

An interventional study to assess the safety and efficacy of oral ivermectin compared to topical Permethrin for the treatment of Scabies

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Abstract

Background: Scabies is a highly contagious disease of the skin that is caused by *Sarcoptes scabiei* which is an ectoparasite. Two commonly used drugs for its treatment are oral ivermectin and topical permethrin and these are thought to be more effective than all the other drugs that had been previously used for the treatment of Scabies. **Objective:** The present study aims to the comparison of safety and efficacy of topical permethrin and oral ivermectin to treat scabies. **Study design:** A randomized controlled trial **Place and Duration:** This multi centric study was conducted in multiple dermatology centers of Saudi Arabia from June 2021 to June 2022 **Methodology:** This study was conducted in various dermatology outpatient department of the country. A total of 110 patients were included in the study. The age of the patients ranged from 2 years to 60 years. Participants were selected from both genders. All the participants were equally divided into two groups, group A and group B. Group A was administered oral ivermectin in a single dose of 200 µg/kg and group B was administered topical permethrin 5% cream. The patients in group B were instructed to use the lotion on the whole body and leave the lotion for 12 hours. The patients were observed and if the given treatment did not work, a second dosage of the same treatment was given by the administration of the respective drug. Patients were called for followed up after two and four weeks of initial treatment. **Results:** A total of 48 (87.27%) of the 55 patients in group A, which was given oral ivermectin treatment, showed complete clearance of scabietic lesions as observed after four weeks of treatment. On the other hand, 43 (78.18%) of the 55 patients in group B that was treated with topical permethrin showed recovery. The difference was not significant ($p=0.15$). However, 9 (16.36%) patients in group A complained of side effects of oral ivermectin such as headache, secondary bacterial infection, and increased itching. Whereas, no such side effect was seen in group B. There was a significant difference in the side effects of both drugs ($p<0.05$). **Conclusion:** Overall, permethrin and ivermectin are equally effective in the treatment of scabies. Oral ivermectin can have side effects sometimes.

Keywords: Scabies, ivermectin, permethrin, itching, side effects

Introduction

Sarcoptes Scabiei is known as the most common parasite found on the skin of human beings. The infection caused by these mites is called Scabies [1]. The parasite causes a pruritic rash with intense itching. The infection is highly contagious and is capable of affecting people of all ages and all genders [2]. The itching is more prominent in burrows and inflammatory papules are formed followed by itching [3]. The itching is felt more extremely at night and in warm temperatures [4]. There is no known way by which the infection or

transmission of infection from one person to another person can be prevented. However, there are various treatment options for Scabies including topical drugs such as Sulphur, Malathion, permethrin, monosulfiram, benzyl benzoate, crotamiton, and lindane [5]. Out of all these, the most effective topical regime is treatment by Permethrin. It is also admitted to being the safest drug compared to other drugs that had been used previously [6].

Oral ivermectin is another drug that is structurally similar to macrolides. It is also used for onchocerciasis and strongyloidiasis. It has recently been used for the treatment of scabies as a single dose of 200 µg/kg and the dose is repeated at the

interval of two weeks until full recovery [7]. The benefit of the drug is that poor compliance can be avoided. Also, the application of a topical drug from head to toe is difficult for patients, especially mentally retarded patients, and bedridden patients [8]. Some of the common side effects of oral ivermectin are headache, fever, myalgia, arthralgia, hypotension, lymphadenopathy, and tachycardia. Other serious complications a patient can rarely develop are prolonged prothrombin time, elevated liver enzymes, and transient ECG [9].

The present study compares the safety and efficacy of topical permethrin with oral ivermectin in the treatment course of Scabies.

Methodology

The present study is an interventional study that included 110 patients. The patients were both male and female and the age ranged from two years to sixty years. As per the inclusion criteria of the study, the patients who were already immunocompromised, lactating mothers, pregnant, and having any other skin disease or infections (fungal or bacterial), were not added to the study. A proforma was completed by all the patients. Written informed consent was taken from all the patients. Consent for children was taken from their parents.

A detailed history was taken from all the patients and all the patients were examined for scabies pustules. After the history taking and examination, the patients were randomly divided into two groups, group A and group B. The patients in group A were administered a single dose of ivermectin by calculation of dosage. The dosage of ivermectin is 200 µg/kg. The patients in group B were prescribed topical permethrin 5% lotion. The patients were instructed to apply the lotion on the whole body and leave for 12 hours. The patients who did not respond to one dosage were examined after two weeks and the second dosage was given.

The patients were called for follow-up after 2 and 4 weeks. The papules and burrows were examined on each follow-up. All the baseline investigations of the patients were also carried out to see eosinophils, prothrombin time, leukocyte count, and ALT. Pruritus was graded as severe, moderate, and mild according to sleep disturbance reported by the patients.

The effectiveness of the treatment was evaluated by the presence or absence of itching, microscopy of

mites, and clearance of skin lesions. The safety of the drug was found out by the presence of headache, myalgia, tachycardia, arthralgia, hypotension, and baseline investigations for ivermectin. For permethrin, the safety was determined by observing erythema, burning, and stinging.

Results

A total of 110 patients were added to the present study and they were divided into two groups 55 patients in each group. The age, gender, and family history of the disease have been given in table 1. It can be seen from table 1 that most of the patients had a positive family history of the disease. Table 2 shows the characteristics of the disease in the patients after administration of the treatment on the first visit and both follow-ups. On the second follow-up after two weeks after the first visit, 23 (41.81%) patients in group A and 24 (43.63%) patients in group B were cured (p=0.5). All the patients who had lesions on the first follow-up visit were given the treatment again. More improvement was seen on the second follow-up visit in the fourth week. A total of 48 (87.27%) patients in group A and 43 (78.18%) in group B completely recovered. Nocturnal pruritus and microscopic findings regarding mites had also improved in both groups. There was no significant difference in the improvement of all the symptoms (p=0.157).

Only one patient in group B reported erythema, stinging, and burning. However, 9 (16.36%) patients in group A complained of side effects of oral ivermectin such as headache, secondary bacterial infection, and increased itching. The difference between the side effects of both groups was significant (p<0.05).

Table 1. Distribution of age, gender, and family history in group A and group B

Variable	Group A (oral ivermectin)N=55	Group B (topical permethrin)N=55
Age distribution2-2021-4041-60	22 (40%)19 (34.55%)14 (25.45%)	24 (43.63%)18 (32.72%)13 (23.63%)
GenderMaleFemale	24 (43.63%)31 (56.36%)	35 (63.63%)20 (36.36%)
Family historyPositiveNegative	38 (69.09%)17 (30.9%)	39 (70.9%)16 (29.09%)

Table 2. Characteristics of the disease in patients on the first visit and on follow-up visits

Characteristics	Group A (oral ivermectin)N=55			Group B (topical permethrin)N=55		
	First Visit	Two weeks	Four weeks	First Visit	Two weeks	Four weeks
LesionsNilMildModerateSevere	0031 (56.36%)24 (43.63%)	23 (41.81%)22(40%)9(16.36%)1(1.82%)	48 (87.27%)7 (12.72%)00	05(9.09%)28(50.90%)22(40%)	24 (43.63%)21 (37.18%)8 (14.54%)2(3.63%)00	43 (78.18%)12 (21.81%)00
Nocturnal pruritusMildModerateSevere	018 (32.72%)37 (67.27%)	15 (27.27%)28 (50.90%)12 (21.82%)	34 (61.82%)21 (38.18%)0	019(34.54%)36 (64.45%)	16 (29.09%)26 (47.27%)13 (23.63%)0	35 (63.63%)20 (36.36%)0
Scraping microscopy for mitesN/APositiveNegative	46(83.63%)5(9.09%)4(7.27%)	47(85.45%)08(14.54%)	55(100%)00	47(85.45%)08(14.54%)	48(87.27%)07(12.72%)	55(100%)00

Discussion

The present study suggests that the outcomes of treatment with ivermectin and permethrin have no significant difference. The study of Usha et al shows similar results compared to the present study. Our studies show that treatment with ivermectin cured most of the patients by the second week. According to the study of Usha et al, the first application of permethrin was more effective compared to ivermectin. The first dose of permethrin cleared most of the lesions [10]. A comparative study was conducted by Rosumeck et al in which they included fifteen studies regarding the treatment of Scabies. Their results were similar to the present study concerning the duration of the cure. They concluded that the time taken by permethrin for the treatment of scabietic lesions was one week, whereas, oral ivermectin took more time. Regarding the adverse effects of the treatment, both drugs did not show any serious side effects [11]. The results related to the safety of drugs were not comparable to the present study.

Goldbust et al conducted a study to compare the efficacy of oral ivermectin and topical permethrin. They included 200 patients in their study. Their study method was similar to the study method of the present study. They divided the patients into two groups and administered each drug in each group. They concluded that the application of permethrin twice a week is more effective than administering oral ivermectin once a week [12]. In a similar study conducted by Dhana et al, they observed that oral ivermectin was lesser effective than topical permethrin. Due to a smaller sample size, there is an issue with reliability [13]. According to the study of Bachewar et al, oral ivermectin can bring better results if it is given with a topical drug. They administered ivermectin, permethrin, and benzyl benzoate to three groups of patients. They observed that two doses of ivermectin were more effective than permethrin. They also suggested administering benzyl benzoate and ivermectin are more cost-effective [14].

Conclusion

Both ivermectin and permethrin are effective in the treatment of scabies. However, ivermectin is easy to administer as it needs only a single dosage and there is no fear of poor compliance. Moreover, ivermectin is more cost-effective. The safety of permethrin use is more compared to ivermectin. Ivermectin can cause side effects such as headache, fever, tachycardia, dizziness, and lymphadenopathy.

Funding source

None

Conflict

No conflict of interest

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