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Comparative Study Between Permethrin-5% and Oral Ivermectin for the Treatment of Scabies

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ABSTRACT

Objective: To compare the efficacy of 5% Permethrin with the oral Ivermectin for management of scabies.
Study Design: Quasi-experimental Study.
Place and Duration of Study: Department of Dermatology, CMH, Abbottabad Pakistan, from Jun to Nov 2021.
Methodology: Our study enrolled 100 patients, aged 5-80 years, after informed consent. Demographic information and study variables were noted in a data collection tool. All participants were randomly assigned to one of two groups i.e. Group A received Permethrin 5% twice with a one-week interval, whereas Group B received a single dose of oral Ivermectin. The evaluation was conducted at 2-4 week intervals.
Results: From our sample of 100 participants, 57 were females and 43 were males; age ranged from 5 to 80 years. Group A of Permethrin-5% 43(86%) patients' symptoms improved than in Group B 24(48%) patients of oral Ivermectin. There was also a statistically significant relationship between Permethrin and Ivermectin (p-value<0.001).
Conclusions: Permethrin is more effective than Ivermectin as first dose response. Permethrin is more compliant and safer for scabies patients.

Keywords: Ivermectin, Permethrin, Scabies.

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INTRODUCTION

Globally, Scabies infects 300 million people each year and among children of developing countries, its prevalence is estimated to be about 5-10%.[1] In Pakistan, Scabies accounts for 38% of dermatological diseases. Males are more prone to infestation than females, and early school-aged children are the most vulnerable as it is usually transmitted by prolonged skin-skin contact.[2] It was more widespread in urban than in rural areas with a distinct seasonal pattern,[3] with the biggest infestation occurring in the winter and the lowest in the summer with all risk factors accounting for 89% of the variation in its prevalence.[4] The classic scabies symptoms include an erythematous papular eruption, burrows, and intense itching with a predilection for fingers, axilla, elbows, waist, belly, groin, genital area, etc.[5] Classic scabies can be diagnosed by proper history taking and clinical examination. On examination under a microscope of scrapings collected from skin lesions, finding of mites or eggs, confirms the diagnosis of scabies.[6] Topical Permethrin and oral Ivermectin are the medications of choice.[7] Topical Permethrin 5% applied for 9-14 hours for adults and 8-9 hours for children. Permethrin 5% only single dose is enough, but the second dose can be applied after an interval of 2 weeks if the infestation is still there.[8] Ivermectin is now used to treat scabies, with an effective dosage of 150 to 200 µg/kg given once or may give twice after intervals of two weeks. The advantages of this drug are its single dosage and improved compliance in resistant infestations and situations where head-to-toe topical administration is logistically problematic, such as huge outbreaks or mentally impaired individuals.[9] Fever, arthralgia, myalgia, dizziness, headache, hypotension, tachycardia, and lymphadenopathy have all been reported as adverse effects. There have also been reports of a prolonged prothrombin time and variations in liver enzymes.[10]

The objective of this study is to compare the efficacy of these two drugs while treating scabies in order to assess the better outcome of each drug scabies' patients with evidence-based management. This study will also help to determine the patient compliance of each drug.

METHODOLOGY

The quasi-experimental study was conducted at the Dermatology Unit of CMH, Abbottabad Pakistan, from June to November 2021 after being granted

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Ethical Review Board approval (Reg# CMHAtd-ETH-23Derm-22). The sample size was calculated taking expected cure rate of Permethrin as 93% and Ivermectin as 63%.[11]

Inclusion Criteria: The study recruited those patients having scabies, aged >2 years old, >15kg of body weight, and attended the Dermatology Department.

Exclusion Criteria: Pregnant or breastfeeding women, patients with a background of seizures, severe symptoms of systemic illnesses, immunosuppression diseases, or Norwegian scabies, and those who had taken any topical or systemic acaricide medication for one month before the study, were excluded.

We enrolled 100 patients aged 5-80 years, after taking informed consent. The calculated sample size was 60 with 30 in each group however sample size of 100 was taken (50 both group) to increase the validity of the study. All the patients underwent a medical checkup, and their history of infestations, antibiotic medication, age, gender, and weight were all noted for analysis. Digital photos were taken for further clinical evaluation after getting consent by confirming anonymity and confidentiality.

Patients were randomly assigned via lottery method into one of two groups i.e., Group A received Permethrin 5% twice within a one-week interval, whereas Group B received a single dose of oral Ivermectin 200 mcg per kg(Figure). They were instructed not to take any antipruritic or topical medicine. The patients were evaluated and assessed clinically at 2-4-week intervals after treatment by experienced practitioners who were blinded to the treatment received by that patient in each respective group. A "cure" was defined as the absence of new lesions and the healing of all prior lesions, independent of the presence of post-scabetic nodules. At the 2-week follow-up, the presence of microscopically validated new lesions was labelled a "treatment failure." In such cases, the therapy was repeated at the end of the second week, and patients were re-evaluated at the end of the fourth week. "Re-infestation" was defined as a cure after two weeks but the formation of new lesions with positive microscopic results one month later. Any patient who showed signs of scabies, whether as a result of treatment failure or re-infestation, was treated with 1% Lindane lotion.

Statistical Package for Social Sciences (SPSS) version 26.0 was used for the data analysis. Quantitative variables with normal distribution were expressed as Mean±SD and qualitative variables were expressed as frequency and percentages. Chi-square test was applied to explore the inferential statistics. The *p*-value lower than or up to 0.05 was considered as significant.

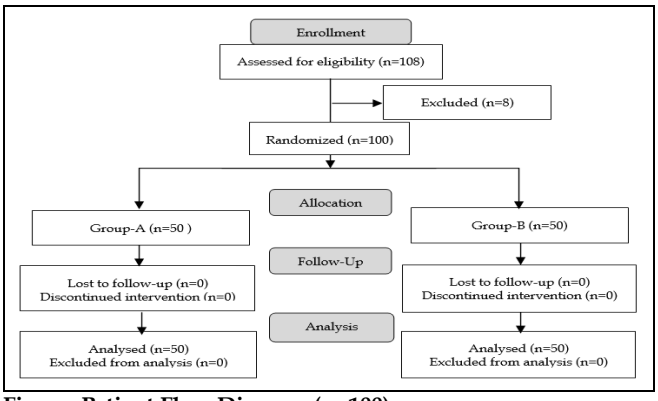

Figure: Patient Flow Diagram (n=100)

RESULTS

After the initial follow-up assessment of 108 patients, 8-patients (Group A, 4 and Group B, 4) were unable to come back into the study and were thus omitted, the remaining 100 subjects comprising 57 females, 43 males with mean age 35.28+18.51 years were randomly assigned into two groups. Table-I displays descriptive statistics of demographic characteristics of the two treatment groups. Table-II shows difference between the response of dose Permethrin vs Ivermectin Groups and showed that 43(86%) patients' symptoms improved at the first dose of Permethrin 5% and 24(48%) patients with oral Ivermectin, thus having a significant relationship between them (*p*-value <0.05).

Table-I: Demographic Characteristics of the Study Patients (n=100)

Variables	Permethrin-Group Mean±SD	Oral Ivermectin-Group Mean±SD
Age (years)	33.46±17.20	37.10±19.73
Weight (kg)	58.7±10.50	60.32±11.28
Gender	n(%)	n(%)
Male	22(44%)	21(42%)
Female	28(56%)	29(58%)

Table-II: Difference of Dose Response Between Permethrin and Ivermectin Groups (n=100)

Response of Dose	Permethrin-Group n(%)	Oral Ivermectin-Group n(%)	*p*-value
At first dose	43(86%)	24(48%)	<0.001
At second dose	7(14%)	26(52%)	
Total	50(100%)	50(100%)	

DISCUSSION

This study was conducted to determine the dose response relationship and explore the compliance of each drug for scabies patients. The study results showed that with Permethrin -5% patients' symptoms improved more than patients of oral Ivermectin after the first dose which is similar to the result of the study of Ranjkesh *et al*.[11] Permethrin 5% is a much better treatment option for scabies because of its aesthetic goodness and simple use, pleasant odor, and no clothing stain. Skin itching, swelling, and erythemaClick or tap here to enter text. can happen with scabies patients and may exacerbate following Permethrin therapy, but mild stinging or burning might occur as a result of the absorption of dead parasite proteins.[12]

Oral Ivermectin has slightly lower rates of complete clearance in the 1st week compared with Permethrin 5%. and some patients experienced adverse events in the 4th week similar to the findings of other studies.[13,14] Ivermectin is useful for severely crusted lesions and in immunocompromised patients, or when any topical agent failed as in this study when 26(52%) patients did not cure completely, the second dose was needed to improve symptoms.[15] Ivermectin site of action make it ineffective against parasite at early age stage inside the egg as it has not developed a nervous system[16,17] which could also explain the temporal delay and incomplete recovery from pruritus.[18,19] In comparison to our findings, Usha *et al*.[20] report many patients with lesion resolution. This might be explained by the prolonged follow-up period. A 100% cure rate was reported in both therapy groups in research conducted by Behera *et al*.[21] presumably because the trial was conducted on fewer patients with a follow-up of 2-week, aged 12 years or older when the sebaceous gland is overactivated however the application of this medicine may prove difficult for children to comply with in the absence of parental assistance.

LIMITATION OF STUDY

The present study was conducted over a relatively short period of time and depending on the nature of the disease, large randomized multicenter trials with relatively long follow-ups are required to further confirm the results for assessing the efficacy of distinctive modes of treatment and, as a byproduct, reduce the psychological and sociological burden of one of the most discomforting conditions a person may face, with the utmost goal of improved life quality.

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CONCLUSION

Permethrin is more effective than Ivermectin at first dose response whether under or without supervision it also has better compliance. It is also safer for scabies patients.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

NK & MH: Conception, study design, drafting the manuscript, approval of the final version to be published.

BM & AS: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

RAK & TN: Data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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