

Comparison of efficacy of oral ivermectin and topical permethrin 5% in the treatment of scabies

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Abstract

Background Scabies is a common infection caused by *sarcoptes scabiei* var.hominis. Ivermectin, an antiparasitic agent effective against a variety of ectoparasites and endoparasites. Permethrin an insecticide, applied topically kills the mite and its eggs but itching may persist for several weeks.

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

Methods It was a randomized controlled trial conducted at Dermatology Department, Sir Gangaram Hospital Lahore/ Fatima Jinnah Medical University Lahore. Sixty enrolled patients after informed consent were categorized in 2 groups. In group-A, cases were treated with Tab ivermectin orally in dose of 200 mcg/kg at day 0 and in group-B, all cases were treated with topical permethrin 5% at day 0. Clinical grading and itch grading scores were tools for comparison .The cured patients were provided antihistamines for further 1 week if itching is moderate to severe. Efficacy was determined after one week of treatment.

Results Mean age in patients who received permethrin 5% was 41.67±10.35 years and those received ivermectin mean age was 39.67±12.38 years. In permethrin 5% group, 22 (73.3%) cases showed efficacy and ivermectin group 8 (26.7%) cases showed efficacy (p value< 0.05). Permethrin (5%) remained more efficacious.

Conclusion Scabies can be treated with permethrin 5% to achieve higher cure, by doing so we can improve patient's quality of life.

Key words

Scabies, oral ivermectin, permethrin, efficacy, safety, side effects.

Introduction

Scabies is an ectoparasitic infection caused in humans by the *sarcoptes scabiei* var.hominis. The troublesome itch often disturbing the patient's sleep resulting in daytime fatigue is

characteristic. Although scabies globally has declined over the past 27 years but at the same time its incidence is increasing in High- income countries like Germany and in elderly population.¹⁻³ The disease is contagious, prolonged contact confers higher risk.⁴ Diagnosis is usually clinical. An immune response occurs after female parasite invades the epidermis and lays eggs in the stratum corneum resulting in a characteristic skin rash and pruritus, however re infection may manifest as

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earlier as 24 hours. Since pruritus is delayed in onset due to allergic phenomenon therefore it takes quite some time to settle down, once disease is treated successfully.⁵ Definitive diagnosis relies on identification of mites or its products (eggs, empty egg shells, and scybala) by microscopy. Even if mite is not visible it does not rule out scabies.⁶ Different therapies for scabies include topical anti-scabietics such as sulphur in petrolatum, benzyl benzoate, crotamiton, lindane, permethrin, tea tree oil, malathion, topical and oral ivermectin, and emerging new treatment moxidectin. Permethrin 5% is the anti-scabietic commonly used works by disruption of voltage-gated sodium channels of mite resulting in prolonged depolarization of nerve cell membranes hence, disrupted neurotransmission. Ivermectin is an off label, non FDA approved antiparasitic agent effective against *Sarcoptes scabiei*. It has an affinity for the glutaminergic chloride channels present in muscle and nerve cells. It causes paralysis and death of the scabies mite through elevated cell membrane permeability and hyperpolarization.⁵ Anti scabietic therapy kills mites and their eggs but patients may still experience some itching for several weeks.⁷

Different studies conducted in South Asia or North Africa, oral ivermectin remained slightly less successful in complete clearance after one week 43% compared to permethrin 5% cream 65%.⁸ As no local study is done and international data supporting permethrin 5% against oral ivermectin 200 µg/kg. Therefore we conducted this research to verify these results in our population, which will help dermatologist as well as local physicians in deciding preferable treatment option for this common problem and improve patient's quality of life.

Methods

It was a randomized controlled trial conducted

on total of 60 patients, after acceptance from hospital ethical committee and informed consent recruited from outpatient dermatology Department; Sir Gangaram Hospital/ Fatima Jinnah Medical University Lahore. All cases were 18-60 year of age, both male and female with clinically diagnosed mild to severe scabies as per operational definition **Scabies**: patients having generalized itch which worsen on night with typical lesions (burrows, inflammatory papules, nodules) on typical location (finger webs, the flexor surface of wrist, the elbow, the axillae, the buttock and genitalia and breast in women) on microscopy evaluation since 6 months. **Pruritus Assessment**: was assessed by asking patient to rate on a scale of 0 to 10 on visual analogue scale (VAS) score. **Severity of scabies**: was determined through lesion count using score of 0-3, showing values of: 0 (no scabies), 1= 10 or fewer lesions (mild), 2= 11-49 lesions (moderate), 3= 50 or more lesions (severe). While patients with treatment history of any topical therapy for scabies since last 6 weeks, taking topical/ systemic antibiotic therapy a week prior to study, Immunocompromised patients, crusted scabies or scabies incognito, secondary bacterial infections, allergic to permethrin/ ivermectin, pregnant or lactating mothers were excluded. Patients were categorized into group-A and group-B through lottery method. In group-A cases were treated with tab. ivermectin orally in dose of 200 mcg/kg at day 0 and in group-B all cases were treated with topical permethrin 5% at day 0 along with printed information leaflet. They were guided to apply it overnight and to wash it with warm water in the morning. The patients were called for follow up after one week for examination and ensure compliance and evaluated. **Efficacy**: It was determined in terms of complete clinical cure that was defined as reduction in both the number of lesions as well as the grade of pruritus by more than or equal to 50% (i.e. moderate and good improvement) and

negative microscopy. Primary endpoint was to achieve cure from scabietic lesions. The patients were examined to compare difference from baseline clinical grading score and itching grading score. Patients adequately treated were prescribed antihistamines for further 1 week if grade of pruritis was severe or moderate but not for mild itching. All patients were treated by single consultant. All data was collected by researcher herself. Data was entered and analysed in SPSS version 20. All quantitative variables like age and duration of disease was presented as mean±SD. All qualitative data like gender and efficacy of treatment was presented in terms of frequency (%).Data was stratified for age, gender, baseline severity and duration of disease. Test of significance was chi-square to determine efficacy in both groups, considering p-value ≤0.05 as significant.

Results

Mean age of study population was 40.67±11.36 years while the mean age of patients in permethrin 5% group was 41.67±10.35 years and in Oral ivermectin the mean age was 39.67±12.38 years. In permethrin 5% group there were 9 (30%) were male and 21 (70%) were female cases while in Oral Ivermectin group there were 7 (23.33%) male and 23 (76.67%) female cases (**Figure 1**). The mean duration of disease in permethrin 5 % group was 13.57±4.52 months and in oral ivermectin group

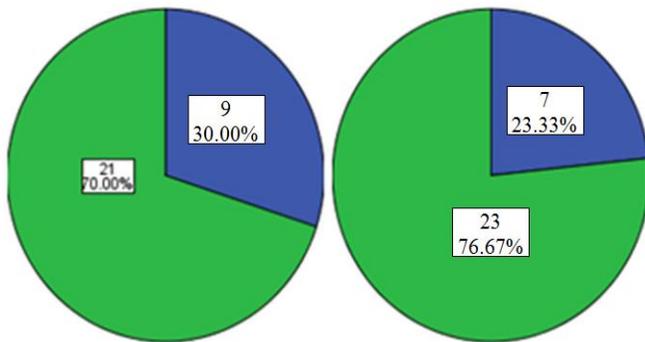


Figure 1 Distribution of gender in study groups.

Table 1 Comparison of efficacy in both study groups.

Efficacy	Study groups		Overall
	Permethrin 5 %	Oral Ivermectin	
Yes	22 (73.3%)	8 (26.7%)	30 (50%)
No	8 (26.7%)	22 (73.3%)	33 (50%)
Total	30 (100%)	30 (100%)	125 (100%)

Table 2 Comparison of efficacy in both study groups with respect to age groups.

Age groups/ Efficacy	Study groups		P value
	Permethrin 5 %	Oral Ivermectin	
18-40 yrs.			
Yes	4 (40%)	12 (92.3%)	0.007
No	16 (80%)	7 (41.2%)	
41-60 yrs.			
Yes	4 (20%)	10 (58.8%)	0.015
No	4 (20%)	10 (58.8%)	

the mean duration of disease was 13.50±4.07 months. In permethrin 5% group there were 22 (73.3%) cases had efficacy while in 8 (26.7%) efficacy was not achieved and in oral ivermectin group there were 8 (26.7%) cases who had efficacy while in 22 (73.3%) cases efficacy was not achieved. The frequency of efficacy was statistically higher in permethrin 5% group than oral ivermectin group, p-value <0.05 (**Table 1**). In 18-40 years old cases the frequency of efficacy was statistically higher in permethrin 5% group (60%) than oral ivermectin group (7.7%), p-value <0.05 while in 41-60 years old cases the frequency of efficacy was also statistically higher in permethrin 5% group (80%) than oral ivermectin group (41.2%), p-value <0.05 (**Table 2**). In male cases the frequency of efficacy was statistically higher in permethrin 5% group (66.7%) than oral ivermectin group (14.3%), p-value <0.05 while in female cases the frequency of efficacy was also statistically higher in permethrin 5% group (76.2%) than oral ivermectin group (30.4%), p-value <0.05. In cases having 7-12 months the frequency of efficacy was statistically higher in permethrin 5% group (84.6%) than oral ivermectin group (25%), p-value <0.05 while in cases having 13-24 months the frequency of

Table 3 Comparison of efficacy in both study groups with respect to duration.

Duration/ Efficacy	Study groups		P value
	Permethrin 5 %	Oral Ivermectin	
7-12 months.			
Yes	11 (84.6%)	3 (25%)	0.003
No	2 (15.4%)	9 (75%)	
13-24 months.			
Yes	11 (64.7%)	5 (27.8%)	0.028
No	6 (35.3%)	13 (72.2%)	

Table 4 Comparison of efficacy in both study groups with respect to severity of disease.

Severity/ Efficacy	Study groups		P value
	Permethrin 5 %	Oral Ivermectin	
Mild			
Yes	6(85.7%)	3 (33.3%)	0.036
No	1(14.3%)	6 (66.7%)	
Moderate			
Yes	5(50%)	1 (9.1%)	0.038
No	5(50%)	10 (90.9%)	
Severe			
Yes	11(84.6%)	4 (40%)	0.039
No	2(15.4%)	6 (60%)	

efficacy was also statistically higher in permethrin 5% group (64.7%) than oral ivermectin group (27.8%), p-value <0.05 (**Table 3**). In cases having mild, moderate and severe disease at baseline the frequency of efficacy was statistically higher in permethrin 5% group (85.7%, 50%, 84.6%) than oral Ivermectin group (33.3%, 9.1%, 40%), p-value < 0.05 (**Table 4**).

Discussion

Scabies is a common ectoparasitic infection caused by a mite, *Sarcoptes scabiei* var. *hominis*. Secondary infections are common after scabies and post-infective acute post-streptococcal glomerulonephritis is a recognized complication. In current study in permethrin 5% group efficacy noted in 73.3% while oral ivermectin group it was 26.7%. A study conducted by Sharma R, a double blind, randomized controlled trial conducted on three groups received either permethrin 5%, oral ivermectin single dose (200

µg/kg/dose) or oral ivermectin (200 µg/kg/dose) two dosages a week apart, maximum cure was noted in single nightly application of 5% permethrin group 94.7% after one week post treatment follow up, although all three regimes remained efficacious.⁹ Hence compared to present research results similarities noted.

A study done by Ranjkesh MR in Tehran compared the efficacy and safety of permethrin 5% lotion with oral ivermectin on 60 patients with scabies. The first group used 5% permethrin cream twice with 7 days interval effective in 96.9%, and the other received oral ivermectin stat and repeated after 14 days showed 92.8% efficacy. Recovery was earlier in permethrin-treated patients.¹⁰ Likewise, another study done by Golddust M *et al.*, on 240 patients. A single dose of ivermectin provided a cure rate of 85.9% at a 2-week interval in one of the groups. Twice application of permethrin with a 1-week interval was effective in 92.5% of patients of the other group. Again recovery was earlier in permethrin-treated patients. Two times application with a week interval, of permethrin was superior to a single dose of ivermectin.¹¹

Similarly an open-label, randomized controlled trial conducted in Ahmedabad, India to compared topical permethrin, oral ivermectin, and topical ivermectin on 315 patients, for four weeks. At the end of first week, 74.8% were treated in permethrin group while in oral ivermectin group 30% were disease free while 69.3% cured by topical ivermectin ($P < 0.05$). However after three weeks, 100% patients cured in permethrin and topical ivermectin group while 99% in oral ivermectin group ($P=0.367$), concluding that permethrin and topical ivermectin proved more effective compared to oral ivermectin. Topical ivermectin is another good option to treat scabies.¹²

A quasi-experimental local study compared the

two drugs for efficacy and safety on 100 patients. Group A received a single dose of 200 µg/kg body weight. Group B patients applied permethrin 5% cream at night on whole body for 12 hours, repeated if no cure in two weeks, a 2nd treatment was given with either drug. Results were statistically insignificant (P=0.15) with permethrin showing slightly better efficacy (88.1%) in clearing scabies after four week of therapy in comparison to ivermectin (79.5%). However, less side effects were noted with permethrin group than ivermectin.¹³

Permethrin is a synthetic pyrethroid having insecticidal activity with very low toxic potential to mammalian cells.¹⁴ Ivermectin is used for many parasitic infections. It is used in the veterinary and agricultural industry and its use in humans is safe.¹⁵ It is also effective against head lice infestations often co existing in those affected with scabies.¹⁶

Conclusion

Our present research recommends topical permethrin 5% over oral ivermectin to achieve better cure in scabies.

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