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**ORIGINAL ARTICLE**

# Comparison of Efficacy of Topical Permethrin vs Oral Ivermectin in Scabies

KALSOOM ASLAM[1], SARAH RIAZ KHAN[2], AMNA BEGUM[3], ASGHAR ALI MEMON[4], FAROOQ AZAM KHAN[5], HAFSA USMAN[6]
[1]*Assistant Professor, Dermatology Department, Kuwait Teaching Hospital, Peshawar*
[2]*Assistant Professor Naseer Teaching Hospital, Peshawar*
[3]*Assistant Professor, Pir Sayed Abdul Qadir Shah Jilani Institute of Medical Sciences, Gambat*
[4]*Assistant Professor, Department of Community Medicine GMMMC, (SMBBMU), Larkana*
[5]*HOD Dermatology, Naseer Ullah Khan Babar Memorial Hospital, Peshawar*
[6]*Senior Registrar, Dermatology Department, Kuwait Teaching Hospital Peshawar*
*Correspondence to: Hafsa Usman, Email: dr.hafsausman@gmail.com*

## ABSTRACT

**Background:** Sarcoptes scabiei var. homoinis is the common cause of scabies. A number of ectoparasites and endoparasites can be effectively combated using the antiparasitic drug ivermectin orally. Permethrin is a pesticide when administered topically, destroys the scabies causing mite and their eggs.

**Objective:** To evaluate the effectiveness of topical permethrin and oral ivermectin in the management of scabies.

**Methods:** The current study was carried out at the department of dermatology, Kuwait Teaching Hospital Peshawar for a period of six months from January 2023 to June 2023. After the informed consent, the hundred recruited patients were divided into two groups for the randomized controlled experiment. On day zero, all the 50 patients in group B received topical permethrin 5% treatment, whereas all 50 cases in group A received oral tab Ivermectin at a dosage of 200 mcg/kg. For comparison, clinical and itch grading scores were used as tools. SPSS version 23 was used for statistical analysis.

**Results:** Patients who got oral Ivermectin had a mean age of 39.79 ±11.48 years, whereas those who received permethrin 5% had a mean age of 40.57±11.25 years. There were 26 (52 %) cases of effectiveness (p value<0.05) in the Ivermectin group compared to 43 (86%) cases in the permethrin 5% group. Permethrin (5%) continued to be more effective.

**Conclusion:** Permethrin 5% compared to Ivermectin can be used to treat scabies in order to increase cure rates against scabies.

**Keywords:** Efficacy; Topical permethrin; Oral Ivermectin; Scabies

## INTRODUCTION

The mite Sarcoptes scabiei var. hominis is the cause of the widespread ectoparasitic infection known as scabies. The skin infection caused by the arthropod is extremely itchy and highly infectious, affecting people of various ages and socioeconomic backgrounds[1,2]. Burrows, severe itching, and a broad eruption of inflammatory papules are the main characteristics. When the patient is warm at night, the itching usually gets worse[2]. Even after all this time, there is still no proven technique to stop scabies from spreading. Topical medications such as sulfur, benzyl benzoate, malathion, crotamiton, monosulfiram, and lindane are among the available therapy options[3,4].

Because topical permethrin is safer and more effective than previously used medicines, it is utilized presently[5,6]. The new medication ivermectin shares structural similarities with macrolide antibiotics. Strongyloidiasis and onchocerciasis have been officially treated with it since its discovery in 1975. Scabies is now being treated with it as well. A single dosage of 150–200 µg/kg body weight is effective, or it can be repeated every two weeks. The benefits include greater compliance and a single dosage in resistant infestations and situations where it is logistically challenging to apply topical treatment head to toe, such as in cases of mentally retarded individuals or large-scale institutional epidemics[7] Fever, arthralgia, myalgia, headache, dizziness, hypotension, tachycardia, and lymphadenopathy are among the adverse effects that have been reported. Additionally it is noted that of prolonged prothrombin time, brief ECG variations, and altered liver enzyme levels [8]. We examined and compare the effectiveness and safety of topical permethrin 5% and oral ivermectin in treating scabies in the current research.

## METHODOLOGY

The current study was carried out at the department of dermatology, Kuwait teaching hospital Peshawar for a period of six months from January 2023 to June 2023. Initially, 116 patients were involved in the randomized controlled study; of those, 16 were removed due to inadequate follow-up, and the remaining 100 patients underwent thorough investigation, approved by the hospital's ethics committee and obtained informed permission from patients. According to the operational criteria, all patients were male and female between the ages of 18 and 65, with clinical diagnoses of mild to severe scabies. Scabies: individuals with microscopic examination for at least six months have a widespread itch that is worse at night and typical lesions in typical locations.

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**Pruritus Assessment:** The patient was asked to rate their level of pruritus on a visual analogue scale (VAS) score ranging from 0 to 10. Scabies severity was assessed using a lesion count score ranging from 0 to 3, with 0 denoting no scabies, 1 representing 10 or less lesions (mild), 2 representing 11 to 49 lesions (moderate), and 3 representing“50 or more lesions (severe). Patients with a history of topical therapy for scabies within the last six weeks, those on topical or systemic antibiotic therapy a week before the study, patients with compromised immune systems, those with crusted scabies or scabies incognito, those allergic to permethrin or ivermectin, and expectant or nursing mothers were not allowed to participate. By means of a lottery, patients were divided into two groups, A and B, with 50 patients each. On day zero, all cases in group B received topical permethrin 5% along with a printed information leaflet, whereas all cases in group A received oral ivermectin at a dose of 200 mcg/kg. They were told to wash it with warm water in the morning after applying it overnight. After a week, the patients were contacted for a follow-up visit to check on compliance and to conduct an evaluation.”

**Effectiveness:** It was assessed in terms of negative microscopy and full clinical cure, which was defined as a 50% or more decrease in the number of lesions and the grade of pruritus (i.e., moderate to good improvement). The main goal was to heal from scabietic sores. The patients underwent examinations in order to compare the itching grading score with the baseline clinical grading score. Antihistamines were administered for a further week to patients who received appropriate treatment if their pruritis was moderate or severe, but not for minor itching.

SPSS version 23 was used for statistical analysis. Every quantitative information, including age and illness duration, was displayed as mean ± SD. Every qualitative piece of information, including gender and treatment effectiveness, was expressed as

frequency (%).Data were categorized according to age, gender, illness duration, and baseline severity. To ascertain efficacy in both groups, the chi-square test was used, with a p-value of ≤0.05 being considered significant.

## RESULTS

The study population's mean age was 39.56±10.45 years, whereas patients in the permethrin 5% group had a mean age of 40.57±11.25 years and those in the oral ivermectin group had a mean age of 39.79 ±11.48 years. There were 20 male and 30 female cases in the permethrin 5% group and 23 male and 27 female cases in the oral ivermectin group (Figure 1).

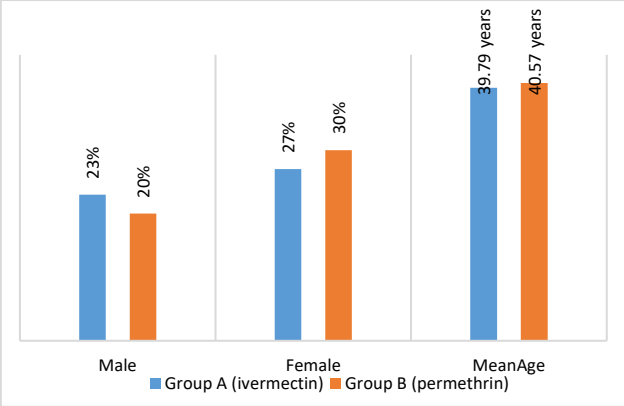


Figure 1: Mean age and gender of patients from both groups

Permethrin 5% group efficacy was statistically greater than oral ivermectin group efficacy, p-value <0.05 (Table 1).

Table 1: Efficacy Comparison in both groups

| Efficacy | Study groups | | P-value |
|---|---|---|---|
| | Permethrin 5 % | Oral Ivermectin | |
| Yes | 43 (85%) | 27 (54%) | |
| No | 7 (14%) | 23 (46%) | |
| Total | 50 (100%) | 50 (100%) | 0.007 |

The oral ivermectin group experienced a mean length of illness of 12.01 ±2.97 months, whereas the permethrin 5% group saw a mean duration of 11.52 ±3.12 months. In the group treated with permethrin 5%, 43 cases (86%) showed efficacy, whilst 7 (14%), had no efficacy at all. Similarly, in the group treated with oral ivermectin, 26 cases (52%), showed efficacy, while 24 cases (48%), showed no efficacy. Permethrin 5% group had a statistically larger frequency of effectiveness in cases with 7–12 months (86%) compared to the oral ivermectin group (52%), with a p-value <0.05 (Table 2).

Table 2: Efficacy Comparison in both groups based on duration

| Efficacy 7-12 months | Study groups | | P-value |
|---|---|---|---|
| | Permethrin 5 % | Oral Ivermectin | |
| Yes | 43(86%) | 26(52%) | |
| No | 7 (14%) | 24 (48%) | 0.004 |

Table 3: Efficacy Comparison in both groups based on disease severity

| Severity /efficacy | Study Groups | | P-value |
|---|---|---|---|
| | Permethrin 5 % | Oral Ivermectin | |
| Mild | | | |
| Yes | 8 (80%) | 13 (87.5%) | 0.034 |
| No | 2 (20%) | 3 (22.5%) | |
| Moderate | | | |
| Yes | 21 (84%) | 21 (84%) | 0.033 |
| No | 4 (16%) | 4 (16%) | |
| Severe | | | |
| Yes | 13 (87.5%) | 8 (80%) | 0.035 |
| No | 3 (22.5%) | 2 (20%) | |

Permethrin 5% group showed a statistically greater frequency of effectiveness than the oral Ivermectin group in cases with mild, moderate, and severe illness at baseline (p-value <0.05), as shown in Table 3.

## DISCUSSION

Sarcoptes scabiei var. hominis is a mite that causes scabies, a common ectoparasitic ailment. After scabies, secondary infections frequently occur, and post-infective acute post-streptococcal glomerulonephritis is a known consequence. In the current trial, 86% of the permethrin 5% group showed effectiveness, compared to 52% of the oral ivermectin group.

In a previous study, three groups were given different treatments: either 5% permethrin, oral ivermectin single dose (200 µg/kg/dose), or oral ivermectin (200 µg/kg/dose) given twice a week. A week after treatment, the group receiving 5% permethrin showed the greatest cure rate, at 94.7%. Nevertheless, all three regimens continued to be effective[9]. Therefore, parallels with the findings of the current study were observed. A research conducted on sixty scabies patients, evaluated the safety and effectiveness of oral ivermectin vs permethrin 5% lotion. One group had oral ivermectin stat and repeated after 14 days, showing 92.8% efficacy, whereas the other utilized 5% permethrin lotion twice at 7-day intervals, with 96.9% effectiveness. Patients treated with permethrin recovered sooner[10]. Similarly, Golddust M. et al. conducted a research on 240 individuals. In one of the groups, an ivermectin single dosage resulted in an 85.9% cure rate at a 2-week interval. A one-week gap between the two permethrin applications proved beneficial in 92.5% of the patients in the other group. Yet again, those treated with permethrin recovered earlier. Permethrin applied twice at a week's interval proved more effective than ivermectin used once[11] In a similar manner, 315 patients participated in a similar study to evaluate topical permethrin, oral ivermectin, and topical ivermectin during a four-week period. By the end of the first week, 69.3% of patients had recovered from topical ivermectin, 30% of patients had recovered from oral ivermectin, and 74.8% of patients had received treatment with permethrin (P<0.05). Nevertheless, after three weeks, 100% of patients in the groups treated with permethrin and topical ivermectin and 99% in the group treated with oral ivermectin (P=0.367), indicating that the former proved to be more successful than the latter. Another effective treatment for scabies is topical ivermectin[12].

In a quasi-experimental local research, 100 patients' safety and effectiveness were evaluated between the two medications. A single dosage of 200 µg/kg body weight was administered to Group A. Patients in Group B used 5% permethrin lotion on their entire body at night for 12 hours. If there was no improvement after two weeks, they used the same medication for a second treatment. After four weeks of treatment, permethrin showed somewhat superior effectiveness (88.1%) in eliminating scabies than ivermectin (79.5%), however the results were statistically insignificant (P=0.15). Permethrin group saw less side effects than ivermectin group, though[13]. synthetic pyrethroid methrin possesses insecticidal properties and a very minimal potential for toxicity towards mammalian cells[14]. Many parasitic infections are treated with ivermectin. It is safe to use on people and is utilized in the veterinary and agricultural industries[15]. Additionally, it works well against head lice infestations, which frequently coexist with scabies cases[16].

## CONCLUSION

Permethrin 5% compared to ivermectin can be used to treat scabies in order to increase cure rates against scabies.

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