

# Comparison between efficacy of topical 1% ivermectin and topical 5% permethrin in the treatment of scabies

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## Abstract

**Objective** To compare the efficacy of topical permethrin 5% and topical ivermectin 1% in the treatment of scabies.

**Methods Design:** Experimental study/ randomized control trial study. **Setting:** Dermatology Department of Lahore General Hospital, Lahore. **Duration:** 31<sup>st</sup> January 2019 to 31<sup>st</sup> January' 2020. Total 200 patients of 18-70 years age from both genders were enrolled, and divided into 2 groups: topical Ivermectin 1% and topical permethrin 5% was given to group A and group B, respectively. The efficacy was noted by following the cases after every 2 weeks in outpatient department during 4-week treatment.

**Results** Mean age of the patients from group A was 46.50±15.26 years, while from group B was 42.46±14.42 years. Male to female ratio was 0.47:1. Out of 200 patients, the remission was achieved in 188(94%) patients out of which 97 (97%) were from Permethrin group and 91(91%) were from Ivermectin group. The difference was statistically insignificant (p-value=0.074).

**Conclusion** Topical management of scabies with ivermectin 1% and permethrin 5% is equally beneficial.

## Key words

Ivermectin, permethrin, efficacy, scabies.

## Introduction

Scabies is a problematic condition of variable prevalence faced by mankind across the globe, having range from <1 to >70%.<sup>1</sup> Areas of endemicity include Bangladesh, Pakistan and India (Zeba *et al.*, 2014). The etiological agent of this intensely itchy skin disorder is a

microscopic obligate parasitic mite named *Sarcoptes scabiei*.<sup>2</sup> Transmission occurs mostly through direct skin-to-skin contact. Characteristic disease symptoms include generalized pruritus with nocturnal predominance, small erythematous papules and burrows. Typical burrows are commonly seen on webbed spaces of fingers and flexor surfaces of the wrists.<sup>3</sup> Gender based predilection is not specific; but major risk factors recognized for scabies include: young age, overcrowding, low socioeconomic level, bad hygiene and sharing of clothes and towels.<sup>4</sup>

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The primary or classical presentation of scabies have to clearly differentiated from crusted (prominent thickened crusts with inflammatory and hyperkeratotic lesions); infected scabies (secondary bacterial infection i.e., pyoderma, impetigo due to scratching) and /or misdiagnosed pruritic cases (e.g., eczema, psoriasis or tinea corporis).<sup>5-7</sup>

Several modes either topical or oral route of medication have been implicated for the treatment of scabies. Topical prescriptions include benzyl benzoate, lindane, malathion and permethrin. ivermectin has been used orally for the management of scabies.<sup>8</sup> Permethrin 5% is currently used as an effective topical treatment option having fewer side effects. Its action as neurotoxin is to depolarizes nerve cell membranes by disrupting sodium ion influx and delay in repolarization eventually cause paralysis and death of parasite. It is applied as lotion or cream from head to toe (preferably at night), left for 8-12 hours and rinsed with reapplication after a week if required. Single application is usually curative. Side effects include mild burning, stinging and pruritus.<sup>9</sup> Topical use of ivermectin 1% binds to glutamate-gated chloride channels, leading to increase permeability of chloride ions with hyperpolarization of nerve or muscle cell causing paralysis and death of parasite. It is applied from head to toe for at least 8-12 hours and rinsed with single reapplication after one week. Burning sensation and dryness of skin are documented adverse effects<sup>10</sup>. This study is designed to compare efficacy of topical permethrin 5% and topical ivermectin 1% in the treatment of scabies in a tertiary care setting.

**Methods**

A total of 200 subjects were enrolled from 31<sup>st</sup> January’ 2019 to 31<sup>st</sup> January’ 2020 through OPD Dermatology department of Lahore General Hospital, Lahore after approval from IRB/ ERB committee. Demographic profile of

male and female of 18-70 years age noted and consent record was kept. Patients on oral/ topical steroids, immunosuppressive drugs, pregnant and lactating women, having infected or crusted scabies were not included as study participants. Patients were allocated into two groups. Group-A was treated with topical Ivermectin 1%. Group-B was treated with topical permethrin 5%. Both the preparations were applied from neck to toe for 8-12hours and rinsed with second application after one week to all subjects in respective group. Antihistamine was given to relieve pruritus. No other treatment was given during this period. Study participants were followed-up in OPD fortnightly for 4 weeks and evaluated for itching and presence of cutaneous lesion. If both were absent, then efficacy was confirmed according to operational definition i.e., presence of contagious skin condition caused by tiny mites that burrow into the skin >1 month on clinical examination.

Data was entered and analyzed by SPSS 23.0. quantitative (patient age, disease duration) and qualitative (gender, treatment efficacy and disease area involved) variables were presented as Mean±SD; and frequency and percentage respectively. Chi-square test applied and p-value calculated to compare the efficacy in both groups. P-value <.05 was taken significant.

**Results**

**Table 1** Gender wise mean age distribution in 2 groups (n=200).

Topical medicine	Male n=64 (%)	Female n=136 (%)	Age Mean±SD
Permethrin 5%	35 (54.68)	65 (47.79)	42.46±14.42
Ivermectin 1%	29 (45.31)	71 (52.21)	46.50±15.26

**Table 2** Mean duration of lesions and itching in both groups (n=200).

Duration in Days	Permethrin 5% Mean ± SD	Ivermectin 1% Mean ± SD
Lesions	8.28 ± 2.23	7.97 ± 1.78
Itching	29.56 ± 14.89	28.27 ± 14.46

**Table 3** Frequency of remission according to gender in both groups (n=200).

	Permethrin 5% n (%)	Ivermectin 1% n (%)	p-value
Male (n=64)	34 (97.14)	26 (89.65)	.218
Female (n=136)	63 (96.92)	65 (91.54)	.278
Total (n=200)	97 (97)	91 (91)	.074

## Discussion

Scabies is a severe pruritic skin infestation caused by *Sarcoptes scabiei*. World widely this tends to occur commonly in overpopulated regions with poor hygiene. Prevalence of the scabies is not temperature dependent but certainly related to humidity. The frequency of scabies is high in Pakistan, India, the South Pacific, and northern Australia, which is noteworthy. For instance, one study, conducted on young individuals in a rural area of India, prevalence of scabies was reported 70%. In some native communities in Australia, prevalence has been reported up to 50%, and surveys in Vanuatu, Fiji & Solomon Islands found scabies in children as; 24%, 18.5% and 25%, respectively, with prevalence highest as 42% in one Fijian rural area.<sup>2,11</sup>

Currently, topical use of permethrin and ivermectin are the best treatment options for scabies. Keeping in mind the therapeutic efficacy of both agents, this study was conducted on 200 subjects. Majority of the patients belonged to middle age in both groups and gender wise mostly females suffered from scabies (male to female ratio=1:2.125). The mean age  $\pm$ SD for permethrin 5% (42.46 $\pm$ 14.42) and ivermectin 1% (46.50 $\pm$ 15.26) was almost same (Table 1). Statistically, the difference was insignificant ( $p > .05$ ). The research by Sheroze *et al.* has shown the same results,<sup>12</sup> others have documented equal distribution in both genders.<sup>13-14</sup>

During treatment, the duration of lesions and itching was important to assess the improvement. For both medicinal agents used

topically, the mean duration of lesions and itching was almost equal for permethrin 5% (8.28 $\pm$ 2.23, 29.56 $\pm$ 14.89) and ivermectin 1% (29.56 $\pm$ 14.89, 28.27 $\pm$ 14.46), respectively (Table 2). Same statistics have been documented by.<sup>9,15</sup>

After 4 weeks of topical treatment with permethrin 5%, overall cure rate was 94% for both drugs (Table 3). This success rate is much higher (97%) with topical permethrin 5% as compared to other studies. Much higher percentage (>75%) cure is seen even after first week of treatment. Itching declines by more than 90% as revealed by other researchers.<sup>3,16</sup> In our study, cure rate with topical ivermectin 1% was 91%. Up to 70% cure has been proved by other researchers following application of ivermectin 1% by after one week of treatment and improvement in pruritus was seen in 95% cases.<sup>15</sup>

## Conclusion

Topical treatment with permethrin 5% and ivermectin 1% is uniformly successful for the management of scabies. Our study can be helpful to update local guidelines according to the standard protocols required as effective prescription of medication for scabies.

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