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STUDY ON CLINICAL PROFILE OF SCABIES AND COMPARISON OF EFFICACY OF TOPICAL AGENTS IN TREATMENT OF SCABIES

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ABSTRACT
Background: Scabies is an intensely pruritic mite infestation. It is a significant health problem in developing countries and remains a major issue despite available treatment modalities. **Methodology:** A prospective study was carried out over a year with 90 scabies patients at a tertiary care center after obtaining Ethical Clearance to study the clinical profile of scabies, compare the efficacy of various topical scabicidal agents, and evaluate improvement after treatment. After calculating the severity of pruritus and lesions, a detailed history was noted and randomly allotted to one of the treatment groups. Group A was treated with 1% GBHC lotion, Group B with 5% Permethrin cream, and Group C with 0.5% Ivermectin cream. Patients were advised to review in the second, third, and sixth weeks. **Observation and results:** Patients with 16-25 years of age were most susceptible. 17 out of 90 patients had secondary bacterial infections, the most common associated cutaneous disease followed by dermatophytosis. Statistically significant reduction in pruritis severity in the drug C vs drug A trial (Z = -4.810, p = <0.001) and Drug C vs drug B trial (Z= -4.795, p= <0.001). Group C (Ivermectin) causes much better improvement in itching and lesions than Group A (GBHC) and Group B (Permethrin). **Conclusion:** Among topicals, ivermectin can be preferred over permethrin and GBHC for treating scabies. Topical permethrin provides superior improvement when juxtaposed to GBHC and can be considered better than GBHC.

INTRODUCTION

Scabies is intensely pruritic and a highly contagious mite infestation. In recent years, it has been a re-emerging infection and a significant health problem in developing countries [1,2]. Scabies occur worldwide, with the highest prevalence documented in countries with hot, tropical climates [3]. In 2017, scabies was recognized by the World Health Organization as a disease of public importance and was consequently added to the list of neglected tropical diseases. An estimated 200 million people currently have scabies worldwide [4,5]. Classical scabies patients usually have generalized itching, which is aggravated at night. Secondary bacterial infection due to Streptococci and

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Staphylococcus aureus usually complicates untreated scabies [6]. Impetigo is a common complication of scabies, especially in children [7]. People with scabies are reported to be 2.8 times more likely to have impetigo [8]. Secondary bacterial skin infection with Streptococcus pyogenes can lead to septicaemia and immune-mediated disease, such as acute post-streptococcal glomerulonephritis (APSGN) & acute rheumatic fever. Scabies-related septicemia carries a substantial mortality rate [9]. Scabies requires triple treatment approach which includes treatment of the affected patients, patient's habiliment and bed linens and treatment of the close contact of the affected individuals. Various topical scabicidal agents are available. In the recent past, topical route for ivermectin delivery has been introduced but topical ivermectin has been little explored in the management of scabies. Though topical ivermectin formulations are being used for management of head lice infestation since 2012 and were given approval by FDA in 2014 for use in other cutaneous ectoparasitic conditions, there is scarcity of data of their efficacy in scabies [10].

METHODOLOGY

A prospective study was carried out over a period of one year during December 2021 to November 2022 at tertiary care centre in South India after obtaining Ethical Committee Clearance [ref no-IEC/2021/1801]. Aim of the study was to study the clinical profile of scabies and to compare the efficacy of various topical scabicidal agents and to evaluate the improvement in severity of pruritus & lesions after treatment. A total of 90 patients who were newly diagnosed with Scabies were included in the study after getting proper written consent.

Inclusion criteria: 1) Children more than 7 years and adults were included in the study. 2) Patients consenting for topical treatment and follow up 3) Untreated case of scabies.

Exclusion criteria: 1) Antenatal and lactating women. 2) Morbid illness. Detailed demographic details and history of every patient with regard to duration of itching and its aggravation at night and similar history in family members, other associated systemic and cutaneous disorders were noted.

Clinical examination was done.Visual Analogues Scale (VAS) was used to evaluate the severity of pruritus. VAS used was 10 cm line, point zero represents absence of pruritus and point 10 represents most severe pruritus. Point 1 to 3 - Mild, point 4 to 6 - Moderate, Point 7 to 10 - Severe. Severity of disease was measured in accordance to the number of lesions present. It was graded as Mild - less than or equal to 10 lesions, Moderate - 11-49 lesions, Severe - more than or equal to 50 lesions. Severity scores of 1, 2, and 3 were designated to scabies cases and recorded as mild, moderate and severe, respectively.

The patients were randomly allotted to any one of the following three treatment groups after calculating their Severity of Pruritus and Severity of lesions. Group A comprised of patients who will be given 1% GBHC lotion. Group B included patients who will be given 5% Permethrin cream Group C contained patients who will be given 0.5% Ivermectin cream. Patients were advised to come for review after 1 week for second application and in fourth week and in eighth week. Data analysis was done using SPSS. Wilcoxon signed-rank test was used for comparing the severity of pruritus and severity of lesions in three groups at various stages- 1) during the visit to the hospital for getting medicines before the second application, 2) during the first follow up, and 2) during the second follow-up.

RESULT

Children and young individuals in the age group of 16-25 were the most susceptible age group. Nearly 45 out of patients belonged to the younger age group ranging from 6-25. There was no significant difference gender wise.

Scabies was most common in urban population in our study group. Nearly 62 (68.9%) patients belonged to urban area whereas 28 (30.1%) belonged to rural area. It was most common in lower socioeconomic group according to modified kuppusamy scale. 69 patients, i.e., 76.7% gave similar history of itching and skin lesions in close contacts and family members. 20 children, 21 female and 28 male patients had history of scabies in their close contacts. 17 out of 90 patients (18.8 %) had associated secondary infections. 9 (8.88%) patients had associated dermatophyte infection, and 17 (18.8%) patients had associated secondary infection.

Assessment of treatment response: Nearly 87 % of patients in Ivermectin group had good response but 38 % of patients treated with permethrin and 6 % of GBHC group had good response to treatment. By applying Wilcoxon signed ranks test, for treatment groups at time of second application, it shows that pruritus score of treatment group C (Ivermectin group) is less compared to that of other two groups- i.e., Group A (GBHC group) and Group B (Permethrin Group) as shown in Table 1

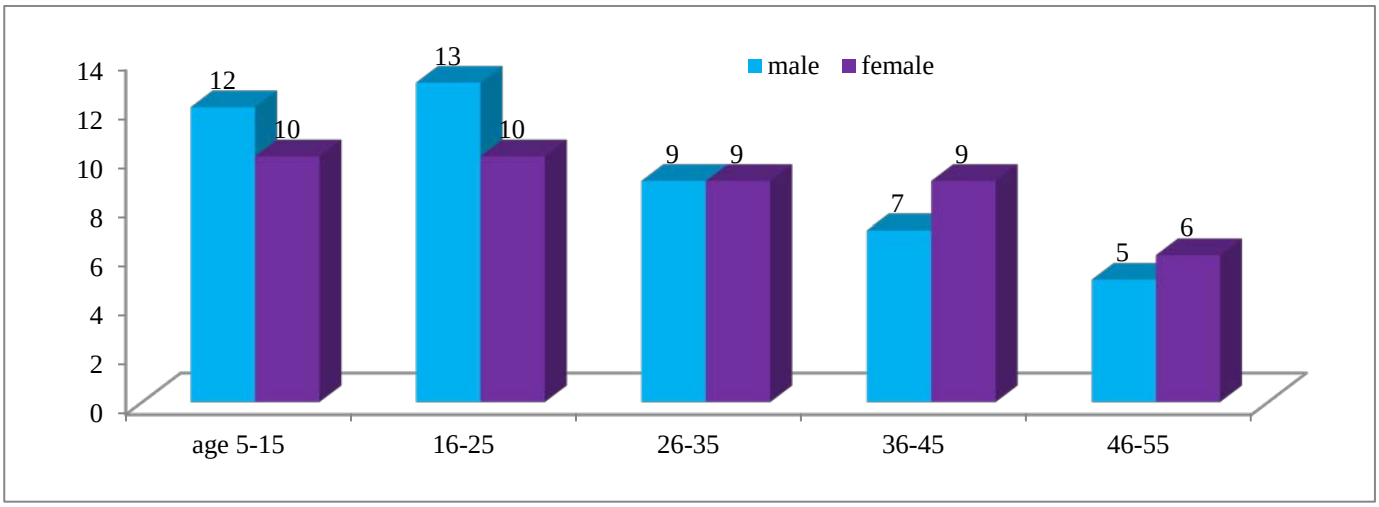

Figure 1 - Distribution of study population according to age and sex

Table 1: Wilcoxon signed ranks test for pruritus at time of the second application

Pruritus score	B – a pruritus score	C – a pruritus score	C – b pruritus score
Negative ranks	7	0	0
Positive ranks	18	0	0

By using Wilcoxon signed ranks test, for various treatment groups at time of second application, Severity of lesions score is significantly reduced in group C when compared to group A and Group B. This was statistically significant at p value of <0.0001 and with chi square value of 21.897 and with degree of freedom being 2, Table 2.

Table 2: Wilcoxon signed ranks test for lesions at time of second application

Pruritus score	B – a pruritus score	C – a pruritus score	C – b pruritus score
Negative ranks	17	26	23
Positive ranks	12	2	7

From Table 3, it is observed that there is no positive ranks on comparing Group C with both Group B and Group A, which signifies that Drug Group C causes much better improvement in pruritus when compared to that of Group A and Group B. This is statistically significant at p value of <0.001 and at chi square value of 51.185 and with degree of freedom of 2.

Table 3: Wilcoxon signed ranks test for pruritus at first follow up

Pruritus score	B – a pruritus score	C – a pruritus score	C – b pruritus score
Negative ranks	7	0	0
Positive ranks	18	0	0

At first follow up, severity of lesions score had reduced significantly in group in comparison with that of group A and Group B. It was statistically significant at p value of <0.0001 and with chi square value of 43.948 and with degree of freedom being 2, Table 4

Table 4: Wilcoxon signed ranks test for lesions at first follow up

Pruritus score	B – a pruritus score	C – a pruritus score	C – b pruritus score
Negative ranks	13	30	30
Positive ranks	5	0	0

From Table 5, at second follow up, severity of pruritus showed no positive ranks is found from the above table on comparing with group C with both Group B and Group A, which helps in concluding that Drug Group C causes comparably better

improvement in pruritus when compared to that of Group A and Group B. This is statistically significant at p value of <0.001 and at chi square value of 21.897 and with degree of freedom of 2.

Table 5: Wilcoxon signed ranks test for pruritus at second follow up

Pruritus score	B – a pruritus score	C – a pruritus score	C – b pruritus score
Negative ranks	7	30	30
Positive ranks	18	0	0

From Table 6, we can infer that drug B (Permethrin) is better than drug A (GBHC), whereas Drug C (Ivermectin) is better when compared to Drug B (permethrin) and Drug A (GBHC)

Table 6: Wilcoxon signed ranks test for lesions second follow up

Pruritus score	B – a pruritus score	C – a pruritus score	C – b pruritus score
Negative ranks	17	26	23
Positive ranks	12	2	7

There was a statistically significant difference in the severity depending on the type of drug used to the severity of leisons score, $\chi 2(2) = 49.061$, p = <0.001. Post hoc analysis with Wilcoxon signed-rank tests was conducted with a Bonferroni correction applied, resulting in a significance level set at p < 0.017. Median (IQR) perceived effect levels for drug A, drug B and drug C trial were 7,7 and 3 respectively. There were no significant differences between drug B and Drug A lesions score trials (Z = -1.957, p = 0.050). However, there was a statistically significant reduction in pruritis severity in the drug C vs drug A trial (Z = -4.810, p = <0.001) and Drug C vs drug B trial (Z= -4.795, p= <0.001)

DISCUSSION

Age of patients in our study ranged from 6 to 54 years. There was no significant difference gender wise. Amidst the study group, 18 patients were under the age of 14 years. 62 (68.9%) patients were from urban area and 28 (31.1%) patients were from rural area. Among 90 patients, forty patients (44.4%) patients belonged to Class IV socioeconomic status (according to modified Kuppuswamy scale) and 31 (34.4 %) patients belonged to Class V (according to modified Kuppuswamy scale). Scabies was most common in lower socioeconomic group in our study group and more common among urban area. The probable reason would have been overcrowding and poor sanitation and unhygienic environment.

GBHC (Gamma Benzene Hexa Chloride), member of cyclohexane family inhibits neurotransmission, induces respiratory paralysis and muscular paralysis in arthorpods and thereby causes death of mites. Permethrin, synthetic pyrethroid, disenables sodium transport across arthropods' cell membranes leading to delayed repolarization and thereby paralysis of arthropods occurs resulting in death of the organism. Ivermectin, a semisynthetic macrocyclic lactone, with broad spectrum of miticidal and acaricidal activity, acts by disrupting GABA mediated neurotransmission in peripheral muscles in invertebrates. Ivermectin does not cross Blood Brain Barrier and hence has wider safety margin.

In our study group, among 90 patients, inmates i.e., house hold contacts, family members, close contacts of nearly 69 patients (76.7%) were affected whereas among 21 patients (23.3%), inmates were not affected. In the study population, out of 90 patients, 17 patients, that is 18.8 % had associated secondary infections. 8 out of 90 (8.88%) patients had associated dermatophyte infection and 17 (18.8%) patients had associated secondary infection. This finding correlates with Heukelbach et al [6] study which states that secondary bacterial infection usually complicates untreated scabies.

Among the patients treated with ivermectin, almost everyone had marked improvement with regard to itching and severity of lesions score. This response to Ivermectin correlates with Goldust et al study [11]. Amidst patients treated with permethrin, there was a marked improvement in comparison with those treated with GBHC, but they compared adversely with those treated with Ivermectin. This response to permethrin was found to be similar with studies by Taplin et al [12] which had shown better cure with permethrin when compared to GBHC and Schultz et al [13] studies. Age and sex seemed to have no effect on the response to treatment, with patients across all age groups showing same pattern of response in all the treatment groups.

CONCLUSION

Statistically significant reduction in pruritis severity in the drug C vs drug A trial (Z = -4.810, p = <0.001) and Drug C vs drug B trial (Z= -4.795, p= <0.001). Group C (Ivermectin) causes much better improvement in itching and lesions as compared to Group A (GBHC) and Group B (Permethrin). Topical ivermectin can be preferred over topical permethrin and topical GBHC for treating scabies in terms of reducing the severity of itching and lesions. Topical permethrin provides superior improvement when juxtaposed to that of GBHC and hence can be considered as better modality of treatment when compared to GBHC. The current study has a limitation of smaller sample size and was carried out over a limited period of time. All the facts and figures mentioned here might considerably vary from those of large series covering wide range of time but cases of this study were collected from a tertiary level hospital in our country. All the available modalities of treatment were not assessed.

FINANCIAL ASSISTANCE

Nil

CONFLICT OF INTEREST

The authors declare no conflict of interest

AUTHOR CONTRIBUTION

Rajalakshmi Ramamurthy designed the entire work. Karthikeyan Selvaraj contributes to making the necessary corrections and revisions to the manuscript. The final draft was checked by both the authors.

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