 'Treatment failure' was defined as the presence of microscopically confirmed new lesions at the 2-week follow-up. In such cases, the treatment was repeated at the end of week 2 and patients were evaluated again at week 4. 'Re-infestation' was defined as a cure at 2 weeks, but with the development of new lesions with positive microscopic findings at 1 month. Any patients with signs of scabies (whether as a result of treatment failure or re-infestation) would then be treated with oral ivermectin.

Statistical analysis. The c_{ι} test or the Fisher exact test was used, as appropriate, to examine the differences between groups, and $P<0.05$ was considered significant. SPSS software (version 16; SPSS Inc., Chicago, IL, USA) was used for all analysis.

Results

There were no significant differences in age or gender between the two groups (Table 1). On entry into the study, the numbers of patients in each treatment group who were graded as having mild, moderate or severe infestation were also not significantly different (Table 2).

Table 1. Demographic characteristics of the study population

	Permethrin	Crotamiton
	(n=175)	(n=175)
Age	38.68±14.74	35.37±12.29
Sex		
Male	100	100
Female	75	75
Height (cm)	173±23	170±27
Weight (kg)	77±16	71±16

At the 2-week follow-up, the treatment was effective in 140 (70%) patients in the permethrin 5% cream group and 90 patients (45%) in the crotamiton 10% cream, with no significant difference between the groups (P=0.56). The treatment was repeated for the 170 patients (95 male, 75 female; 60 in the permethrin 5% cream and 110 in the crotamiton 10% cream group) who still had signs of infestation.

At the second follow-up, at 4 weeks, only 30 of the 60 patients in the permethrin 5% cream group still had severe itching and skin lesions, compared with 70 of the 110 patients in the crotamiton 10% cream group. Hence, the overall cure rate was 170/200 patients (85%) in the permethrin 5% cream group and 130 of 200 (65%) in the crotamiton 10% cream group (P<0.05).

The remaining 100 patients who were considered treatment failures in the study were retreated with open-label oral ivermectin, which cured the infestation in 2–3 weeks.

Table 2. Severity of infestation of all patients before treatment

Lesions	Permethrin	Crotamiton	Total subjects
Mild <50	25	35	60
Moderate 50-100	60	30	90
Severe > 100	90	110	200
	n=175	n=175	350

Adverse events. The treatments were considered cosmetically acceptable by both patients and parents. None of the 360 participants experienced allergic reactions. The main adverse event (AE) was irritation, reported by 50 patients (20 in the permethrin 5% cream group and 30 in the crotamiton 10% cream group), but this was not serious and did not affect compliance. None of the patients experienced worsening of the infestation during the study; even the treatment failures were improved compared with their pretreatment status, and none had > 50 new lesions.

Discussion

Prescription medicated creams are commonly used to treat scabies infections. The most commonly used cream is permethrin 5%. Other creams include sulfur in petrolatum, and crotamiton [28,29]. Permethrin cream (5%) was introduced in 1989 for the treatment of scabies and seems to be a good substitute for other medications. It is considered to be the drug of choice in many countries. It is a synthetic compound based on the insecticidal components of naturally occurring permethrins [30,31]. The 5% permethrin preparation kills organisms and eggs, and has an extremely low rate of absorption, making the toxicity potential nonexistent. Weekly applications have been extremely successful in preventing reinfection. It is probably the most reliable topical scabicide. However, resistance to permethrin in developed countries was reported in 1999 [32,33].

Crotamiton is a topical drug used in the treatment of scabies and pruritus [34,35]. Our study, however, compared the use of permethrin with that of crotamiton 10% cream in the treatment of scabies. This study demonstrated that permethrin was as effective at treating scabies as crotamiton 10% cream at a two-week follow up, and this is in accordance with previous studies that have reported excellent cure rates with permethrin [36,37]. Permethrin treatment yielded higher healing rates than the topical treatment 30 days after the initial treatment.

Although the persistence of pruritus in scabies for several weeks after cure is not uncommon and is not necessarily predictive of treatment failure, since it is the primary symptom of scabies, a drug with a more rapid effect on relieving pruritus is much more acceptable to patients [38,39]. In a study carried out

by Usha et al., [40] a higher number of patients showed clearance of lesions as compared to our results, which could be explained by the longer follow-up time. The results show that both permethrin and crotamiton are effective in preventing recurrences of scabies over a period of 2 months. In the study carried out by Khan et al. [41] a 100% cure was seen in both treatment groups, possibly because firstly, the study was carried out on a smaller number of patients with a follow up of 2 weeks and secondly, their ages were 12 years or above, when the activity of sebaceous glands is greater. There are some reports that complete clearance of lesions occurs earlier in permethrin-treated patients and it may be the case that the better response to permethrin seen in the present study is partially related to its properties in reducing pruritus.

This study confirms that permethrin is more effective than crotamiton for the treatment of human scabies, allowing a fast and safe cure of this condition through a simple administration. The treatment of scabies with permethrin then becomes an effective resource to control infestation in confined populations and, more generally, for medical plans to eradicate human scabies.

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