Journal of Mycology Research. Vol 2, No 2, September 2015, Page 105 -110

Comparison between Fluconazole and Terbinafine in the treatment of *Tinea corporis* and *Tinea cruris*

Mohammad Javad Yazdanpanah[1], Ali Akbar Shamsian[2*], Masoud Shafiee[3], Mohammad Reza Hedayati-Moghadam[4], Kiarash Ghazvini[5] and Elham Moghaddas[2]

[1]Cutaneous Leishmaniasis Research Center, Department of Dermatology, School of Medicine,Mashhad University of Medical Sciences, Mashhad, Iran.
[2]Departments of Parasitology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
[3] General Physician, Health Center, Mashhad University of Medical Sciences, Mashhad, Iran.
[4]Research Center for HIV/AIDS, HTLV and Viral Hepatitis, Iranian Academic Center for Education, Culture and Research (ACECR), Mashhad, IR Iran.
[5]Associated Professor of Microbiology, Antimicrobial Resistance Research Center, Department of Microbiology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

*** Corresponding Author: Email: shamsianaa@mums.ac.ir, Telefax: +98 51 38002401-3**

(Received: 25 August 2015, Accepted: 30 September 2015)

Abstract:

Objectives: This study aimed to compare the therapeutic efficacy of Terbinafine and Fluconazole in terms of mycological cure in the treatment of *Tinea corporis* and *Tinea cruris*. Method: In this clinical trial, 30 patients with *T. corporis* and *T .cruris* were selected. Patients were divided into two groups by random selection. The first group was treated with Fluconazole 150 mg weekly for four weeks and the second group was administered Terbinafine 250 mg daily for two weeks. The participants were followed up till the end of the treatment and one month after treatment. Results: At the end of the treatment, 64.3% of the subjects in Fluconazole group developed clinical and laboratory responses; while the second group developed 75% clinical and 81.3% laboratory cure. One month later, 64.3% in the Fluconazole group were cured, while in the other group, 87.5% were cured. No patient had any side effect. Conclusion: Although, no significant difference was observed between these two groups of patients in clinical and laboratory aspect, as a result of lower price and easier consumption, it is suggested that Fluconazole is more suitable for treatment of *Tinea* infections.

Keywords: *fluconazole*, terbinafine, Tinea corporis, Tinea cruris.

Introduction

Dermatophytes can cause different manifestations in humans and the majors ones are *Tinea corporis* and *Tinea cruris*. These can be seen in the skin of the trunk, groin and genital area (Burns et al., 2004; Wolff et al., 2008). They have the tendency of making skin keratin (Burns et al., 2004) to use them as nitrogen source. The disease can manifest as asymptomatic to severe inflammatory reaction in different cases based on the germ virulence and patient's immune response (Habif et al., 2005).

In limited and solitary lesions, topical treatment is enough but in diffuse and inflammatory lesions, administration of oral antifungal therapy, such as Fluconazole, Terbinafine and Griseofulvin is suggested (Habif et al., 2005; Gupta et al., 2008). In such patients, skin infections are more difficult to treat because the disease is often more extensive and severe, and topical treatment is not as efficacious as oral antifungal therapy. Further, in the immunocompromised patient, oral treatment was proposed (Millikan et al., 2001).

The efficacy and side effects of oral antifungal medications are widely studies and their usage is well known (Faergemann et al., 1997) but to the best knowledge of the authors, there is no comparison of the two routinely used drugs (Terbinafine and Fluconazole) in a randomized double blind clinical trial which facilitated this study.

Material and Methods

From April 2010 to September 2012, 30 cases of *T. corporis* and *T. cruris*, referred to Dermatology Clinic of *Ghaem* University Hospital, were enrolled in the present study. Diagnosis was based on both clinical and laboratory evidence of disease including smear and culture. Patients were excluded if they had any of these factors which include systemic diseases, assumption of any medication, systemic or topical, allergy to the antifungal drugs, pregnancy and breast feeding and poor compliance for follow up.

Among 38 patients, 8 patients were excluded and 30 patients were enrolled in this study. The study was approved by the Ethics Committee of Mashhad University of Medical Sciences. All the patients signed an informed consent.

At the first visit, demographic data and clinical feature of disease were recorded. Then, smear and culture were obtained from the active peripheral lesions at the laboratory by an expert. Obtained specimens were prepared with KOH for direct light microscopic examination and the specimen were cultured on Sabouraud dextrose agar for at least 72 h.

Thereafter, patients were divided into 2 groups in a randomized design and treatment was started with the second physician. In the first group (14 patients), 150 mg Fluconazole was prescribed orally every day for 4 weeks and in the second group (16 patients), 250 mg Terbinafine was administered daily for 2 weeks. Clinical examination, smear and culture were repeated at the end of treatment and 4 weeks after treatment.

It should be noted that, all the clinical examinations were performed by the same physician who was unaware of the patient's grouping, exactly like the personnel of the laboratory. Similarly, the drugs were prescribed and given out by another physician who was uninformed about the clinical and laboratory results.

Statistical analysis

SPSS Windows version 11.5 (SPSS, Inc, Chicago, IL) was used for statistical analysis. Student t-test and Chi square test were used to compare differences in different variables. Differences were considered significant at a P value of 0.05 or less.

Results

Among 30 patients with *T. corporis* and *T. cruris*, 14 (46.7%) were treated with Fluconazole and 16 (53.3%) were treated with Terbinafine. Six (20%) patients were female, 3 in each group. The mean age of patients was 26.1±7 years with the range of

18 to 57 years. The average age of patients was 25.8±8.2 and 26.3±4.3 years, in the Terbinafine and Fluconazole groups, respectively. It should be noted that, 20 (66.7%) cases had *T. cruris* alone while 8 (26.7%) cases had *T. corporis* alone. In this study, only 2 (6.6%) patients had lesions both on the trunk and groin areas.

At the end of the treatment, 9 (33/3%) patients showed no response to treatment clinically. Among them, 5(35/7%) patients were treated with Fluconazole and 4(25%) were treated with Terbinafine. In other words, in the first group that received Fluconazole, 9(64.3 %) were cured completely and in the other group, 12(75%) were cured completely and had no clinical sign and symptom after treatment (P = 0.198).

Based on laboratory results, in the first group, 5(35.7%) had positive smear and culture and 9(64/3%) had negative results which is similar to the clinical results. In the second group, that received Terbinafine, there was a patient with clinical improvement and positive laboratory report and another patient with negative reports and clinical signs. There was no significant difference between the two groups (P= 0.41) (Tables1 and2).

Table1. Drug effects on clinical symptoms at the end of treatment.

No respond to treatment	Respond to treatment	Drug
5(35/7%)	9(64/3%)	Fluconazole
4(25%)	12(75%)	Terbinafine

Table 2.Drug effects on laboratory results at the end of treatment.

No respond to treatment	Respond to treatment	Drug
5(35/7%)	9(64/3%)	Fluconazole
3(18/8%)	13(81/3%)	Terbinafine

One month after treatment, 23(76/6%) patients had no clinical sign and symptom. In the first group, that was treated with Fluconazole, 9 (64.3%) patients responded and in the other group, 14(75%) responded (P= 0.505). The laboratory results were exactly the same after one month (Tables 3 and4). It should be noted that, all the patients who had no clinical or laboratory response to treatment just after treatment were considered as “no response to treatment” and here the results are shown in summation with the results one month after the treatment.

There was no significant side effect in any of the patients during and after the treatment.

Tabel 3.Drug effects on clinical symptoms one month after treatment.

No respond to treatment	Respond to treatment	Drug
5(35/7%)	9(64/3%)	Fluconazole
2(12.5%)	14(87/5%)	Terbinafine

Tabel 4.Drug effects on laboratory results one month after treatment.

No respond to treatment	Respond to treatment	Drug
5(35/7%)	9(64/3%)	Fluconazole
2(12.5%)	14(87/5%)	Terbinafine

Discussion

Tineacorporis/cruris is one of the most common forms of the disease and precise diagnosis and treatment can play an important role in prevention of contaminations. In the present study, most of the patients were male; this finding is similar to the results of other researchers in Iran (Rezvani et al., 2010; Naseri et al., 2013; Sepahvand et al., 2009). As shown in almost all thestudiesin Iran, the prevalence of *T. cruris* was significantly higher than that of *T. corporis* (Bassiri et al., 2009; Mahmoudabadi et al., 2005; Falahati et al., 2003). Topical treatment in *Tinea* infections is limited because of the lengthy duration of treatment, poor patient compliance and high relapse rates at specific body sites (Friedlander et al., 1999). Oral therapy is often chosen because of its shorter duration and the potential for greater patient compliance.

According to the sults of this study, after treatment of the patients in the two groups, there was no significant difference between the groups with reference to clinical response to treatment which consist of 64.3% for the Fluconazole group and 87.5% for the Terbinafine group. Based on laboratory results also, there was no significant difference. As noted before, to the best knowledge of the authors, there was no comparison of these two drugs in the treatment of *T. corporis* and *T. cruris*, so, the success rate of each drug was discussed separately. Considering safety, lower cost and also better efficacy of Terbinafine, this drug is more favorable for the treatment of *Tinea* infections in comparison with Fluconazole (Faergemann et al., 1997; Kumar et al., 2013). Our study also confirmed this concept but further controlled studies to clear other aspects are warranted. Short course and pulse dosing are particularly exciting options that may decrease cost and lower the risk of adverse side effects.

There was no significant difference between the two groups according to both clinical and laboratory responses one month after the treatment. And no side effect was reported.

It should be noted that with greater sample size, more reliable results could have

been achieved but unbiased follow up and photography of lesions was one of the important strengths in this study.

Based on this study and according to similar published researches, administration of both Terbinafine and Fluconazole in the treatment of *T. corporis* and *T. cruris* is effective and have no significant side effects, but it should be noted that distinct follow up and always taking sample of the lesion to the patients in each check point in the course of treatment had an important role in this clinical finding. In another study, Griseofulvin was studied as a choice drug for *Tinea* infection in comparison with Terbinafine and Fluconazole and Terbinafine and was proven to be effective (Grover et al., 2012; Gupta et al., 2001).

T. capitis and T.cruris have become an increasing public health concern in the last decade in Iran but no randomized double blind controlled studies using these drugs have been published. As shown in this study, Terbinafine appeared to have a better effect on this disease; however, these effects were not significant and both drugs were effective in controlling *T. corporis* and *T. cruris.*

Acknowledgment

The authors would like to thank Dr. Alireza Nejadhossein, Dr Sorrozaman Famili, Mr Mohsen Najari and Mr Ali Akbar Ghadamgahi for their cooperation in this research. This article was extracted from the thesis prepared by Dr. Masoud Shafiee. The research council of the Mashhad University of Medical Sciences, Mashhad, Iran is appreciated for financially supporting this study with grant number 4614.

Financial Disclosure

There is no financial disclosure.

Funding/Support

There is no funding support.

References

1. Ansar, A., Farshchian, M., Nazeri, H., Ghiasian, S. A., 2011. Clinico-epidemiological and mycological aspects of *Tinea* incognito in Iran: A 16-year study. Med Mycol J, 52(1):25-32.
2. Bassiri, S., Khaksari, A. A., 2009. Epidemiological survey of dermatophytosis in Tehran, Iran, from 2000 to 2005. Indian J DermatolVenereolLeprol, 75(2): 142-7.
3. Burns, T., Breathnach, S., Griffiths, C., Cox, N., 2004. Rook's textbook of dermatology. Blackwell publishing, Massachusetts.
4. Falahati, M., Akhlaghi, L., Lari, A. R., Alaghehbandan, R., 2003. Epidemiology Of dermatophytoses in an area south of Tehran, Iran. Mycopathologia, 156(4):279–87.
5. Friedlander, S.F., 1999. The evolving role of Itraconazole, fluconazole and terbinafine in the treatment of *Tinea capitis*. Pediatr Infect Dis J, 18 (2):205-10.
6. Habif, T. P., 2005. Clinical dermatology, California, Mosby.
7. Faergemann, J., Mörk, N. J., Haglund, A., Odegård, T. A., 1997. Multicentre (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, 136(4): 575-7.
8. Gupta, A. K., Cooper, E. A., 2008. Update in antifungal therapy of dermatophytosis. Mycopathologia, 166(5-6): 353-67.
9. Millikan, L.E., 2001. Role of oral antifungal agents for the treatment of superficial fungal infections in immunocompromised patients. Cutis, 68(1):6-14.

10. Kumar, A., Budania, N., Sharma, P., Singh, M., 2013. A comparative study of mycological efficacy of terbinafine and fluconazole in patients of *Tinea corporis*. IJBR, 4(11): 7-10.

11. Grover, C., Arora, P., Manchanda, V., 2012. Comparative evaluation of griseofulvin, terbinafine and fluconazole in the treatment of *Tinea capitis*. Int J Dermatol, 51(4):455-8.

12. Rezvani, S. M., Sefidgar, A. A., Hasanjani-Roushan, M., 2010. Clinical patterns and etiology of dermatophytosis in 200 cases in Babol, North of Iran. Casp J Intern Med, 1: 23-26.

13. Naseri, A., Fata, A., Najafzadeh, M. J., Shokri,H., Sepahvand, A., Abdi, J., Shirkani, Y., Fallahi, S., 2013. Surveillance of Dermatophytosis in Northeast of Iran (Mashhad) and Review of Published Studies. Mycopathologi, 176(3-4): 247-253.

14. Sepahvand, A., Abdi, J., Shirkhani, Y., Fallahi, S. h., Tarrahi, M., Soleimannejad, S., 2009. Dermatophytosis in Western Part of Iran, khorramabad. Asian J BiolSci,2 (3): 58-65.

15. Mahmoudabadi, A. Z., 2005. A study of dermatophytosis in South West of Iran (Ahwaz). Mycopathologia, 160(1):21–4.

16. Gupta, A. K., Adam, P., Dlova, N., Lynde, C. W., Hofstader, S., Morar, N., Aboobaker, J., Summerbell, R. C., 2001. Therapeutic options for the treatment of *Tinea capitis* caused by Trichophyton species: griseofulvin versus the new oral antifungal agents, terbinafine, itraconazole, and fluconazole. PediatrDermatol, 18(5):433-8.

17. Wolff, K., Goldsmith, L. A., Katz, S. I., Gilchrest, B. A., Paller, A. S., Leffell, D. J., 2008. Fitzpatrick's dermatology in general medicine. California,Mcgrawhill.