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Original Research Article

COMPARATIVE EFFICACY OF ORAL IVERMECTIN VERSUS SULPHUR OINTMENT (10%) IN SCABIES TREATMENT

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ABSTRACT

Background: Scabies is a common parasitic skin infestation with significant public health impact, especially in resource-limited settings. Effective treatment is essential to reduce transmission and complications. While sulphur ointment is traditionally used, oral ivermectin has gained attention as a more convenient therapeutic option. **Objective:** To compare the efficacy of oral ivermectin with 10% sulphur ointment in the treatment of scabies. **Study Design:** Randomized controlled trial. **Setting:** Combined Military Hospital, Nowshera. **Duration of Study:** 27-November-2024 to 27-May-2025. **Methods:** Seventy-eight patients aged 15 to 50 years with clinically diagnosed scabies were randomly assigned to two equal groups. Group A received oral ivermectin (200 µg/kg) in two doses, one week apart. Group B applied 10% sulphur ointment topically for three consecutive nights. Patients were evaluated two weeks post-treatment. Treatment efficacy was defined as the absence of new lesions and complete healing of existing lesions, regardless of any residual nodules. Statistical analysis was conducted to compare outcomes between groups. **Results:** The mean age was 30.56 ± 10.40 years in the ivermectin group and 32.21 ± 11.02 years in the sulphur group. Treatment success was significantly higher in Group A (82.1%) compared to Group B (53.8%), with the difference being statistically significant ($P = 0.008$). **Conclusion:** Oral ivermectin demonstrated significantly higher efficacy than 10% sulphur ointment in treating scabies. It may be considered a more effective and patient-friendly alternative, particularly in clinical settings requiring rapid and reliable resolution of symptoms.

Keywords: Scabies, Oral Ivermectin, Sulphur Ointment, Randomized Controlled Trial, Efficacy

INTRODUCTION

Scabies is a contagious skin disorder caused by the mite Sarcoptes scabiei var hominis, which tunnels into the skin and leads to intense itching. The global incidence exceeds 200 million cases each year, placing a significant burden on those impacted as well as healthcare systems, particularly in developing nations (1, 2). Scabies can lead to considerable psychosocial as well as economic consequences stemming from stigmatization, along with a reduction in workforce availability. It leads to major sleep disruptions due to itching, as well as secondary infections that arise from harm to the skin barrier. This is a common problem worldwide, especially in regions where healthcare access is insufficient and resources are restricted. In 2017, the WHO recognized scabies as a neglected tropical disease, highlighting its considerable influence on public health (3). Regrettably, there are no precise current estimates regarding the worldwide incidence of scabies due to a lack of epidemiological information (4). The 2015 Global Burden of Disease Study calculated that scabies affects over 200 million people worldwide (5).

Oral ivermectin proves to be particularly beneficial in instances of crusted scabies, as topical treatments may struggle to effectively penetrate thick skin crusts. It is also advantageous in cases where patients cannot adhere to a topical treatment regimen due to significant skin involvement, as well as during institutional outbreaks that necessitate rapid and extensive intervention (6-8). Conversely, sulphur ointment has been employed for numerous years as a scabicide. This approach proves particularly useful in circumstances where other treatment options might be unobtainable/unsuitable, such as in settings with restricted resources (9-11). A study compared the efficacy of oral ivermectin versus sulphur ointment (10%) in the treatment of scabies, which was **85.36% and 56%** respectively (10). Efficacy of oral ivermectin versus sulphur ointment in the treatment of scabies lies in the need to optimize therapeutic strategies for this highly contagious skin condition, due to the scarcity of literature on this subject locally, the goal of this study is to determine the efficacy of oral ivermectin versus sulphur ointment in the treatment of scabies at our local health setup. The findings of this study will be helpful for our medical professionals in filling the critical gaps in comparative effectiveness research, providing evidence-based guidance for clinicians and public health officials to enhance scabies management, particularly in high-prevalence and underserved areas.

METHODOLOGY

The randomized controlled trial was initiated at the Dermatology Department of Combined Military Hospital, Nowshera, from 27-November-2024 to 27-May-2025 after acquiring ethical approval from the hospital. We determined a sample of 78 patients using the previous proportion of efficacy of oral ivermectin versus sulphur ointment (10%) in the treatment of scabies, 85.36% (12) and 56% (12) respectively, taking power 80% and confidence level 95%.

Seventy-eight patients aged between 15 and 50 years and clinically diagnosed with scabies were enrolled using consecutive non-probability sampling. Patients who were pregnant or lactating and those with other dermatological conditions such as eczema, psoriasis, or urticaria, patients on long-term immunosuppressants, or with a history of epilepsy, sensitivity to study drugs, crusted scabies, prior treatment for scabies, or recent corticosteroid use were not enrolled. Scabies was diagnosed in patients who exhibited persistent itching, particularly at night, along with the presence of characteristic primary and secondary skin lesions. Primary lesions were identified as burrows, which are thin, wavy, thread-like lines visible on the skin. Secondary lesions included excoriated papules, nodules, and scratch marks, predominantly found in flexural regions and the genital area. Confirmation of the diagnosis was achieved by detecting burrows and microscopically examining skin scrapings to identify mites, their eggs, or fecal material. After obtaining consent, we gathered the baseline demographic data, which included age, gender, body mass index (BMI), education status, occupation, residence, and financial

background. Patients were then randomly assigned to two groups of equal size using blocked randomization. Group A received oral ivermectin tablets at a dose of 200 µg/kg given initially and repeated after one week for a total treatment period of two weeks. Group B was treated with 10% sulphur ointment applied for three consecutive days with a bath between each application, covering the entire body below the chin and left in place for twenty-four hours. Efficacy was defined as the absence of new lesion formation and complete healing of all old lesions upon clinical examination two weeks after initiating treatment, regardless of the presence of post-scabietic nodules. An experienced consultant dermatologist with at least five years of fellowship experience monitored the assessment process. All patient data and assessments were recorded using a pre-designed structured proforma. We used SPSS 23 for analyzing the acquired data. Age, weight, height, and BMI were calculated as mean and SD. Gender, financial background, place of living, occupation, history of scabies, education, and efficacy were evaluated using frequencies and percentages. Efficacy in both groups was evaluated using the chi-squared test. Stratification of efficacy by demographics was performed using the Chi-square test, with a significance level of $P \leq 0.05$.

RESULTS

We compared the efficacy of oral ivermectin, which was administered in Group A patients, and sulphur ointment in Group B. The mean age in Group A was 30.56±10.40 years, while Group B was 32.21±11.02 years. Body mass index (BMI) in Group A was 25.03±1.29 kg/m² and Group B was 25.14±1.40 kg/m².

Gender distribution showed that there were 22 (56.4%) males in Group A and 23 (59.0%) in Group B. Females were 17 (43.6%) and 16 (41.0%) in Groups A and B, respectively. Family history of scabies was reported by 7 (17.9%) in Group A and 6 (15.4%) in Group B (Table 1).

Regarding efficacy, oral ivermectin showed superior outcomes with 32 (82.1%) patients achieving cure compared to 21 (53.8%) in the sulphur ointment group. Conversely, treatment failure was observed in 7 (17.9%) in group A and 18 (46.2%) in Group B, respectively, with a statistically notable difference (p=0.008).

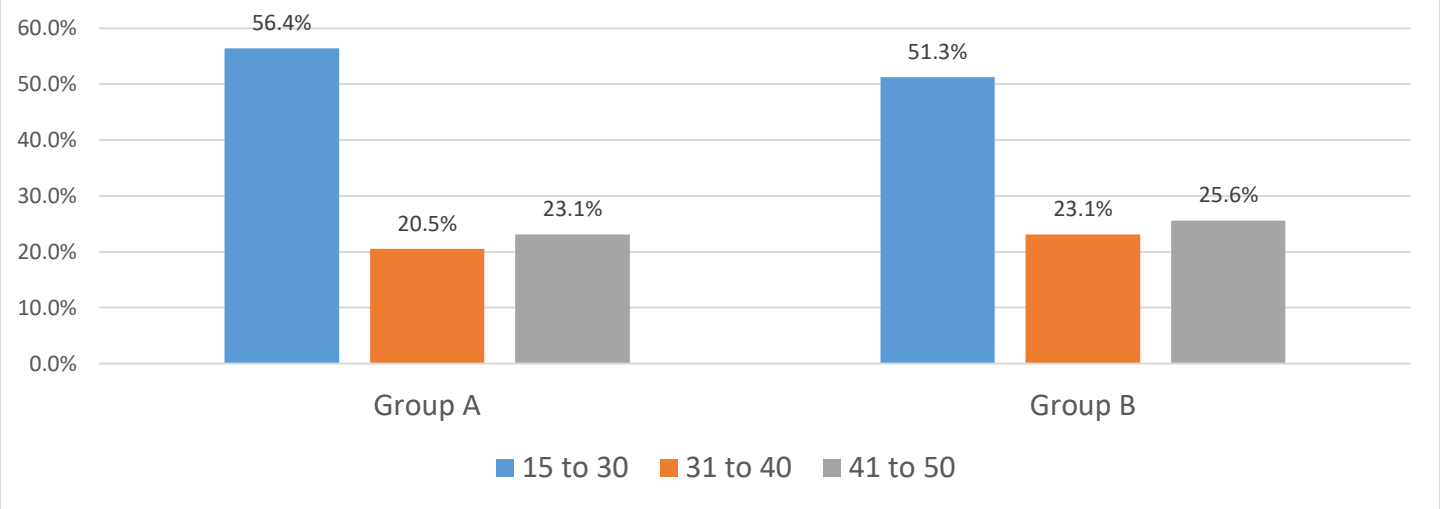

Figure 1: Age distribution in both groups (Years)

Table 1: Demographics of the patients in both groups

Demographics		Groups			
		Group A (Oral ivermectin)		Group B (Sulphur Ointment)	
		N	%	N	%
Gender	Male	22	56.4%	23	59.0%
	Female	17	43.6%	16	41.0%
Financial background	Low	10	25.6%	11	28.2%
	Middle	26	66.7%	22	56.4%
	High	3	7.7%	6	15.4%
Education status	Educated	20	51.3%	22	56.4%
	Uneducated	19	48.7%	17	43.6%
Occupation status	Employed	23	59.0%	20	51.3%
	Unemployed	16	41.0%	19	48.7%
Place of living	Rural	23	59.0%	22	56.4%
	Urban	16	41.0%	17	43.6%
Family history of scabies	Yes	7	17.9%	6	15.4%
	No	32	82.1%	33	84.6%

Table 2: Comparison of efficacy in both groups

Efficacy	Groups				P value
	Group A (Oral ivermectin)		Group B (Sulphur Ointment)		
	N	%	N	%	
Yes	32	82.1%	21	53.8%	0.008
No	7	17.9%	18	46.2%	

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Table 3: Stratification of comparison of efficacy in both groups concerning demographics

Demographics				Groups				P value
				Group A (Oral ivermectin)		Group B (Sulphur Ointment)		
				N	%	N	%	
Gender	Male	Efficacy	Yes	16	20.5%	14	17.9%	0.39
			No	6	7.7%	9	11.5%	
	Female	Efficacy	Yes	16	20.5%	7	9.0%	0.002
			No	1	1.3%	9	11.5%	
Financial background	Low	Efficacy	Yes	6	7.7%	1	1.3%	0.01
			No	4	5.1%	10	12.8%	
	Middle	Efficacy	Yes	23	29.5%	17	21.8%	0.30
			No	3	3.8%	5	6.4%	
	High	Efficacy	Yes	3	3.8%	3	3.8%	0.13
			No	0	0.0%	3	3.8%	
Education status	Educated	Efficacy	Yes	16	20.5%	15	19.2%	0.38
			No	4	5.1%	7	9.0%	
	Uneducated	Efficacy	Yes	16	20.5%	6	7.7%	0.003
			No	3	3.8%	11	14.1%	
Occupation status	Employed	Efficacy	Yes	19	24.4%	12	15.4%	0.09
			No	4	5.1%	8	10.3%	
	Unemployed	Efficacy	Yes	13	16.7%	9	11.5%	0.03
			No	3	3.8%	10	12.8%	
Place of living	Rural	Efficacy	Yes	18	23.1%	12	15.4%	0.09
			No	5	6.4%	10	12.8%	
	Urban	Efficacy	Yes	14	17.9%	9	11.5%	0.03
			No	2	2.6%	8	10.3%	
Family history of scabies	Yes	Efficacy	Yes	3	3.8%	1	1.3%	0.30
			No	4	5.1%	5	6.4%	
	No	Efficacy	Yes	29	37.2%	20	25.6%	0.005
			No	3	3.8%	13	16.7%	
Age distribution (Years)	15 to 30	Efficacy	Yes	16	20.5%	10	12.8%	0.13
			No	6	7.7%	10	12.8%	
	31 to 40	Efficacy	Yes	8	10.3%	6	7.7%	0.07
			No	0	0.0%	3	3.8%	
	41 to 50	Efficacy	Yes	8	10.3%	5	6.4%	0.06
			No	1	1.3%	5	6.4%	
BMI (Kg/m2)	18 to 24.9	Efficacy	Yes	14	17.9%	10	12.8%	0.17
			No	5	6.4%	9	11.5%	
	> 24.9	Efficacy	Yes	18	23.1%	11	14.1%	0.01
			No	2	2.6%	9	11.5%	

DISCUSSION

Our findings showed that oral ivermectin leads to a notably higher cure rate (82.1%) compared to sulphur ointment (53.8%), with a notably lower failure rate (17.9% vs. 46.2%; p=0.008). This suggests an apparent superior efficacy of ivermectin in clinical practice, especially in populations with similar demographics and socioeconomic status.

Compared to our findings, Al Jaff et al. involved 225 patients in their research and observed that oral ivermectin achieved a cure rate of 85.36%, which closely matches our findings. At the same time, sulphur ointment showed notably lower efficacy at 56% (12). This consistency strengthens the evidence favoring ivermectin as a more effective systemic agent compared to topical sulphur ointment. Oral ivermectin has favorable patient compliance compared to sulfur ointment, which tends to have issues with application and irritation.

Similarly, Alipour et al. reported that a single oral dose of ivermectin initially achieved 61.9% cure at 2 weeks, which increased to 78.5% after retreatment at 4 weeks, outperforming sulphur ointment, which had a maximum cure of 59.5% after retreatment (13). While their initial cure rates appeared lower than ours, the trend of ivermectin's superiority remained evident in both our study and theirs. Differences in study designs, along with dosing regimens and follow-up durations, could explain these variations. Their study also highlighted that ivermectin may not be fully effective against all parasite stages in a single dose, supporting the need for repeated dosing, which might explain the temporal delay in the response.

Further, a pediatric-focused study by Aman et al compared topical 1% ivermectin cream with 5% permethrin in children, showing that ivermectin cream provided better symptom relief with faster reduction in lesions and fewer adverse effects (14). This study underlines ivermectin's growing role in topical formulations and its potential advantages, especially in pediatric patients, which might pave the way for future research and clinical decisions beyond systemic oral use.

Mila-Kierzenkowska et al. compared three topical applications: permethrin, crotamiton, and sulphur ointment. They found permethrin to have the fastest and most effective cure rate, with sulphur ointment demonstrating slower efficacy at first and two weeks (15). Their study echoes our findings regarding the sulphur ointment's relatively lower efficacy. They mentioned in their study that premethrin is an expensive application, while crotamiton lotion is a less costly alternative. In contrast, Ilyas et al compared ivermectin with

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permethrin 5% cream; they reported higher efficacy for permethrin (73.3%) over ivermectin (26.7%) after one week. As mentioned by the study above, premethrin is a costly application that may not be affordable for the majority of the population (15).

Oral ivermectin offers superior efficacy to sulphur ointment with faster resolution of scabies symptoms. However, permethrin often offers even higher efficacy, though it's expensive and has some potential for irritation. Sulphur ointment, while affordable and accessible, appears less effective and slower acting, which could influence patient adherence along with overall treatment success.

CONCLUSION

We conclude that oral ivermectin exhibited better efficacy than sulphur ointment (10%) in the treatment of scabies, with a statistically notable difference. We recommend further trials comparing ivermectin with other topical and oral alternatives for scabies.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRB—Ref#06)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

MUHAMMAD ALI SARWAR (Trainee Medical Officer)

Data Collection, Data Entry, Data Analysis, Review of literature, Study Design, Manuscript Drafting, and Review of Manuscript.

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SUMMAYA SALEEM (Assistant Professor)

Conception of Study, Critical Input, and Final Approval of Manuscript.

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