Original Article

Efficacy of Terbinafine Versus Itraconazole in the Treatment of Tinea Corporis

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Abstract

Background: Tinea corporis, sometimes referred to as 'ringworm,' is a superficial illness caused by dermatophytes that affects the skin.

Objective: To compare the efficacy of terbinafine versus Itraconazole in the treatment of tinea corporis.

Methods: This Randomized Control Trail was conducted at Department of Dermatology, DHQ Hospital, Sheikhupura, during the duration of July 2023 till December 2023. Total 50 cases (25 in both groups) with Tinea corporis were included. Then patients were randomly divided into two groups. In group A, patients were given terbinafine. In group B, patients were given itraconazole. Then, the patients were followed-up for 2, 4, 6 and 8 weeks. On each visit, patients were examined for complete resolution of tinea, by using total body surface area index and they were assessed for resolution of lesions. All the data was recorded in proforma and then entered & analyzed through SPSS version 26.

Results: In the terbinafine group, the mean age of the patients was 35.16 ± 8.76 years. In the itraconazole group, the mean age of the patients was 28.36 ± 10.65 years. In the terbinafine group, there were 15 (60%) males and 10 (40%) females. Whereas, in the itraconazole group, there were 8 (32%) males and 17 (68%) females. Moreover, in the terbinafine group, the baseline BSI score was 6.44 ± 3.19 and this score was reduced to 3.64 + 2.11 after 4 weeks of treatment. In this group the efficacy (complete cure within 4 weeks) was achieved in 6 (24%) cases. On the other hand, in the itraconazole group, the baseline BSI score was 7.20 ± 2.99, which was reduced to 1.75 + 0.50 after 4 weeks of treatment and the efficacy (complete cure within 4 weeks) was achieved in 13(52%) cases in this group.

Conclusion: We found that itraconazole has better efficacy than terbinafine for tinea corporis. Thus, in future, itraconazole can be a drug of choice for such cases.

Keywords: Terbinafine, Itraconazole, tinea corporis, topical treatment, body surface area.

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Introduction

Tinea corporis, sometimes referred to as 'ringworm,' is a superficial illness caused by dermatophytes that affects the skin. It typically occurs on regions of the body other than the hands, feet, scalp, bearded areas, face, groin, and nails.[1] Tinea corporis is usually caused by dermatophytes from the genera Trichophyton, Microsporum, and Epidermophyton.[1-3] Tinea corporis is the prevailing form of dermatophytosis. Tinea corporis is prevalent throughout, however it is particularly prominent in tropical areas.[4] The predicted lifetime probability of getting tinea corporis is 10–20%. Tinea corporis primarily affects individuals in the post-pubertal stage of childhood and early adulthood.[5,6] Topical antifungals are the recommended therapy for tinea corporis, and there is evidence supporting their effectiveness compared to the use of a placebo.[7] Randomized control studies provide evidence for the effectiveness of systemic therapy with oral antifungal medications.[8,9] Terbinafine functions by suppressing the activity of the enzyme squalene epoxidase, which plays a crucial role in the pro-

duction of ergosterol, a vital component of the fungal cell wall. The development of resistance to terbinafine is mostly caused by specific genetic changes, known as point mutations, in the target gene called squalene epoxidase.[10]

Tinea corporis is a common skin problem. Several topical treatments had been proposed before. Terbinafine is prescribed in routine. But itraconazole is also reported to be highly efficient in achieving cure from tinea corporis.[11] Also well-versed research is not conducted before in the local population. Therefore, we conducted this trial to find a more appropriate way to manage tinea corporis with higher chances of success within a short period of time. This would also help to improve our practice and to attain evidence for local practice.

Methods

This randomized controlled trial was conducted at the Department of Dermatology, DHQ Hospital, Sheikhupura from July 2023 December 2023 after obtaining approval from the ethical committee (No. 7433/HR/DHQ). Sample size of 50 cases (25 in both groups) was calculated by keeping 5% significance level, 90% power of study and percentage of efficacy i.e. 23.4% with terbinafine and 76.6% with itraconazole.[11] Patients were enrolled who fulfilled the selection criteria below by applying non-probability, consecutive sampling technique.

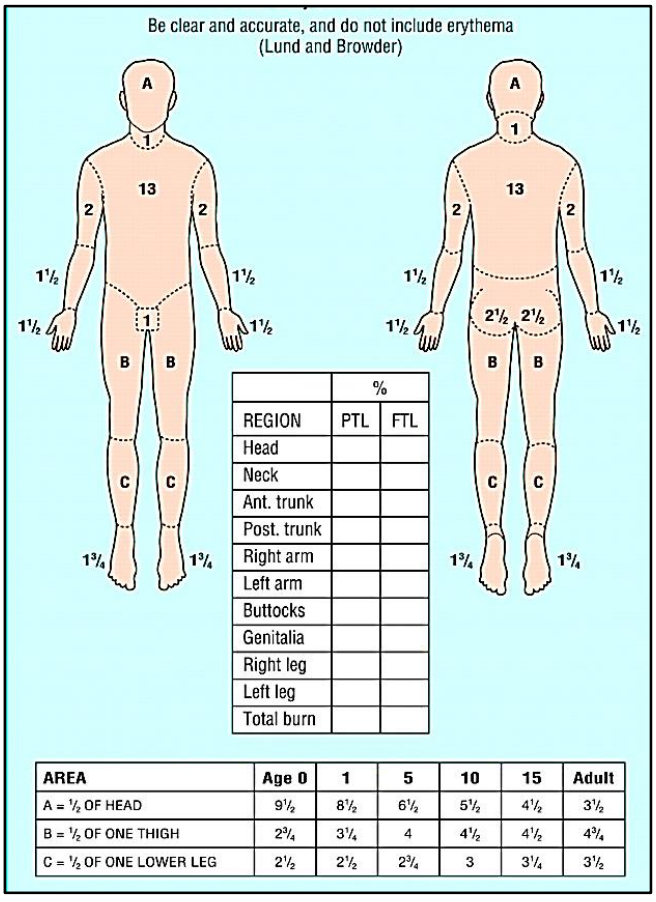
Inclusion Criteria

Patients of either gender with age ranging from 15 to 60 years, either gender, diagnosed with Tinea corporis were enrolled.

Exclusion Criteria

Pregnant females, patients with known allergy to trial drugs, already received trial treatment, diabetics or other skin allergies or infection at tinea site, were excluded from the study.

Informed consent and demographics including age, gender, duration of symptoms, previous history, occupation, history of receiving any steroidal treatment were noted. Then patients were randomly divided into two groups using a random number table. In group A, patients were given 250 mg oral terbinafine, once daily. In group B, patients were given 100 mg oral itraconazole, twice daily. Then patients were called on follow-up on regular intervals of 2, 4, 6 and 8 weeks. On each visit, patients were examined for resolution of tinea lesions by using the formula of total body surface area index (BSI). Patients who get cured within 4 weeks, were considered as efficacy. All the data was recorded in proforma and then entered & analyzed through SPSS version 26. Both groups were compared for mean BSI score by using independent samples t-test and for efficacy by using chi-square test. P-value ≤ 0.05 was kept as significant.



	%	
REGION	PTL	FTL
Head		
Neck		
Ant. trunk		
Post. trunk		
Right arm		
Left arm		
Buttocks		
Genitalia		
Right leg		
Left leg		
Total burn		

AREA	Age 0	1	5	10	15	Adult
A = ½ OF HEAD	9½	8½	6½	5½	4½	3½
B = ½ OF ONE THIGH	2¾	3¼	4	4½	4½	4¾
C = ½ OF ONE LOWER LEG	2½	2½	2¾	3	3¼	3½

Figure 1: Total Body Surface Area Index.

Results

In the terbinafine group, the mean age of the patients was 35.16 ± 8.76 years. Whereas, in the itra-

conazole group, the mean age of the patients was 28.36 ± 10.65 years. In the terbinafine group, there were 15 (60%) males and 10 (40%) females. In the itraconazole group, there were 8 (32%) males and 17 (68%) females. In terbinafine group, the mean duration of symptoms was 3.38 ± 2.92 months. In itraconazole group, the mean duration of symptoms was 9.44 ± 8.42 months. In terbinafine group, there were 4 (16%) students, 10 (40%) were housewives, 8 (32%) were labor or worker, and 3 (12%) were rickshaw drivers. In itraconazole group, 1 (4%) student, 14 (56%) were housewives, 1 (4%) was labor or worker, 1 (4%) was rickshaw drivers, 3 (12%) were employed, 2 (8%) were unemployed and 3 (12%) were doing business. In terbinafine group, 11 (44%) came from rural areas while 14 (56%) urban areas. In itraconazole group, 9 (36%) came from rural areas while 16 (64%) urban areas. In terbinafine group, 19 (76%) belonged to low socioeconomic status and 6 (24%) belonged to middle class status. In itraconazole group, 15 (60%) belonged to low socioeconomic status and 10 (40%) belonged to middle class status. In terbinafine group, 19 (76%) cases presented during summer season while 6 (24%) cases presented during autumn season. In itraconazole group, 16 (64%) cases presented during summer season while 9 (36%) cases presented during autumn season. In terbinafine group, 14 (56%) cases already received previous treatment for tinea. In itraconazole group, 23 (92%) cases already received previous treatment for tinea. In terbinafine group, 11 (44%) cases had history of using topical steroids. In itraconazole group, 11 (44%) cases had history of using topical steroids (Table 1).

Table 1: Baseline characteristics of patients (n = 50).

Variable	Terbinafine	Itraconazole
n	**25**	**25**
Age (years)	**35.16 ± 8.76**	**28.36 ± 10.65**
Gender		
Male	15 (60%)	8 (32%)
Female	10 (40%)	17 (68%)
Duration of symptoms (in months)	3.38 ± 2.92	9.44 ± 8.42
Occupation		
Student	4 (16%)	1 (4%)
Housewife	10 (40%)	14 (56%)
Laborer / worker	8 (32%)	1 (4%)
Rickshaw driver	3 (12%)	1 (4%)
Employ	0 (0%)	3 (12%)
Unemployed	0 (0%)	2 (8%)
Business	0 (0%)	3 (12%)
Residence		
Rural	11 (44%)	9 (36%)
Urban	14 (56%)	16 (64%)
Socioeconomic status		
Low	19 (76%)	15 (60%)
Middle	6 (24%)	10 (40%)
High	0 (0%)	0 (0%)
Season of presentation		
Summer	19 (76%)	16 (64%)
Autumn	6 (24%)	9 (36%)
Previously treated	14 (56%)	23 (92%)
Topical steroids used	11 (44%)	11 (44%)

In our study, we found that in the terbinafine group, the baseline BSI score was 6.44 ± 3.19, which was reduced to 3.64 + 2.11 after 4 weeks. Moreover, the efficacy (complete cure within 4 weeks) was achieved in 6 (24%) cases in this group. Whereas, In the itraconazole group, the baseline BSI score was 7.20 ± 2.99, which was reduced to 1.75 + 0.50 after 4 weeks. The efficacy (complete cure within 4 weeks) was achieved in 13(52%) cases in this group. However, In the terbinafine group, the BSI score after 6 weeks was 3.67 ± 1.37 and after 8 weeks was 1.20 ± 0.45. In the itraconazole group most patients cured within 4 weeks. At 6th week, 100% of patients were completely cured. The difference in both groups at 2nd week and 4th week was significant ($p<0.05$) (Table 2).

Discussion

Physicians must acquaint themselves with the etiology and management of tinea corporis because of its prevalence and the potential for other

circular skin lesions to imitate this fungal illness.[12,13] Human infection may occur by direct contact with an infected person, an infected animal (especially domestic dogs or cats), contaminated objects, or contaminated soil.[14,15] Infection may be acquired by the transmission of dermatophytes from another site of infection, such as tinea capitis, tinea pedis, or onychomycosis.[15,16] There has been an increase in the occurrence of tinea corporis that does not respond to terbinafine therapy in recent years.[8,10,17-19] Insufficient dose, failure to follow treat ment instructions, and misuse of over-the-counter topical products that include both antifungal agents and corticosteroids may potentially play a role.[8]

Table 2: Comparison of outcome in both groups during follow-up

	Group		p-value
	Terbinafine	Itraconazole	
BSI score at baseline	6.44 ± 3.19	7.20 ± 2.99	0.389
BSI score after 2 weeks	4.58 ± 2.82	2.64 ± 1.78	0.018
Completely cured after 2 weeks	6 (24%)	7 (28%)	0.073
BSI score after 4 weeks	3.64 ± 2.11	1.75 ± 0.50	0.107
Completely cured after 4 weeks	6 (24%)	13 (52%)	0.041
BSI score after 6 weeks	3.67 ± 1.37	-	NA
Completely cured after 6 weeks	5 (20%)	4 (16%)	>0.999
BSI score after 8 weeks	1.20 ± 0.45	-	NA
Completely cured after 8 weeks	0 (%)	0 (0%)	NA
Relapse	4 (16%)	1 (4%)	0.1574
Persistent	4 (16%)	0 (0%)	0.1179

In our study, the baseline BSI score was 6.44 ± 3.19 in the terbinafine group, which was reduced to 3.64 + 2.11 after 4 weeks while in the itraconazole group 1.75 + 0.50 after 4 weeks. The efficacy (complete cure) was significantly better with itraconazole (52%) as compared to terbinafine (24%, $p<0.05$). While more relapses were observed with terbinafine (16%) than itraconazole (4%), however, statistically it was insignificant ($p>0.05$).

Singh et al,[11] also conducted a randomized trial and found that after 4 weeks, complete cure was achieved in 4.3%, and 17% with terbinafine 250 mg and itraconazole 200, respectively ($P < 0.001$). After 8 weeks, a total cure rate of 23.4% was seen with terbinafine 250 mg, whereas a cure rate of 76.6% was reached with itraconazole 200 ($P < 0.001$). Therefore, itraconazole exhibited significantly higher cure rates compared to terbinafine at both the 4-week and 8-week time points. Majid et al,[20] documented a 65% success rate with a daily dosage of 250 mg of terbinafine for a duration of 2 weeks. Conversely, Singh and Shukla, [21] observed a reduced success rate of 30% following a 4-week treatment period.[20,21] Bhatia et al,[22] documented a therapeutic success rate of 74% for terbinafine. Babu et al,[23] conducted a retrospective analysis where 80% of patients had a greater than 75% improvement when treated with a daily dose of terbinafine 500 mg. There seems to be no further advantage in using multidrug treatment or increasing the dosage.

According to a 2014 Cochrane analysis, terbinafine and naftifine are both effective therapies with minimal minor side effects.[24] Topical antifungal medications including itraconazole, fluconazole, and terbinafine are often well-tolerated. Side effects are few, with the exception of rare cases of contact dermatitis. Systemic antifungal medication is necessary in cases when the lesion is widespread, deeply rooted (such as Majocchi granuloma), recurring, long-lasting, or not responding to topical antifungal treatment. It is also recommended for patients with weakened immune systems or when there are several lesions in different areas of the body.[2,25,26]

Our research found that the rate of recurrence was 16% in cases treated with terbinafine and 4% in instances treated with itraconazole. However, the difference in relapse rates between the two treatments was not statistically significant ($p>0.05$). In their study, Majid et al, discovered that during the 12-week follow-up period, an additional 22 patients had a recurrence of their condition after using terbinafine. These patients had previously achieved both clinical and myco-

logical cure at the conclusion of their terbinafine medication. Therefore, only 43% of patients were able to attain a lasting clinical and mycological recovery after a 4-week course of oral terbinafine therapy. The majority of relapses (72.7%) occurred more than 8 weeks following the conclusion of therapy.[20]

The common side effects of terbinafine listed in different studies are nausea, vomiting, diarrhea, abdominal pain, myalgia and arthralgia, liver injury, drug reaction including urticaria and Steven Jhonson Syndrome. Among Itraconazole; dry mouth, loss of appetite, mood change, muscle cramps, headaches, heartburn, stomach pain, bloating, depression and skin reactions are the common side effects. In our study, we found that terbinafine was well tolerated by patients. However, among the Itraconazole group, the commonest side effects were gastrointestinal symptoms, stomach pain and bloating. However, these symptoms were relieved, when they were advised to take medication in between their meals. Cost of therapy is more with itraconazole but because terbinafine has a higher failure rate and duration of treatment is longer with terbinafine so we can conclude that the cost difference between these two drugs is reduced.

Conclusion

Our findings consist of the fact that itraconazole has better efficacy than terbinafine for tinea corporis. Thus, in future, itraconazole can be a drug of choice for such cases and can be recommended to use as first line treatment, instead of going for less effective treatments. However, further trials should be done to confirm the evidence.

Ethical Approval: This study was approved by ethical committee of DHQ Hospital, Sheikhupura (Vide No. 7433/HR/DHQ).

Conflict of Interest: There was no conflict of interest to be declared by author.

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Author's Contribution:

SH: Conception & design, acquisition of data, analysis & interpretation of data, drafting of article, critical revision of the article, final approval of the version to be published.

References

1. Hsu S, Le EH, Khoshevis MR. Differential diagnosis of annular lesions. Am Fam Physician. 2001; 64(2):289-97.
2. Sahoo AK, Mahajan R. Management of tinea corporis, tinea cruris, and tinea pedis: A comprehensive review. Indian Dermatol Online J. 2016;7(2): 77.
3. Surendran K, Bhat RM, Boloor R, Nandakishore B, Sukumar D. A clinical and mycological study of dermatophytic infections. Indian Dermatol Online J. 2014;59(3):262.
4. Ebrahimi M, Zarrinfar H, Naseri A, Najafzadeh MJ, Fata A, Parian M, et al. Epidemiology of dermatophytosis in northeastern Iran; A subtropical region. Curr Med Mycol. 2019;5(2):16.
5. Gupta AK, Venkataraman M, Quinlan EM. New antifungal agents and new formulations against dermatophytes. Dermatophytes and Dermatophytoses. 2021:433-71.
6. Leung A, Barankin B. An itchy, round rash on the back of an adolescent's neck. Consult Pediatr. 2014;13:466-9.
7. Rajagopalan M, Inamadar A, Mittal A, Miskeen AK, Srinivas C, Sardana K, et al. Expert consensus on the management of dermatophytosis in India (ECTODERM India). BMC Dermatol. 2018;18(1):1-11.
8. Bhatia A, Kanish B, Badyal DK, Kate P, Choudhary S. Efficacy of oral terbinafine versus itraconazole in treatment of dermatophytic infection of skin–a prospective, randomized comparative study. Indian J Pharmacol. 2019;51(2):116.
9. Sharma P, Bhalla M, Thami GP, Chander J. Evaluation of efficacy and safety of oral terbinafine and itraconazole combination therapy in the management of dermatophytosis. J Dermatolog Treat. 2019.
10. Singh A, Masih A, Khurana A, Singh PK, Gupta M, Hagen F, et al. High terbinafine resistance in Trichophyton interdigitale isolates in Delhi, India harbouring mutations in the squalene epoxidase gene. Mycoses. 2018;61(7):477-84.
11. Singh SK, Subba N, Tilak R. Efficacy of Terbinafine and Itraconazole in Different Doses and in Combination in the Treatment of Tinea Infection: A Randomized Controlled Parallel Group Open Labeled Trial with Clinico-Mycological Correlat-

ion. Indian Dermatol Online J. 2020;65(4):284-9.
12. Alter SJ, McDonald MB, Schloemer J, Simon R, Trevino J. Common child and adolescent cutaneous infestations and fungal infections. Curr Probl Pediatr Adolesc Health Care. 2018;48(1):3-25.
13. Leung AK, Hon KL, Leong KF, Barankin B, Lam JM. Tinea capitis: an updated review. Recent Pat Inflamm Allergy Drug Discov. 2020;14(1):58-68.
14. Nenoff P, Krüger C, Ginter-Hanselmayer G, Tietz HJ. Mycology–an update. Part 1: Dermatomycoses: causative agents, epidemiology and pathogenesis. JDDG: Journal der Deutschen Dermatologischen Gesellschaft. 2014;12(3):188-210.
15. Leung AK, Lam JM, Leong KF. Childhood solitary cutaneous mastocytoma: clinical manifestations, diagnosis, evaluation, and management. Current pediatric reviews. 2019;15(1):42-6.
16. Leung AK, Lam JM, Leong KF, Hon KL, Barankin B, Leung AA, et al. Onychomycosis: an updated review. Recent Pat Inflamm Allergy Drug Discov. 2020;14(1):32-45.
17. Kakurai M, Harada K, Maeda T, Hiruma J, Kano R, Demitsu T. Case of tinea corporis due to terbinafine-resistant Trichophyton interdigitale. J Dermatol. 2020;47(4):e104-e5.
18. Khurana A, Sardana K, Chowdhary A. Antifungal resistance in dermatophytes: Recent trends and therapeutic implications. Fungal Genet Biol. 2019; 132:103255.
19. Singh S, Shukla P. End of the road for terbinafine? Results of a pragmatic prospective cohort study of 500 patients. Indian J Dermatol Venereol Leprol. 2018;84:554.
20. Majid I, Sheikh G, Kanth F, Hakak R. Relapse after Oral Terbinafine Therapy in Dermatophytosis: A Clinical and Mycological Study. Indian J Dermatol. 2016;61(5):529-33.
21. Singh S, Shukla P. End of the road for terbinafine? Results of a pragmatic prospective cohort study of 500 patients. Indian J Dermatol Venereol Leprol. 2018;84.
22. Bhatia A, Kanish B, Badyal DK, Kate P, Choudhary S. Efficacy of oral terbinafine versus itraconazole in treatment of dermatophytic infection of skin – A prospective, randomized comparative study. Indian J Pharmacol. 2019;51(2):116-9.
23. Babu PR, Pravin AJS, Deshmukh G, Dhoot D, Samant A, Kotak B. Efficacy and Safety of Terbinafine 500 mg Once Daily in Patients with Dermatophytosis. Indian J Dermatol. 2017;62(4):395-9.
24. El-Gohary M, van Zuuren EJ, Fedorowicz Z, Burgess H, Doney L, Stuart B, et al. Topical antifungal treatments for tinea cruris and tinea corporis. Cochrane Database Syst Rev. 2014(8).
25. Sultana T, Saha S, Hossain M, Ajmeri S, Sarker M, Sultana M, et al. Current Trends of Using Systemic Antifungal Drugs and their Comparative Efficacy in Tinea Corporis and Tinea Cruris in Outpatient Department of Dermatology in a Tertiary Level Hospital. Mymensingh Med J. 2018;27(1):52-6.
26. Goldstein AO, Goldstein BG. Dermatophyte (tinea) infections. Walthman, MA: UpToDate. 2017.