



Research Paper

## A COMPARATIVE STUDY OF EFFICACY OF TERBINAFINE AND FLUCONAZOLE IN PATIENTS OF TINEA CORPORIS

Kumar Amit<sup>1\*</sup>, Budania Navin<sup>2</sup>, Sharma Priyamvada<sup>3</sup> and Singh Monika<sup>4</sup>

\*Corresponding Author: **Kumar Amit**, ✉ : [amitdedaur@rediffmail.com](mailto:amitdedaur@rediffmail.com)

**Objectives:** This study aimed to compare the efficacy of terbinafine and fluconazole in the treatment of Tinea corporis. **Material and methods:** Total 116 tinea corporis patients who were not responding to topical antifungal therapy of 2 weeks were selected and they were randomly divided into two groups. Group-I received oral terbinafine (250 mg) daily for 4 weeks. Group-II received oral fluconazole (150 mg) once weekly for 4 weeks. Evaluation is done by assessment of target symptoms, i.e., scaling, erythema, and pruritus (as clinical score 0 to 3) and by Clinical response rates at the end of treatment. **Results:** There was a significant decrease in the clinical score beginning from baseline to 4<sup>th</sup> week in both the groups ( $P < 0.05$ ). If we compare the clinical score of both the groups after 4<sup>th</sup> week, there is slight more reduction of clinical score in group-I than of group-II ( $P > 0.05$ ). The clinical response rate of group-I at 4<sup>th</sup> week was 92.86%, whereas Clinical response rate of group-II was 82.00% ( $P > 0.05$ ). **Conclusion:** Both fluconazole and terbinafine are quite effective in the treatment of tinea corporis patients in terms of clinical cure. Terbinafine shows slightly better results than fluconazole ( $P > 0.05$ ).

**Key words:** Fluconazole, Terbinafine, Tinea corporis, Clinical response rate

### INTRODUCTION

Tinea corporis is a superficial dermatophyte infection characterized by either inflammatory or noninflammatory lesions on the glabrous skin (i.e., skin regions except the scalp, groin, palms, and soles). It is most commonly caused by *Trichophyton* species, that digest keratin in the cells of the stratum corneum.

Patients typically present with an annular patch or plaque with an advancing, raised, scaling border and central clearing. The tinea corporis infection begins as flat, scaly, and often pruritic macules that subsequently develop a raised border and begin to spread radially. As the ring expands, the central portion of the lesion often clears. This pattern leads to the formation of

<sup>1</sup> Department of Pharmacology, Major SD Singh Medical College, Farrukhabad, India.

<sup>2</sup> Department of Pharmacology, S.H.K.M. Govt. Medical College, Mewat, Haryana, India.

<sup>3</sup> Department of Pharmacology, S.N. Medical College, Agra, India.

<sup>4</sup> Major SD Singh Medical College, Farrukhabad, India.

irregular circles that gives tinea corporis its common name, ringworm.

Most patients with tinea corporis are diagnosed clinically. To avoid a misdiagnosis, identification of dermatophyte infections requires both a fungal culture on Sabouraud's agar media, and a mycological examination, consisting of a 10% to 15% KOH preparation, from skin scrapings.

Although topical antifungals may be sufficient for treatment of tinea corporis, but systemic medications are used for patients with severe infection, for infections that do not respond to topical therapy, when the infected areas are large, macerated with a secondary infection, or in immunocompromised individuals.

Common systemic antifungal agents used are oral griseofulvin, terbinafine, fluconazole and itraconazole. Azole and Allylamine agents appear to have greater efficacy and fewer side effects than oral Griseofulvin. Terbinafine and itraconazole are equally effective in treating tinea corporis (Farag *et al.*, 1994 and Parent *et al.*, 1994). An alternative is fluconazole which is given orally once a week for up to four consecutive weeks (Suchil *et al.*, 1992 and Montero and Perera, 1992). Fluconazole, a synthetic triazole derivative, is an azole antifungal agent. Terbinafine is an allylamine. It is a synthetic antifungal agent. Our study is a comparative study between fluconazole and terbinafine in terms of efficacy.

## MATERIAL AND METHODS

This prospective, parallel, open-label, randomized, comparative clinical trial was conducted in the department of pharmacology in collaboration with department of skin and venereal diseases from February 2010 to January 2011 at S N. Medical College and Associated Hospital,

Agra. Patients were randomly selected from the tinea cases of extensive tinea corporis attending skin OPD. Approval of Institutional Ethical Committee was taken to conduct the above study.

### Inclusion Criteria

Tinea corporis patients of both sexes and age between 20-45 years, patients who were not responding to topical antifungal therapy of 2 weeks, patient must be culture positive, patients from Agra or around Agra, patients do not having any other systemic disease, patients ready for therapy after knowing adverse effects.

### Exclusion Criteria

Evidence of hepatic or renal disease, pregnant females, nursing mother, age <20 years and >45 years, hypersensitivity or intolerance to treatment, patients who takes cisapride.

### Workup Before Therapy

After selecting the patient, a detailed clinical record was prepared including age, sex, address, occupation, family history, duration of the disease, size and extent of lesions, history of previous treatments. Then cases were examined in detail for local and systemic examination. After that all patients were subjected to necessary investigations which include-Hb, TLC, DLC, ESR, blood sugar, weight of patient, SGPT/SGOT, serum creatinine, urine analysis. The investigations were repeated after 2 weeks and after end of treatment.

### Methods

All the patients of tinea corporis attending to the out patients department were selected for the study, on the basis of inclusion and exclusion criteria. Total 116 patients were selected and they were randomly divided into two groups. Two

groups which were compared and evaluated are as follows:

**GROUP I (Daily Oral terbinafine):** In this group patients were given oral terbinafine (250 mg) daily at morning time after breakfast for 4 weeks.

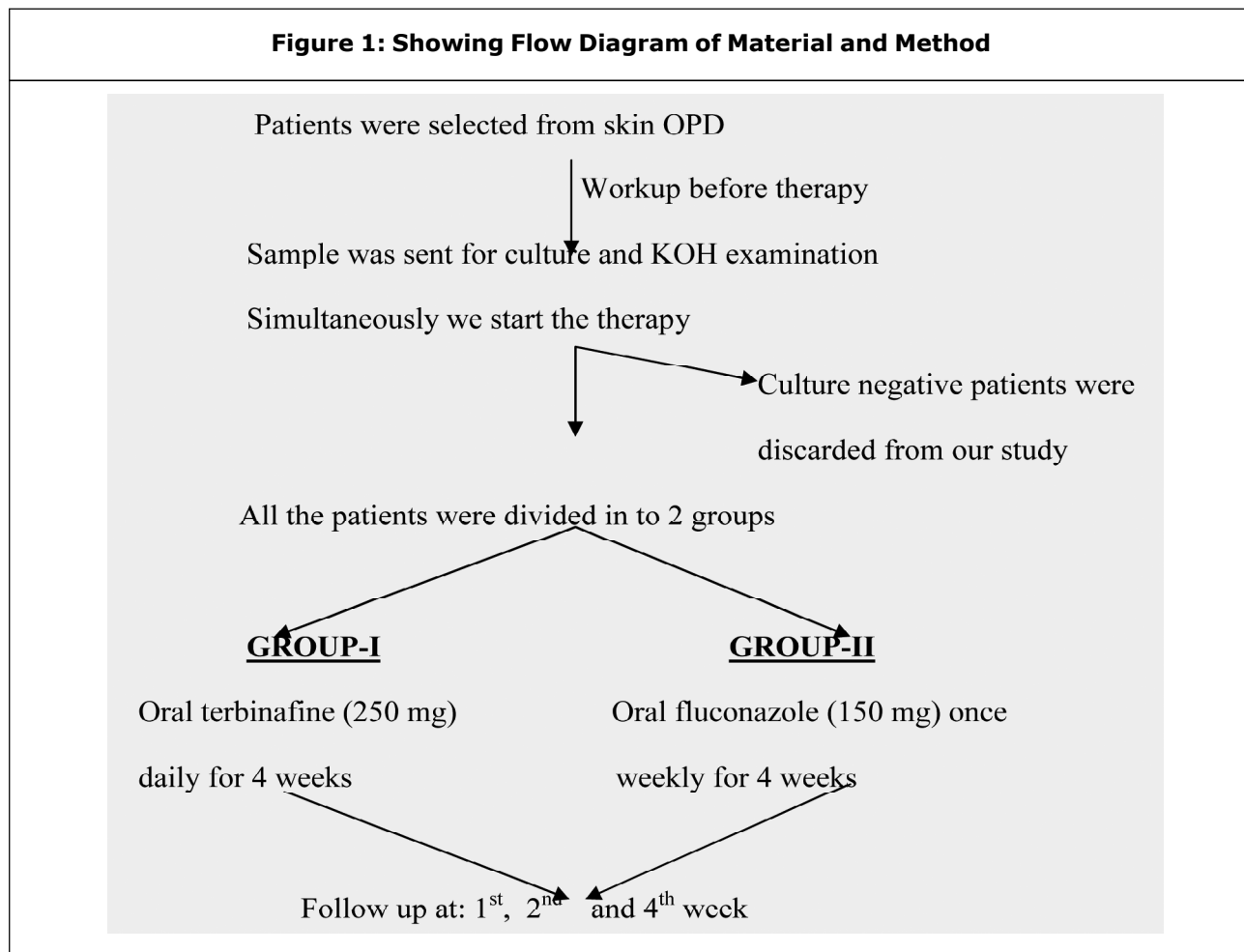
**GROUP II (Weekly Oral Fluconazole):** In this group patients were given oral fluconazole (150 mg) once weekly at morning time after breakfast for 4 weeks.

Out of 116 patients 24 patients missed during the treatment period. Therefore only 92 patients were included in the study for detail analysis (42 patients in the terbinafine group and 50 patients in the fluconazole group) (Figure 1).

**Follow Up and Evaluation**

Patients were followed at 1<sup>st</sup> week, 2<sup>nd</sup> week and 4<sup>th</sup> week (after the end of treatment). Evaluation is done by clinical assessment in terms of clinical score and clinical response rates. The clinical signs and symptoms assessed were scaling, erythema, and pruritus. These three were regarded as target symptoms. The signs and symptoms were rated as clinical score 0 to 3: 0, absent; 1, mild; 2, moderate; or 3, severe, for the above three target symptoms. At the global clinical evaluations, we rated the clinical findings as: A. Healed (absence of signs and symptoms), B. Markedly improved (>50% clinical improvement), C. Considerable residual lesions (< 50% clinical improvement), D. No change, E. Worse.

**Figure 1: Showing Flow Diagram of Material and Method**



**Clinical response rates** : A clinical response to treatment was defined as a rating of healed or markedly improved.

### Statistical Analysis

The data was analyzed using online statistical calculators. Wilcoxon Signed-Ranks Test was used to compare the paired data of same group and Mann-Whitney Test was used to compare the data of both groups.  $P < 0.05$  was considered as statistically significant.

## RESULTS

In present study, total of 92 patients of tinea corporis of age group 20-45 years were analyzed. Among them 42 patients were given daily therapy of terbinafine (group I) and 50 patients were given weekly therapy of fluconazole (group II). A detailed analysis revealed that the disease was more common in males, the male to female ratio being 1.36:1, i.e., 57.61% were males and 42.39% were females (Group I-1.47:1, Group II-1.27:1). The

mean age of the sample was  $30.36 \pm 6.64$  years (Group I-  $30.40 \pm 6.69$  years and Group II-  $30.32 \pm 6.67$  years). The maximum number of patients, i.e., 51 (55.43%) were in age group 21-30 years. Lower extremities were the most common site of involvement, i.e., 51 patients (55.43%). The most common causative organism reported was *T. rubrum* 51 cases (55.43%) (Tables 1 and 2).

The mean clinical score at baseline was  $6.42 \pm 1.52$  (Group I-  $6.43 \pm 1.50$  and Group II-  $6.42 \pm 1.55$ ). There was significant decrease in the clinical score beginning from baseline to 4<sup>th</sup> week in both the groups ( $P < 0.05$ ). If we compare the clinical score of both the groups after 4 week there is slight more reduction of clinical score in group-I than of group-II ( $P > 0.05$ ).

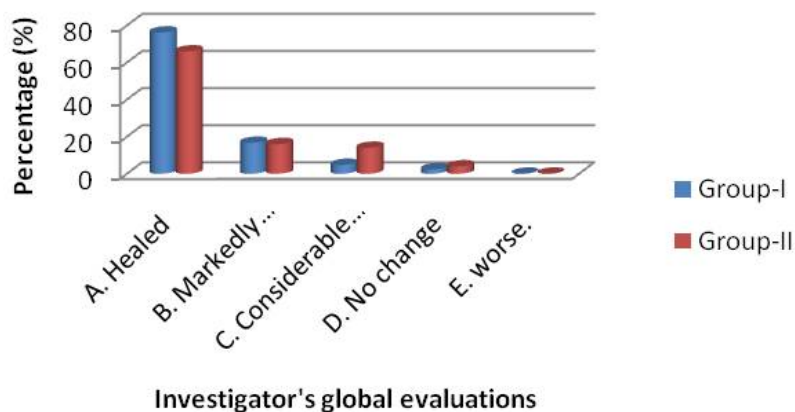
The clinical response rate of group-I at 4<sup>th</sup> week was 92.86%, whereas of group-II was 82.00%. There is slight more increase in clinical response rate in group-I than of group-II ( $P > 0.05$ ) (Figure 2).

**Table 1: Clinical Scores in Group-I and Group-II**

	Group-I (n <sub>1</sub> =42)				Group-II (n <sub>2</sub> =50)			
	At Baseline	At 1 <sup>st</sup> wk	At 2 <sup>nd</sup> wk	At 4 <sup>th</sup> wk	At Baseline	At 1 <sup>st</sup> wk	At 2 <sup>nd</sup> wk	At 4 <sup>th</sup> wk
Mean $\pm$ SD	6.43 $\pm$ 1.50	5.31 $\pm$ 1.92	3.21 $\pm$ 2.20	0.79 $\pm$ 1.76	6.42 $\pm$ 1.55	5.90 $\pm$ 1.79	5.18 $\pm$ 1.85	1.28 $\pm$ 2.29
Z value		5.16	5.51	5.58		4.10	5.08	6.03
P value		<0.05	<0.05	<0.05		<0.05	<0.05	<0.05

**Table 2: Clinical Scores in Group-I Vs. Group-II**

	At Baseline		At 1 <sup>st</sup> wk		At 2 <sup>nd</sup> wk		At 4 <sup>th</sup> wk	
	Group-I	Group -II	Group -I	Group -II	Group -I	Group -II	Group -I	Group -II
Mean $\pm$ SD	6.43 $\pm$ 1.50	6.42 $\pm$ 1.55	5.31 $\pm$ 1.92	5.90 $\pm$ 1.79	3.21 $\pm$ 2.20	5.18 $\pm$ 1.85	0.79 $\pm$ 1.76	1.28 $\pm$ 2.29
Z value	0.01		1.36		4.32		0.91	
P value	> 0.05		>0.05		<0.05		>0.05	

**Figure 2: Clinical Response Rates at the End of Treatment in Group I Vs. Group II**

## DISCUSSION

Tinea corporis occurs worldwide and is relatively frequent, but its incidence is higher in tropics and subtropics. Males are infected more than females. Infection can occur from direct or indirect contact with skin and scalp lesions of infected persons or animals.

Topical therapies for treatment of tinea corporis include terbinafine, butenafine, econazole, miconazole, ketoconazole, clotrimazole, and ciclopirox. Topical formulations may eradicate smaller areas of infection, but oral therapy may be required where larger areas are involved or where infection is chronic or recurrent (Gupta *et al.*, 2003). Oral itraconazole, terbinafine, and fluconazole have been used successfully in the treatment of tinea corporis/ tinea cruris.

Out of 92 patients, 53 were male and 39 were female. A predominance of male patients was seen. The overall male to female ratio in the study was 1.36:1, i.e., 57.61% were males and 42.39% were females. In a study by Acharya *et al.* (1995), the male to female ratio was 1.86, i.e., 65.00%

were males and 35.00% were females (Acharya *et al.*, 1995).

The mean age of patients was  $30.36 \pm 6.64$  years. The youngest person was of 21 years and the eldest was of 45 years. The maximum number of patients, i.e., 51 (55.43%) were in age group 21-30 years and the least number of patients, i.e., 8 (8.70%) belongs to age group between 41-45 years. In a study by Decroix *et al.* (1997), the mean age of tinea corporis/ tinea cruris patients was 39.7 years (Decroix *et al.*, 1997).

In the present study the most common causative organism isolated after culture report was *T. rubrum*, 51 cases (55.43%) followed by *T. tonsurans*, 20 cases (21.74%), *M. canis*, 11 cases (11.96%) and *T. Mentagrophytes*, 10 cases (10.87%). In a research study conducted by Venkatesan *et al.* shows *T. rubrum* (69.6%) was the major causative species isolated, followed by *T. mentagrophytes* (28.2%) and *M. gypseum* (2.2%) from tinea corporis patients (Venkatesan *et al.*, 2007).

In the present study the mean clinical score at baseline was  $6.42 \pm 1.52$  (Group I-  $6.43 \pm 1.50$  and Group II-  $6.42 \pm 1.55$ ). The maximum number of patients, i.e., 21 (22.82%) were in the score of 6 (Group I-10 patients, i.e., 23.81% and Group II-11 patients, i.e., 22.00%). The minimum number of patients, i.e., 9 (9.78%) were in the score of 9 (Group I- 4 patients, i.e., 9.52% and Group II-5 patients, i.e., 10.00%). There was significant decrease in the clinical score beginning from baseline to 4<sup>th</sup> week in both the groups ( $P < 0.05$ ). After 4 week of therapy the maximum number of patients, i.e., 65 (70.65%) were in the score of zero (Group I- 32 patients, i.e., 76.19% and Group II-33 patients, i.e., 66%). If we compare the clinical score of both the Groups after 4 week there is slight more reduction of clinical score in Group-I than of Group-II. The difference between these two clinical scores was not statistically significant ( $P > 0.05$ ).

The clinical response rate of Group-I at 4<sup>th</sup> week was 92.86%, whereas, of Group-II was 82.00%. There is slight more increase in clinical response rate in Group-I than of modality-II, but the difference between these two clinical response rates was not statistically significant ( $P > 0.05$ ). In an open, non-comparative trial by Suchil *et al.* employing once weekly dosing of fluconazole 150 mg for 1 to 4 weeks for tinea corporis and tinea cruris, clinical cure rate was 92% with long-term clinical cure rate of 88% (Suchil *et al.*, 1992).

Faergemann *et al.* compared fluconazole 150 mg once a week with griseofulvin 500 mg once a day for 4-6 weeks in the treatment of tinea corporis and tinea cruris. In the fluconazole group, 74% (80 out of 114) were clinically cured; in the griseofulvin group, 62% (72 out of 116) were

likewise without symptoms. Fluconazole once a week for 6 weeks was both clinically and mycologically effective in the treatment of tinea corporis and tinea cruris (Faergemann *et al.*, 1997).

In a study by Voravutinon V. the 250 mg of oral terbinafine once daily or 500 mg of griseofulvin once daily for 2 weeks. The results after 6 weeks follow-up, showed the mycological cure in terbinafine and griseofulvin group was 87.1 and 54.8%, respectively. The clinical response of the terbinafine group was also significantly higher than in the griseofulvin group (Voravutinon, 1993).

## CONCLUSION

Tinea corporis is a common problem encountered in dermatology practice. It is more common in males than females. It mainly involves Lower extremities and trunk. *T. rubrum* is the most common causative organism. Both fluconazole and terbinafine are quite effective in the treatment of tinea corporis patients in terms of clinical cure. Terbinafine shows slightly better results than fluconazole but the difference between these two is not statistically significant ( $P > 0.05$ ). The lower cost and once weekly schedule of fluconazole may favor patient compliance with lesser number of drop-outs.

## REFERENCES

1. Acharya K M, Mukhopadhyay A, Thakur R K, Mehta T, Bhuptani N and Patel R (1995), "Itraconazole versus griseofulvin in the treatment of tinea corporis and tinea cruris", *Indian J Dermatol Venereol Leprol*, Vol. 61, pp. 209-11.
2. Decroix J, Fritsch P, Picoto A, Thürlimann W and Degreef H (1997), "Short-term

- itraconazole versus terbinafine in the treatment of superficial dermatomycosis of the glabrous skin (tinea corporis or cruris)", *Eur J Dermatol*, Vol. 7, pp. 353-7.
3. Faergemann J, Mork N J, Haglund A and Odegard T (1997), "A multi-centre (double-blind) comparative study to assess the safety and efficacy of fluconazole and griseofulvin in the treatment of tinea corporis and tinea cruris", *Br J Dermatol*, Vol. 136, pp. 575-7.
  4. Farag A, Taha M and Halim S (1994), "One-week therapy with oral terbinafine in cases of tinea cruris/corporis", *Br J Dermatol*, Vol. 131, pp. 684-6.
  5. Gupta AK, Chaudhry M and Elewski B (2003), "Tinea corporis, tinea cruris, tinea nigra, and piedra", *Dermatol Clin*, Vol. 21, pp. 395-400.
  6. Montero-Gei F and Perera A (1992), "Therapy with fluconazole for tinea corporis, tinea cruris, and tinea pedis", *Clin Infect Dis*, Vol. 14, pp. 77-81.
  7. Parent D, Decroix J and Heenen M (1994), "Clinical experience with short schedules of itraconazole in the treatment of tinea corporis and/or tinea cruris", *Dermatology*, Vol. 189, pp. 378-81.
  8. Suchil P, Gei F M, Robles M, Perera-Ramirez A, Welsh O and Male O (1992), "Once-weekly oral doses of fluconazole 150 mg in the treatment of tinea corporis/cruris and cutaneous candidiasis", *Clin Exp Dermatol*, Vol. 17, pp. 397-401.
  9. Venkatesan G, Ranjit Singh A J A, Murugesan A G, Janaki C and Gokul Shankar S (2007), "Trichophyton rubrum – the predominant etiological agent in human dermatophytoses in Chennai", *India Afr J Microbiol Res*, pp. 9-12.
  10. Voravutinon V (1993), "Oral treatment of tinea corporis and tinea cruris with terbinafine and griseofulvin: a randomized double blind comparative study", *J Med Assoc Thai*, Vol. 76, pp. 388-93.