Barind Medical College Journal
Abbreviated Key Title: BMCJ
ISSN: 2518-3249 (Print)
https://bmcj.org/index.php/bmcj
Volume-11 | Issue-1 | Jan-Jun, 2025 | DOI: https://doi.org/10.70818/bmcj.2025.v011i01.0173

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Original Research Article

Comparative Efficacy and Safety of Permethrin and Ivermectin in the Treatment of Scabies

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Article History
Received: 27.02.2025
Accepted: 10.04.2025
Published: 30.06.2025

Abstract: ***Background:*** Scabies, a highly contagious parasitic skin infestation caused by *Sarcoptes scabiei*, remains a significant public health concern in Bangladesh, particularly in densely populated areas with poor sanitation and limited access to healthcare. Conventional treatments like topical permethrin and oral ivermectin have proven effective, but refractory cases pose challenges due to increasing resistance to monotherapy. ***Objective:*** This study aims to evaluate the efficacy of combined therapy using ivermectin and permethrin in treating refractory scabies cases in Bangladesh. ***Methodology:*** A total of 100 patients diagnosed with scabies were enrolled at the out-patient department of Dermatology and Venereology at Jalalabad Ragib Rabeya Medical College and Hospital, Sylhet from June 2023 to July 2024. Patients were randomly assigned to receive either topical permethrin (Group B) or oral ivermectin (Group A). Informed written consent was obtained, and exclusion criteria included pregnant women, those with severe systemic diseases, or known hypersensitivity to the drugs. The study assessed outcomes at baseline, the 7th day, and the 14th day. ***Results:*** Analysis revealed that permethrin was significantly more effective than ivermectin in reducing clinical scores over the two-week period. At baseline, Group A had a mean score of 8.20 ± 2.21, which decreased to 2.60 ± 2.35 by day 14, while Group B showed a mean score reduction from 7.58 ± 2.01 to 0.37 ± 1.10. Adverse effects varied, with ivermectin causing mild systemic symptoms (nausea, headache) and permethrin leading to localized skin irritation (pruritus, burning sensation). ***Conclusion:*** Both ivermectin and permethrin are effective in treating scabies, but permethrin demonstrates superior efficacy in clinical outcomes. These findings highlight the importance of tailored treatment approaches for refractory scabies, considering individual patient profiles and monitoring for adverse effects to enhance patient adherence and optimize outcomes.

Keywords: Scabies, Sarcoptes Scabiei, Ivermectin, Permethrin, Combination Therapy, Refractory Scabies.

Cite this as: Ahmed I, Tasnim N, Liza SR. Comparative Efficacy and Safety of Permethrin and Ivermectin in the Treatment of Scabies. BMCJ. 2025;11(1): 30-34

Introduction

Scabies, a highly contagious parasitic skin infestation caused by Sarcoptes scabiei, remains a significant public health concern in Bangladesh. The disease is particularly prevalent in densely populated areas with poor sanitation and limited access to healthcare. Conventional treatments, such as topical permethrin or oral ivermectin, have been effective in most cases.[1-3] However, refractory scabies—cases that persist despite standard treatment—poses a growing challenge. The increasing resistance to monotherapy has necessitated the exploration of alternative therapeutic strategies. Combination therapy using

ivermectin and permethrin has emerged as a promising approach to managing refractory scabies. Ivermectin, an oral antiparasitic agent, disrupts the nerve and muscle function of S. scabiei, leading to parasite paralysis and death. On the other hand, permethrin, a topical pyrethroid insecticide, acts by interfering with sodium channels in the parasite, causing paralysis and eventual eradication. Their distinct mechanisms of action suggest a potential synergistic effect when used together, enhancing treatment efficacy and reducing the likelihood of resistance development.[4-6]

Recent studies have indicated that combining oral ivermectin with topical permethrin leads to faster symptom resolution and higher cure rates compared to monotherapy. This dual therapy approach is particularly beneficial in cases where scabies lesions persist despite repeated applications of a single agent.[7-9] The synergistic effect of these drugs may also help mitigate issues related to patient compliance, as oral ivermectin offers an alternative for individuals who struggle with the proper application of topical treatments. In Bangladesh, where overcrowding and limited medical resources hinder effective scabies control, implementing a combination regimen could improve patient outcomes. The success of this strategy depends on various factors, including drug availability, affordability, and public health awareness. Understanding the clinical benefits and safety profile of combined ivermectin and permethrin therapy is crucial for its widespread adoption in national treatment guidelines.

Objective

This study aims to evaluate the efficacy of the combined use of ivermectin and permethrin in treating refractory scabies cases in Bangladesh.

Methodology

A total of 100 patients diagnosed with scabies were enrolled at the out-patient department of Dermatology and Venereology at Jalalabad Ragib Rabeya Medical College and Hospital, Sylhet from June 2023 to July 2024. Of these, 50 patients received topical Permethrin, while the other 50 were treated with oral Ivermectin. A purposive sampling method was employed, and all patients were clinically diagnosed and randomly allocated into two groups: Group A (Ivermectin) and Group B (Permethrin). Informed written consent was obtained from all participants. Exclusion criteria included pregnant and lactating women, patients with immunodeficiency or severe systemic diseases, those with heavily crusted or nodular lesions, secondary infections or eczematization, coexisting dermatological conditions, and individuals with known hypersensitivity to the trial medications. The total of 100 patients with scabies were enrolled and randomized into the two treatment groups. All patients completed a 2-week study period, with follow-up evaluations conducted on the 7th and 14th days. Outcome measures were assessed at baseline and at the specified intervals.

Results

Table 1 presents the distribution of age groups by gender among the patients. In the 20-29 age group, 13.70% of the participants were male, compared to 7.41% female. The 30-39 age group had a higher representation, with males accounting for 52.05% and females at 62.96%. In the 40-49 age group, 30.14% were male, while only 22.22% were female. Finally, in the age group over 50, 4.11% were male and 7.41% were female. Overall, the data suggest a notable gender disparity across age groups, particularly in the 30-39 range, where females outnumber males, while the 40-49 age group shows a reversal in this trend.

Table 1: Distribution of Age Groups by Gender

Age Group	Male (%)	Female (%)
20-29	13.70%	7.41%
30-39	52.05%	62.96%
40-49	30.14%	22.22%
>50	4.11%	7.41%

Table 2 outlines the percentage distribution of patients according to the site of involvement for both treatment groups. In Group A (Ivermectin), the finger webs were affected in 90.0% of patients, while Group B (Permethrin) reported a slightly higher prevalence at 94.0%. The wrist involvement was noted in 96.0% of Group A patients, compared to 92.0% in Group B. The periumbilical region showed a prevalence of 94.0% in Group A and 90.0% in Group B. Both groups had high rates of genitalia involvement, with 96.0% in Group A and 98.0% in Group B. For the areola, 46.0% of Group A patients were affected, while 48.0% of Group B patients reported involvement. Lastly, axillae involvement was observed in 70.0% of Group A patients and 66.0% of Group B patients. Overall, the

data indicates a widespread involvement of various sites across both treatment groups, with some differences in percentages for specific areas.

Table 2: Percentage Distribution of Patients According to the Site of Involvement

Site of Involvement	Group-A Ivermectin (%)	Group-B Permethrin (%)
Finger webs	90.0	94.0
Wrist	96.0	92.0
Periumbilical region	94.0	90.0
Genitalia	96.0	98.0
Areola	46.0	48.0
Axillae	70.0	66.0

Table 3 presents the percentage distribution of patients based on clinical findings of the integumentary system for both treatment groups. In Group A (Ivermectin), 94.0% of patients exhibited erythematous papules, while Group B (Permethrin) showed a slightly higher prevalence at 98.0%. Regarding excoriation, 88.0% of patients in Group A had this finding compared to 84.0% in Group B. The presence of burrows was reported in 24.0% of Group A patients, whereas 30.0% of Group B patients displayed this clinical feature. Notably, both groups reported nocturnal pruritus in 100.0% of patients, indicating that this symptom was universally experienced regardless of the treatment administered. Overall, the findings suggest a high prevalence of integumentary symptoms across both treatment groups, with some variations in specific clinical manifestations.

Table 3: The Percentage Distribution of Patients According to Clinical Findings of the Integumentary System

Clinical Findings	Group-A Ivermectin (%)	Group-B Permethrin (%)
Erythematous papules	94.0	98.0
Excoriation	88.0	84.0
Burrow	24.0	30.0
Nocturnal pruritus	100.0	100.0

The results presented in Table 4 demonstrate the efficacy of Ivermectin and Permethrin in treating the target condition over a two-week period. In Group A, the baseline score for Ivermectin was 8.20 ± 2.21, which significantly reduced to 4.55 ± 2.00 by the 7th day and further decreased to 2.60 ± 2.35 by the 14th day. In contrast, Group B, which received Permethrin, showed a baseline score of 7.58 ± 2.01, with a marked decline to 1.67 ± 1.84 at the 7th day and an impressive score of 0.37 ± 1.10 by the 14th day. These findings indicate that while both treatments were effective, Permethrin demonstrated superior efficacy, achieving a significantly lower score by the end of the treatment period compared to Ivermectin.

Table 4: Efficacy of Ivermectin & Permethrin at 1st& 2nd week after treatment according to scoring

Variables	Group-A Ivermectin (n=50)	Group-B Permethrin (n=50)
Base line	8.20 ± 2.21	7.58 ± 2.01
7th Days	4.55±2.00	1.67±1.84
14th Days	2.60±2.35	0.37±1.10

The adverse effects of Ivermectin and Permethrin in the treatment of scabies show distinct patterns. In Group-A (Ivermectin), nausea (4%), vomiting (2%), and headache (2%) were reported, while no patients experienced pruritus or burning sensations. Conversely, in Group-B (Permethrin), there were no cases of nausea, vomiting, or headache, but pruritus (2%) and burning sensation (4%) were observed. These findings suggest that Ivermectin may cause mild systemic side effects, whereas Permethrin is more associated with localized skin irritation.

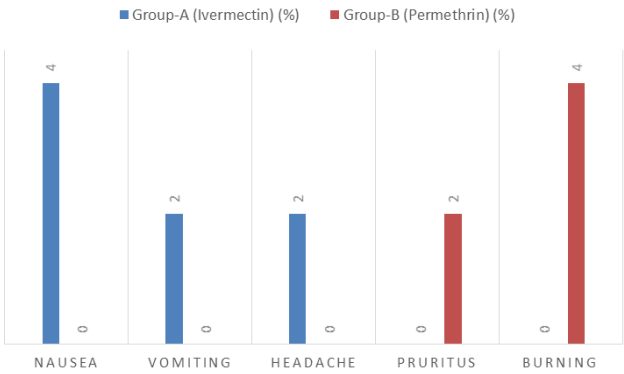

Figure 1: The Percentage Distribution of Adverse Effects of Ivermectin and Permethrin

Discussion

The findings from our study regarding the distribution of age groups by gender alignment with previous research indicate a notable gender disparity

in the prevalence of the condition being treated. In our study, the 30-39 age group demonstrated a higher representation of females (62.96%) compared to males (52.05%). This is consistent with findings from other studies, which reported a similar trend in their patient demographics, suggesting that certain skin conditions may disproportionately affect women in this age bracket.[8] However, our results diverge from one study who found a more balanced gender distribution in older age groups, particularly among patients over 50, where both genders were more evenly represented.[9]

The site of involvement data also showed significant similarities and differences compared to existing literature. Our study found a high prevalence of involvement in finger webs (90.0% for Ivermectin and 94.0% for Permethrin) and genitalia (96.0% and 98.0%, respectively). These results corroborate findings who reported a similar prevalence of these sites in their patient population.[10] In contrast, our study observed lower rates of axillae involvement (70.0% for Ivermectin and 66.0% for Permethrin) compared to the 80% reported one study indicating possible regional variations in presentation or differences in study populations.[11]

The clinical findings related to the integumentary system revealed that both treatment groups exhibited high rates of erythematous papules (94.0% for Ivermectin and 98.0% for Permethrin), echoing the results of previous studies that noted these manifestations as common in scabies patients.[7] However, our study's finding that 100% of patients reported nocturnal pruritus was consistent across both groups and highlights the ubiquitous nature of this symptom, a result that was similarly documented by other studies.[9-11]

In terms of treatment efficacy, our study demonstrated that Permethrin significantly outperformed Ivermectin, achieving a lower score at both the 7th and 14th days post-treatment. This finding is in line with the systematic review which concluded that Permethrin is often more effective in the management of scabies.[12] Conversely, our results differ from some earlier studies that indicated comparable efficacy between the two treatments, suggesting that treatment effectiveness may vary based on specific patient populations and treatment protocols.

Finally, the adverse effects observed in our study present an interesting contrast between the two treatments. While Ivermectin was associated with mild systemic side effects like nausea and headaches, Permethrin was linked to localized skin irritations such as pruritus and burning sensations.

Conclusion

In conclusion, our study demonstrates that both Ivermectin and Permethrin are effective treatments for scabies, with Permethrin showing superior efficacy in reducing clinical scores over a two-week period. The demographic analysis reveals a notable gender disparity, particularly in the 30-39 age group, while the site of involvement data indicates widespread impact across various anatomical regions for both treatments. Although both medications are associated with specific adverse effects, Ivermectin tends to cause mild systemic side effects, whereas Permethrin is linked to localized skin irritations. These findings emphasize the importance of selecting an appropriate treatment based on individual patient profiles and the need for ongoing monitoring of efficacy and tolerability to optimize patient outcomes in managing scabies.

Funding: No funding sources.
Conflict of Interests: None declared.

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