COMPARISON OF EFFICACY OF ORAL IVERMECTIN AND TOPICAL PERMETHRIN IN THE TREATMENT OF SCABIES

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ABSTRACT

Background: Scabies is a common communicable disease. Various topical therapies are available for treatment of scabies. There is only one systemic scabicide. This oral drug is easy to administer and has limited side effects.

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

Patients and methods: In this quasi experimental study, a total of 194 patients of scabies were enrolled and randomly divided in 2 groups of 97 each. Oral ivermectin as 200ug /kg and topical 5% permethrin whole body application for minimum 12 hrs were used in group A and B respectively. In both groups history, examination and microscopy were carried out at day 0,7, and day 14. Response to treatment was judged as: decrease in severity of pruritus, non appearance of new lesions and absence of burrows. Each parameter was scored and sum total of individual scores was used to determine the efficacy.

Results: Average age in group A was 30.23±8.23SD while Group B contains 29.32± 7.89SD with p-value p=0.543. Male to female ratio 1.58:1. Efficacy in both the groups was observed insignificant with p= 0.344, 0.513 at day 7 and day 14 respectively.

Conclusion: There is no significant difference regarding efficacy of oral ivermectin and topical permethrin in treatment of scabies.

Key Words: ivermectin, permethrin, scabies .

INTRODUCTION

Scabies is a common, contagious ectoparasitic skin infection caused by the mite Sarcoptes scabiei, characterized by an intensely pruritic skin eruption mainly at night with characteristic distribution.[1] It is common worldwide, with an estimated 300 million people infected each year.[2] It is high prevalent in underdeveloped countries due to overcrowding and poor hygiene.[3,4]

Clinical diagnosis is made on history of intractable pruritus, worse at night, and with pathognomonic sign burrow in the web spaces, fingers, flexor surfaces of the wrists, axillae, abdomen (around the umbilicus), lower portions of the buttocks, and genital areas.[5,6]

In women characteristic feature is itching of the nipples associated with generalised pruritic papular eruption. In men itchy papules on the scrotum and penis are virtually pathognomonic.

In infants and young children scabies often affects the face, head, neck, scalp, palms, and soles, and there is often generalised skin involvement. In infants the commonest presenting lesions are papules and vesicopustules, which are particularly common on the palms and soles. Definitive diagnosis relies on microscopic identification of mites or eggs from skin scrapings of a burrow.[5,6]

Scabies treatment includes administration of a scabicidal agent (eg, permethrin, lindane, or ivermectin), as well as an appropriate antimicrobial agent if a secondary infection has developed.

In a World Health Organization (WHO)–sponsored study in the Solomon Islands, an intervention of mass treatment with ivermectin or permethrin led to a decrease in prevalence of scabies from 25% to less than 1%, as well as a decrease in the prevalence of pyoderma (secondary infection) from 40% to 21%. There was also a decline in hematuria, which was a sign of renal damage by group A Streptococcus, secondary infection in children.[7] Treatment also decreased occurrence of streptococcal skin disease. Similar successes have been reported in other populations.[8,9]

Permethrin is the most effective treatment for scabies, and remains the treatment of choice. It is applied from the neck down, usually before bedtime, and left on for about 8 to 12 hours, then washed off in the morning.[10,11,12]

Oral Ivermectin is effective in eradicating scabies, often in a single dose.[11] It is the treatment of choice for crusted scabies, and is sometimes prescribed in combination with a topical agent.[11,13] It has not been tested

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on infants, and is not recommended for children under six years of age.[13]

Ivermectin is related to macrolide antibiotics, it was developed in the 1970s as a veterinary treatment for animal parasites.[14] Ivermectin also has been used to treat animals scabies.[15] Ivermectin has been used in humans to treat millions of cases of onchocerciasis, filariasis, and intestinal nematodal infections such as strongyloidiasis.[16]

Ivermectin works by interrupting the functioning of a class of ligand-gated chloride ion channels in the scabies mite, causing persistent channel opening. it has been postulated that ivermectin causes excessive release of the neurotransmitter gamma-aminobutyric acid (GABA) in the nervous system of the parasite, resulting in its death.[17] Because of life-cycle-dependent variability in ligand-gated chloride ion channel expression, ivermectin may not be effective against all stages of the parasite.[18]

In comparison, permethrin acts by disrupting the sodium channel current, resulting in delayed repolarisation, causing paralysis and death of the mite. As sodium channels are ubiquitous, permethrin is active against all stages of the life cycle of the parasite.[18]

In one of these trials ivermectin was given as either a single dose or two doses separated by 1 week, depending on response to the first dose. After the 2-week follow up, ivermectin had a 100% cure rate (defined as no new lesions), but when comparing ivermectin and permethrin at 1 week, permethrin had a significantly faster cure rate than ivermectin (82.14% vs 55.56%).[19]

In another trial Permethrin performed better than ivermectin, with a single application being effective in 97.8% of patients, compared with a single dose of ivermectin with a 70% cure rate that increased to 95% after the second dose at 2 weeks[18,19].

PATIENTS AND METHODS

It was a quasi experimental study carried out at Dermatology unit Hayatabad Medical complex Peshawar from June 2015 to Dec 2015. Patients of either sex with diagnosis of scabies, aged 12-50 years were enrolled. Confirmation was done by burrow detection and microscopic evidence of sarcoptes scabiei mite. Exclusion criteria was hypersensitivity to permethrin or ivermectin, prior use of topical and systemic scabicides, pregnant and lactating patients, use of steroids or other immunosuppressive drugs for any cutaneous or systemic disorder, patients having neurological, hepatic or renal disfunction.

A total of 194, patients with scabies were enrolled in our study. Patients were randomly divided in 2 groups. Each group include 97 patients.

After written informed consent from patients, detail history, examination, burrow detection and microscopy for mite detection recorded on a pre designed proforma on the first day, before starting treatment. In group A, ivermectin tablets were taken as 200ug/kg body weight. In group B, topical permethrin 5% in lotion form was used. Patients were given written and verbal instructions about usage of lotion. It was applied on whole body from neck to toes after a bath and kept for 10-12 hrs, then again followed by a bath.

All patients were given antihistamine at bed time during first 10 days. In both groups patients were advised not to use any other scabicidal during study period. After completion of therapy bed covers and clothes has to be washed and ironed.

RESULTS

A total of 194 patients were selected which were equally divided in two groups. Group A were givne ivermectin tablets while Group B were managed through topical permethrin.

Average age in group A was 30.23 ± 8.23SD while Group B contains 29.32 ± 7.89SD with p-value $p=0.543$. Male were preponderance in both the group but insignificant with p-value$=0.278$. Majority of patients were found with people having similar symptoms (p-value$=0.433$). Most of patients were presented with moderate itching in both the groups with insignificant p-value$=0.815$. Table 1

We found that at day 7, 66% of patients showed cure with ivermectin while in permethrin treated group 62.9% of patients cured. However statistically this difference was not significant (p value 0.428). After receiving second dose of Ivermectin at day 7 and receiving second application of topical Permethrin, patients were called for follow up at day 14. It was noted that 72.2% of patients in group A were cured as compared to 67% of patients in group B. However statistically this difference was not significant (p value 0.268). Table 2

Efficacy in both the groups was observed insignificant with p-value$=$ 0.344, 0.513 at day 7 and day 14 respectively. Table 3

DISCUSSION

Scabies is a contagious disease. Both topical and oral medications are used for its treatment. It is most commonly treated with permethrin 5% lotion or cream. Permethrin is an insecticide that kills the mites that cause scabies. Permethrin should be washed off after 8–14 hours and the application can be repeated 1–2 weeks later. Ivermectin is an oral medication shown by many clinical studies to be effective in eradicating scabies, often in a single dose. It is the treatment of choice for crusted scabies and is often used in combination with a topical agent[20].

Treatment must often involve the entire household or community to prevent reinfection. The use of antihis-

Table 1: Base line characteristic in both the groups

		Groups				p-value
		Group A		Group B		
		Count	Column N %	Count	Column N %	
Gender	Male	62	63.9%	57	58.8%	0.278
	Female	35	36.1%	40	41.2%	
Contacts with similar symptoms	Yes	75	77.3%	73	75.3%	0.433
	No	22	22.7%	24	24.7%	
Severity of Itching	Mild	25	25.8%	23	23.7%	0.815
	Moderate	61	62.9%	65	67.0%	
	Severe	11	11.3%	9	9.3%	

Table 2: Response in both the groups

		Groups				p-value
		Group A		Group B		
		Count	Column N %	Count	Column N %	
Response at Day 7	Cure	64	66.0%	61	62.9%	0.428
	Very Effective	17	17.5%	23	23.7%	
	Poor Effective	12	12.4%	12	12.4%	
	No Effect	4	4.1%	1	1.0%	
Response at Day 14	Cure	70	72.2%	65	67%	0.268
	Very Effective	17	17.5%	18	18.6%	
	Poor Effective	10	10.3%	8	8.2%	
	No Effect	0	.0%	6	6.2%	

Table 3: Efficacy (cure+very effective) in both the groups

		Groups				p-value
		Group A		Group B		
		Count	Column N %	Count	Column N %	
Efficacy at day 7	No	16	16.5%	13	13.4%	0.344
	Yes	81	83.5%	84	86.6%	
Efficacy at day 14	No	10	10.3%	14	14.4%	0.513
	Yes	87	89.7%	83	85.6%	

tamines represents one option to improve itching[21,22].

Oral ivermectin is an effective and cost comparable alternative to topical agents in the treatment of scabies infection. It has been used extensively and safely in the treatment of other parasitic infections. The safety of oral ivermectin in pregnant and lactating women and young children has yet to be established[23,24].

The lack of efficacy of a single dose of ivermectin in some patients may be due to the lack of ovicidal action of ivermectin. Ivermectin, because of its specific site of action, may not be effective against the younger stages of the parasite inside the egg because the nervous system has not yet developed[25,26]. The concentration achieved in the skin may also be variable because ivermectin is orally administered. These factors could also explain the temporal delay in complete recovery observed in the ivermectin group. Because ivermectin has not been proven to be ovicidal, a single dose of 200 µg/kg body weight may be inadequate for eradicating all the different stages of the parasite, and a higher dose or a second dose may be required within 1 to 2 weeks to achieve higher cure rates[27,28]. Although the persistence of pruritus in scabies for several weeks after

cure is not uncommon and is not necessarily predictive of treatment failure, since it is the primary symptom of scabies, a drug with a more rapid effect on relieving pruritus is much more acceptable to patients.[28]

To our knowledge there are no studies in which two doses of Ivermectin have been compared with two applications of Permethrin. In 1995, Meinking[29] et in their study had 2 follow up visits after a single dose of 200μg/kg Ivermectin. They reported 45% success with Ivermectin at 2 weeks and 100% success at 4 weeks. They too did not perform laboratory investigation for confirmation of cure.

Akhtar et al[30], in 2007 used Ivermectin in multiple doses at a dose of 300μg/kg in 60 patients, regardless of age and the reported efficacy was 100%. The reason for comparatively less percentage of our patients showing cure with Ivermectin could be the criteria we used for considering patients cured. We considered patients cured if they showed clinical cure as well as absence of mite in skin scrapings. However Akhtar et al considered patients cured if they showed clinical cure only.

When we compared our results with Usha and Nair[18] at day 7, 70% of patients in the Ivermectin group cured as compared to 97.5% in the group treated with Permethrin. Their results showed that topical Permethrin was superior to oral Ivermectin. Response of Ivermectin in terms of cure at day 7 (70%) is almost similar to that of our study (66%). In a study carried out by Khan et al.[31] 100% cure rate was seen in both treatment groups, possibly because the study was carried out on a smaller number of patients with a follow up of 2 weeks, and their ages were 12 years or above, when the activity of sebaceous glands is higher.

The limitations of our study were that Ivermectin was not given to children below 6 years of age (or <15kg) and to pregnant or lactating women. This was done so due to concerns regarding the possibility of increased penetrance of drug through the immature blood-brain barrier. We were also unable to trace all the contacts and treat them. It is suggested to perform further studies to evaluate efficacy and safety of this drug in children.

CONCLUSIONS

Although ivermectin was found to be as effective as permethrin, it offers a few outweighing advantages over topical permethrin. It is costeffective and can be administered on a large scale with better compliance, with or without supervision. It can also be given safely in patients of scabies with secondary eczematization, erosions or ulcers where topical therapies such as permethrin, lindane and benzyl benzoate can cause serious cutaneous and systemic side effects, in addition to the problem of compliance.

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