

ORIGINAL ARTICLE

COMPARISON OF EFFICACY OF PERMETHRIN 5% CREAM WITH CROTAMITON 10% CREAM IN PATIENTS WITH SCABIES

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Background: Scabies is a common dermatological presentation in Pakistan. Permethrin and Crotamiton both are used widely for treating scabies. As there is no local study available regarding comparison of efficacy of Permethrin and Crotamiton in patients of scabies, current study was undertaken. The objective of the study was to compare the efficacy of 5% Permethrin with 10% Crotamiton in patients of scabies. **Methods:** A Randomized control trial was conducted at Dermatology Department, Military Hospital, Rawalpindi. One hundred and sixty patients with scabies (diagnosis made by scraping the burrows to extract mite, larva or eggs and to see under light microscope) were randomly assigned either to Permethrin or Crotamiton group. Patients were followed over for 4 weeks to determine the effectiveness of either treatment. **Results:** A total of 160 patients were included in the study with a mean age of 45.49 ± 17.047 years and ranging from 13–65 years. One hundred and one patients (63.1%) were male and remaining 59 patients (26.9%) were female. Treatment was effective in 81.3% patients being treated with 5% Permethrin and 53.8% in 10% Crotamiton group. Comparison of treatment showed superiority of 5% Permethrin over 10% Crotamiton ($p=0.001$). There was no effect of age and gender on this outcome difference. **Conclusion:** Our study concludes that 5% Permethrin cream is significantly superior to 10% Crotamiton cream in treating patients of scabies (81.3% vs. 53.8%, $p=0.001$).

Keywords: *Sarcoptes scabiei*; Permethrin; Crotamiton; Scabies

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INTRODUCTION

Scabies is a contagious, intensely itchy parasitic skin infection, which is caused by tiny mite called *Sarcoptes scabiei*.¹ The scabies has worldwide estimated prevalence of 300 million cases per year.² Scabies is particularly widespread in countries that have a high population density, are economically constraint and lie in tropical areas of globe.³ The infestation can occur at any age.⁴ *Sarcoptes scabiei* resides at warm places on skin by digging burrow at the outer layer of skin (epidermis).⁵ The severity of infestation is related to number of mites residing on skin and duration of time of initial infestation and subsequent treatment. Scabies is usually diagnosed clinically based on history and examination. However, definitive diagnosis relies on microscopic identification of mites, eggs or fecal pellet extruded from lesions of scabies.^{5,6}

Mites multiply daily if diagnosis and treatment are delayed, resulting in progression to crusted scabies.³ Secondary skin infection (bacterial pyoderma) can occur as a result of skin irritation and inflammation due to excessive itching. Such secondary infection can lead to complications such as post-streptococcal glomerulonephritis and systemic sepsis.⁷ Treatment should be started if scabies is suspected clinically, even if it is not confirmed by microscopy. Treatment must be given to all house hold members to prevent reinfection. Multiple therapeutic modalities are available for it.

These include topical 5% Permethrin cream, 1% Lindane lotion, 6% Precipitated sulfur in petrolatum, Crotamiton, Malathion, Benzyl benzoate and systemic Ivermectin.⁸

Permethrin is an insecticidal agent. It belongs to the family of synthetic chemicals called pyrethroids and functions as a neurotoxin, affecting neuron membranes by prolonging sodium channel activation.⁹ It has been the most effective treatment for scabies with efficacy as high as 85%, and is the treatment of choice.¹⁰ Reports of treatment failure in some communities suggest the emergence of Permethrin resistance as a possible cause for treatment failure, so there has been an intensive search for alternative therapies.¹⁰ Crotamiton is an anti-itching agent which is also used to treat scabies. It is alcohol-based compound and evaporates from the skin thus produces cooling effect and hence distracts patient's awareness of pruritis.¹¹ It has been used to treat scabies in various trials with efficacy of 64.7 percent.¹² It is safe alternative treatment for scabies.

Both Permethrin and Crotamiton are used for local application over skin to treat scabies. The rationale of this study is to compare and evaluate the efficacy of topical Permethrin with topical Crotamiton for treatment of scabies. The inference would not only help the physicians in decision making, but would also improve the treatment outcomes.

MATERIAL AND METHODS

This randomized control study was conducted in Dermatology department, Military Hospital, Rawalpindi from 1st January to 30th June 2016. The study was approved by the ethical review committee of Military Hospital, Rawalpindi. Consecutive non probability sampling technique was used in collection of samples. Patients were randomly divided into two groups, i.e., Group I (Permethrin cream group) and Group II (Crotamiton cream group). Sample size of eighty (n=80) patients in each group was calculated using WHO sample size calculator for two proportions based on outcome variables keeping level of significance 5% and power of test at 90%.^{10,12} Patients in group I received treatment as two topical applications one week apart. On the other hand, those in group II received twice daily topical application of Crotamiton ointment for consecutive 5 days. Patients fulfilling following inclusion criteria were included in this study: age between 13–65 years, patients of both genders, patients with scabies (diagnosis made by scraping the burrows to extract mite, larvae or eggs and to see them under light microscope). Whereas following patients were excluded from the study; pregnant females, Norwegian scabies, patients using or having used any topical or systemic scabies treatment during last 1 month, patients with Diabetes mellitus or history of organ transplantation, history of seizures, severe systemic disorders or immunosuppressive disorders, patients unwilling to be included in the study.

Patients of scabies fulfilling the inclusion criteria were selected from dermatology outpatient department at Military Hospital Rawalpindi after informed consent and permission from Hospital Ethics Committee. Hospital registration number, age, gender, and address with contact phone number were noted for each patient. Disease was diagnosed on the basis of clinical features of scabies and diagnosis confirmed by scraping the lesions of scabies, examined under light microscope and detection of eggs, larvae or mites. Random allocation of treatment was done, those reporting on even dates were included in first group and those reporting on odd dates were included in second group. Before start of treatment, careful history & examination, type of lesions were recorded on data collection proforma. All information was collected on a specifically designed proforma. Patients were followed up fortnightly for one month. Response to treatment was termed efficacious as complete resolution of symptoms as well as lesions (papules, nodules & burrows) after 4 weeks of therapy in both groups. All data was recorded and was entered into SPSS-21.0 and analyzed. Quantitative data like age (in years) and number of burrows were presented as means and standard deviations. Qualitative data like gender and efficacy of

the treatment (yes/no) was presented as frequency and percentages. Post stratification chi-square test was applied. *p*-value ≤0.05 was considered significant.

RESULTS

There were 160 patients in this study with a mean age of 45.49±17.047 and range from 13 to 65 years. One hundred and one (63.1%) were male and remaining 59 patients (63.1%) were female.

Mean number of burrows on the affected individuals was 6.15±1.626, ranging from 4 to 10. Treatment was found effective according to operational definition in 108 patients (67.5%) while it was ineffective in 52 (32.5%) patients. When we cross tabulated study group with efficacy and used Pearson chi square test results came up significant (*p*=0.001) that showed statistically unequal distribution of efficacy in both Permethrin and Crotamiton groups. This is illustrated in table-1. When age group was stratified regarding efficacy against study group, only patients with age below 40 years showed statistically significant results (*p*=0.001) for both Permethrin and Crotamiton while in age group above 40 years all patients showed non-significant difference in efficacy results as shown in table-2. When gender groups were stratified regarding efficacy in both study groups, only male patients showed statistically significant results (*p*=0.001) for Permethrin and Crotamiton while female patients showed non-significant results for both study groups (Table-3).

Table-1: Cross tabulation between groups and efficacy

		Efficacy		Total	
		Yes	No		
Group	Permethrin	Count	65	15	80
		% within Group	81.3%	18.8%	100%
	Crotamiton	Count	43	37	80
		% within Group	53.8%	46.3%	100%
Total		Count	108	52	160
		% within Group	67.5%	32.5%	100%

Using Pearson chi square test = 0.001 (significant)

Table-2: Age groups stratification regarding efficacy

Age Groups		Efficacy		Total	<i>p</i> -value
		Yes	No		
Below 40 years	Group	Permethrin	23	0	23
		Crotamiton	11	14	25
	Total	34	14	48	0.001
40 Years & above	Group	Permethrin	42	15	
		Crotamiton	32	23	55
	Total	74	38	112	0.11

Table-3: Gender stratification regarding efficacy

Gender		Efficacy		Total	
		Yes	No		
Female	Group	Permethrin	29	7	36
		Crotamiton	13	10	23
	Total	42	17	59	0.47
Male	Group	Permethrin	36	8	
		Crotamiton	30	27	57
	Total	66	35	101	0.02

DISCUSSION

There are relatively few well-designed trials comparing treatments for scabies.¹³ Considering the toxicity and efficacy of various therapies, topical Permethrin 5% cream and oral Ivermectin are reasonable first-line therapies. Other topical treatments for scabies include Benzyl benzoate, Crothamiton, Lindane, Malathion and Sulfur in petrolatum.¹⁴

In our study, comparison of treatment showed superiority of 5% Permethrin over 10% Crothamiton ($p=0.001$). Treatment was effective in 81.3% patients being treated with 5% Permethrin while for only 53.8% in 10% Crothamiton group. Our study results match with previous studies carried out by Pourhasan A et al and Goldust M *et al.*^{10,12} In study by Pourhasan A *et al*, the efficacy of 5% Permethrin was 85% while in study by Goldust M *et al*, efficacy of 10% Crothamiton was 64.7%. In another trial, 5% Permethrin cream was found effective after a single whole-body application in 91% patients with scabies as compared to 86% being treated with 1% lindane lotion.¹⁵ In a study done previously in Pakistan the efficacy rate of 5% permethrin cream used for treating scabies was 87.58% which is, yet again, very close to our results.¹⁶ Another study from Pakistan showed effectiveness of topical 5% permethrin equivalent to oral ivermectin in treating scabies.¹⁷ The difference in efficacy may be attributed to ease of application of 5% Permethrin as compared to 10% Crothamiton.

One hundred and sixty patients were included with mean age of 45.49 ± 17.047 years ranging from 13 to 65 years. It implies that all age groups are equally affected by scabies. One hundred and one patients (63.1%) were male and remaining 59 patients (26.9%) were female. More male in our study may be secondary to consecutive non probability sampling from a single hospital or treatment seeking behavior of our population. Limitations of current study includes single center trial and small sample size.

CONCLUSION

Our study concludes that 5% Permethrin cream is significantly superior to 10% Crothamiton cream in treating patients of scabies.

AUTHORS' CONTRIBUTION

MAR: Conceptualization of study, data collection, analysis and write-up. NR: Literature search, write-up. MF: Data collection, proof reading. MAS: Write-up, proof reading

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