



A Comparative Study Between Efficacies of Fluconazole and Ketoconazole in Tinea Versicolor

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Abstract

Background: In limited lesions of tinea versicolor topical drugs are found as effective; but in extensive cases, systemic drugs are more suitable. Both oral fluconazole and ketoconazole are usually used in Bangladesh in the management of tinea versicolor. But we have very limited comparative information regarding the efficacies of fluconazole and ketoconazole in treating tinea versicolor respectively.

Aim of the Study: The aim of this study was to compare the efficacies of fluconazole and ketoconazole in treating tinea versicolor.

Methods: This comparative observational study was conducted in the department of Skin and Venereology, 250 Baded General Hospital, Meherpur, Bangladesh during the period from May 2022 to April 2023. In total 70 patients with tinea versicolor from several age groups of either gender were enrolled as the study subjects who had continued up to the end of the full tenure of this intervention. All the patients were randomly divided into equal two groups. Patients of group 1 (n = 35), received 300 mg fluconazole as a single dose and repeated weekly for 2 weeks and patients of group 2 (n = 35), received 400 mg ketoconazole as a single dose and repeated weekly for 2 weeks. Diagnosis of tinea versicolor was made clinically by direct KOH preparation.

Results: In this study, the male-female ratio of the participants was 1.1:1. The mean age of the respondents of group 1 was 31.37 ± 3.28 years which was 30.44 ± 2.88 years in group 2. The mean duration of suffering (In year) was 4.28 ± 0.69 years in group 1 which was found as 4.74 ± 0.54 in group 2. In group 1, at one months' follow up, in assessing the clinical responses, cured, improved and unchanged cases were found as 66%, 26% and 9% respectively which statuses were found in 57%, 26% and 17% cases respectively in group 2. In assessing the mycological response at 1-month follow-up, in group 1, mycological eradication was found in 71% cases which was found among 60% cases in group 2.

Conclusion: Although, in this current study, in treating tinea versicolor, we found some superiority of fluconazole regarding the efficacy over ketoconazole, but the difference was not remarkable. Both the antifungalazole agents were found as well tolerated.

Keywords: Tinea; Versicolor; Fluconazole; Ketoconazole; Azole; Efficacy

Introduction

In limited lesions of tinea versicolor topical drugs are found as effective; but in extensive cases, systemic drugs are more suitable. Both oral fluconazole and ketoconazole are usually used in Bangladesh in the management of tinea versicolor. Fluconazole and ketoconazole, both are azole antifungals agents. Ketoconazole has 2 nitrogen atoms in its azole-ring whereas fluconazole has 3 N-atoms. Fluconazole and ketoconazole, both work by inhibiting the cytochrome P450 dependent enzyme and used widely in treating cases of dermatology. Tinea versicolor (TV) is usually caused by a type of yeast which naturally lives on human skin. Affected skin color of TV can vary from brown to red and hypo-pigmented patches may also be present [1]. Klenk, *et al.* [2] has observed that, tinea versicolor is more frequently seen in humid, warm climates or in the tropics than in dry cold zones. In another study it was also found that, 35% of the patients had the disease first time in summer which could probably because of increased sweating [3]. Tinea versicolor is most prevalent in the tropical areas where there is high temperatures, high humidity and frequent exposure to sunlight [4]. The main problem with the use of topical antifungals is the difficulty of applying creams to such a large body surface area. For this reason, TV is perhaps more easily treated with systemic agents such as ketoconazole, itraconazole and fluconazole [5]. Ketoconazole was the first oral antifungal drug to be shown to be effective in the treatment of TV. It is a substituted imidazole derivative and inhibits the biosynthesis of ergosterol a major membrane lipid of the causative yeast [6]. In many studies it was reported that, oral ketoconazole is recommended treatment for tinea versicolor [7]. On the other hand, in another study, it was reported that, fluconazole has proven efficacy in treating infections caused by *Candida albicans* [8]. Favorable pharmacokinetics of fluconazole, especially its slow elimination from the skin, allow its effective systemic administration in a variety of superficial fungal infections like tinea cruris, tinea corporis and tinea pedis [9]. The major objective of this current study was to compare the efficacies of fluconazole and ketoconazole in treating tinea versicolor.

Methodology

This comparative observational study was conducted in the department of 250 Bedded General Hospital, Meherpur, Bangladesh

during the period from May 2022 to April 2023. In total 70 patients with tinea versicolor from several age groups of either gender were enrolled as the study subjects who had continued up to the end of the full tenure of this intervention. All the patients were randomly divided into equal two groups. Patients of group 1 (n = 35) received 300 mg fluconazole as a single dose and repeated weekly for 2 weeks and patients of group 2 (n = 35) received 400 mg ketoconazole as a single dose and repeated weekly for 2 weeks. Proper written consents were taken from all the participants before data collection. The whole intervention was conducted in accordance with the principles of human research specified in the Helsinki Declaration [10] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [11]. The patients were diagnosed clinically based on scaling, erythema, pigmentation and confirmed by Wood's lamp examination and KOH microscopy [12]. As per the inclusion criteria of this study, only diagnosed cases of tinea versicolor confirmed by KOH microscopy, provided written informed consent were included. Two follow-up reports were recorded; one at 15 days and another at the end of one-month treatment. On the other hand, according to the exclusion criteria of this study, patients with known sensitivity to fluconazole and ketoconazole, chronic cases of mucocutaneous candidiasis or any serious systemic illness, immunosuppressant caused by disease or treatment were excluded. All the demographic and clinical information of the participants were recorded. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 23.0 program as per necessity. In statistical analysis, P value <0.05 was considered as the indicator of significance.

Results

In this study, all the patients were randomly divided into equal two groups. Patients of group 1 (n = 35) received 300 mg fluconazole as a single dose and repeated weekly for 2 weeks and patients of group 2 (n = 35) received 400 mg ketoconazole as a single dose and repeated weekly for 2 weeks. Among total participants, 54% were male whereas the rest 46% were female. So male participants were dominating in number and the male-female ratio of the participants was 1.1:1. The mean age of the respondents of group 1 was 31.37 ± 3.28 years which was 30.44 ± 2.88 years in group 2. The mean duration of suffering (In year) was 4.28 ± 0.69 years in group 1 which was found as 4.74 ± 0.54 in group 2. In this study, in group

1, at 15 days' follow up, in assessing the clinical responses, cured, improved and unchanged cases were found as 60%, 23% and 17% respectively which statuses were found in 51%, 29% and 20% cases respectively in group 2. Again, in group 1, at one months' follow up, in assessing the clinical responses, cured, improved and unchanged cases were found as 66%, 26% and 9% respectively which statuses were found in 57%, 26% and 17% cases respectively in group 2. In assessing the mycological response at 1-month follow-up, in group 1, mycological eradication was found in 71% cases which was found among 60% cases in group 2.

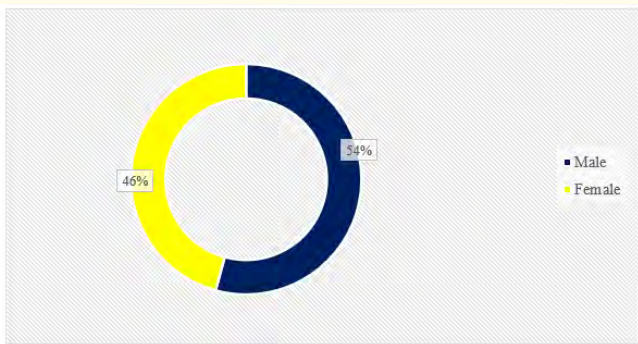


Figure 1: Ring chart showed gender wise participants distribution (N = 70).

Variables	Group 1	Group 2
	(n = 35)	(n = 35)
	Mean ± SD	
Mean age (Year)	31.37 ± 3.28	30.44 ± 2.88
Mean weight (Kg)	54.68 ± 3.47	55.71 ± 3.63
Mean duration of suffering (Year)	4.28 ± 0.69	4.74 ± 0.54
History of previous treatment	21(60.00%)	22(62.86%)

Table 1: Distribution of participants as per demographic status (N = 70).

Types	Group-A		Group-B		P value
	(n = 35)	(n = 35)	(n = 35)	(n = 35)	
Cured	21	60%	18	51%	0.092
Improved	8	23%	10	29%	
Unchanged	6	17%	7	20%	

Table 2: Distribution of patients as per clinical response after 15 days (N = 70).

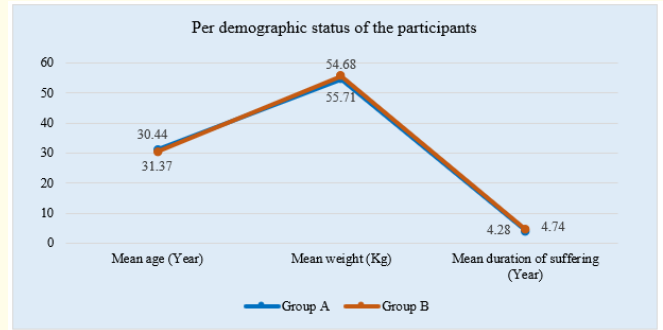


Figure 2: Line chart showed participants demographic mean value (N = 70).

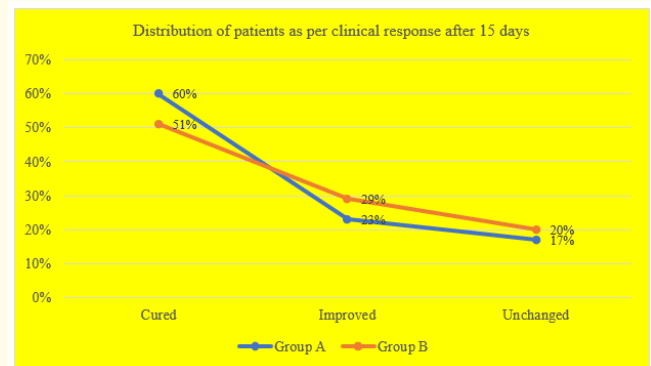


Figure 3: Bar chart showed Distribution of patients as per clinical response after 15 days (N = 70).

Types	Group-A		Group-B		P value
	(n = 35)	(n = 35)	(n = 35)	(n = 35)	
Cured	23	65%	20	57%	0.058
Improved	9	26%	9	26%	
Unchanged	3	9%	6	17%	

Table 3: Distribution of patients as per clinical response after 1 month (N = 70).

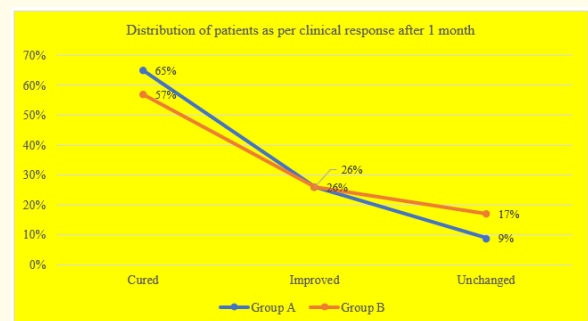


Figure 4: Bar chart showed Distribution of patients as per clinical response after 1 month (N = 70).

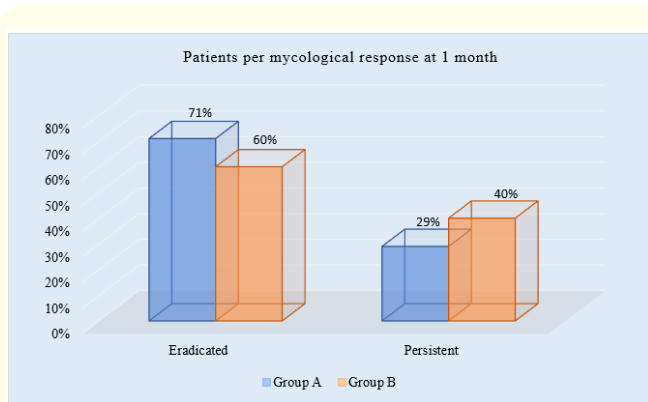


Figure 5: Bar chart showed patients as per mycological response at 1 month (N = 70).

Discussion

The aim of this study was to compare the efficacies of fluconazole and ketoconazole in treating tinea versicolor. In this study, among total participants, 54% were male whereas the rest 46% were female. So male participants were dominating in number and the male-female ratio of the participants was 1.1:1. Rao, *et al.* [13]. Maheshwariamma, and Singh, *et al.* [14]. have also found almost similar results with more prevalence of cases in males. The mean \pm SD age of the respondents of group 1 was 31.37 ± 3.28 years which was 30.44 ± 2.88 years in group 2. The mean \pm SD duration of suffering (In year) was 4.28 ± 0.69 years in group 1 which was found as 4.74 ± 0.54 in group 2. These findings are comparable with some other studies [15,16]. In this study, in group 1, at 15 days' follow up, in assessing the clinical responses cured, improved and unchanged cases were found as 60%, 23% and 17% respectively which statuses were found in 51%, 29% and 20% cases respectively in group 2. Similar results were observed in another study of Silva, *et al.* [17]. where at 1-month follow-up cure plus improvement rate was found in 90.4% and failure in 8.2% cases treated with ketoconazole; on the other hand, cure plus improvement rate was found in 94.2% and failure in 4.2% patients treated with single dose other drug ($p > 0.05$). Again, in group 1, at one months' follow up, in assessing the clinical responses, cured, improved and unchanged cases were found as 66%, 26% and 9% respectively which statuses were found in 57%, 26% and 17% cases respectively in group 2. In assessing the mycological response at 1-month follow-up, in group 1, mycological eradication was found in 71% cases which was found among 60%

cases in group 2. All these findings were in agreement with Silva, *et al.* [17]. where at 1-month follow-up eradication rate was in 88.9% and persistent in 9.7% and reinfection in 1.4 patients treated with ketoconazole; while eradication rate was in 80.3%, persistent in 14.1% and eradication with reinfection in 5.6% patients managed with other drug. Bhogal, *et al.* [18], observed mycological cure rate after 4 weeks of treatment 73.3% with ketoconazole 200mg for 10 days. All the findings of this current study may be helpful in further similar studies.

Limitation of the Study

This was a single centered study with small sized samples. Moreover, the study was conducted at a very short period of time. So, the findings of this study may not reflect the exact scenario of the whole country.

Conclusion and Recommendation

Although, in this current study, in treating tinea versicolor, we found some superiority of fluconazole regarding the efficacy over ketoconazole, but the difference was not remarkable. Both the antifungal azole agents were found as well tolerated. For getting more specific findings, we would like to recommend for conducting similar more studies in several places with larger sized samples regarding the same issue.

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