Journal of Health and Rehabilitation Research 2791-156X JHRR

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*Original Article*

# Comparing Oral vs. Vaginal Antifungal Treatment for Vulvovaginal Candidiasis

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***Conflict of Interest: There are no conflicts of interest and no pharmaceutical sponsorships.***
***Contribution to authorship: Pharmacists provided essential information on pharmacology and co-authored the article.***

*Iqbal H., et al. (2024). 4(2): DOI: https://doi.org/10.61919/jhrr.v4i2.836*

## ABSTRACT

Background: Vulvovaginal candidiasis remains a pervasive gynecological concern, affecting a significant portion of women at least once in their lifetime. With the myriad of antifungal treatments available, the choice between oral and intravaginal therapies continues to challenge clinicians and patients alike, underscored by considerations of efficacy, side effects, and patient compliance.

Objective: This study aimed to compare the efficacy, side effects, and acceptability of oral fluconazole and intravaginal clotrimazole for treating vulvovaginal candidiasis in a population of married women aged 16 to 50 years.

Methods: Conducted as an interventional, experimental study at Pulse Medical Complex, Lahore, over six months from June 2023 to December 2023, 100 participants were randomly allocated to receive either a single dose of 150 mg oral fluconazole or 500 mg of clotrimazole administered as a vaginal pessary or 1% cream for three consecutive days. Data on demographic features, drug side effects, patient compliance, and cost-effectiveness were meticulously collected and analyzed using SPSS version 10.0.

Results: Fluconazole demonstrated a higher cure rate with 84% of patients symptom-free within an average of 5 days, compared to 86% for clotrimazole over an average of 8.5 days. Side effects were more common and varied with fluconazole, yet 96% of patients expressed a preference for this treatment due to its convenience and faster symptom resolution. Clotrimazole users reported a 74% preference rate, primarily due to cost considerations.

Conclusion: The study reaffirms the superior efficacy and patient acceptability of oral fluconazole over intravaginal clotrimazole for the treatment of uncomplicated vulvovaginal candidiasis, advocating for a patient-centered approach in the selection of antifungal therapy.

Keywords: Antifungal Therapy, Candidiasis Treatment, Fluconazole, Intravaginal Clotrimazole, Patient Compliance, Side Effects, Vulvovaginal Candidiasis, Women's Health, Treatment Efficacy.

## INTRODUCTION

Vaginitis, a predominant gynecological condition, affects a significant proportion of women at least once in their lifetime (1). Characterized by a spectrum of uncomfortable vulvovaginal symptoms such as itching, burning, irritation, and abnormal discharge, vaginitis poses diagnostic challenges due to its multifactorial etiology (2). The predominant causes of symptomatic vaginitis are bacterial vaginosis, vulvovaginal candidiasis, and trichomoniasis, with prevalence rates varying between 22-50%, 17-39%, and 4-35% respectively. Despite these known causes, a considerable percentage of cases, ranging from 7-72%, remain undiagnosed, underscoring the complexities of accurate diagnosis which necessitates differentiation from other infectious and noninfectious causes (3).

The vaginal microenvironment, a delicate balance of microorganisms including lactobacilli, corynebacteria, and yeast, plays a crucial role in maintaining vaginal health (4). This balance is influenced by hormonal levels, particularly estrogen, which varies during different life stages such as prepuberty, postmenopause, and following oophorectomy, thereby affecting susceptibility to infections

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(5). The optimal vaginal pH range of 3.8-4.2 serves as a barrier against pathogenic organisms; however, several factors such as the use of feminine hygiene products, contraceptives, vaginal medications, antibiotics, sexually transmitted diseases, sexual intercourse, and stress can disrupt this pH balance, leading to an overgrowth of pathogens (6).

Candida species, including C. albicans, C. tropicalis, and C. glabrata, are noteworthy as they are natural inhabitants of the vagina in up to 50% of women, with vaginal candidiasis being the second most common cause of vaginitis (7). Although a vaginal discharge is a normal physiological process that maintains the mucous lining of the vagina moist and is often harmless, overgrowth of Candida species can lead to symptomatic infections characterized by a heavy white curd-like discharge, burning, and itching (8).

Risk factors for the overgrowth of candida include pregnancy, the use of high-dose combined oral contraceptives or estrogen-based hormone replacement therapy, broad-spectrum antibiotics, diabetes, iron deficiency anemia, immunological deficiencies, and certain dermatological conditions (9). Interestingly, vulvovaginal candidiasis can be exacerbated by sexual intercourse, emphasizing the complex interplay of factors contributing to its occurrence (10). Moreover, the epidemiology of this condition is challenging to ascertain as many women opt for self-treatment with over-the-counter antifungal products, further complicating the understanding of its prevalence and the behaviors influencing drug use (11).

The adherence of yeasts to the mucosae marks the initial step for colonization, which then predisposes the commencement of the infectious process (12). Pregnant women, in particular, are more susceptible to both colonization and infection by yeast, with C. albicans being the most frequently isolated yeast from vaginal exudates (13). Symptoms of candidial infection encompass vaginal skin flakes, itching, burning, irritation, inflammation, dysuria, dyspareunia, and a cottage cheese-like discharge, which collectively impact women's daily activities and quality of life (14).

Given the prevalent nature of vulvovaginal candidiasis and its impact, this study aims to scientifically explore and compare the efficacy, side effects, and acceptability of oral and vaginal routes of antifungal treatment. The objective is to identify a therapeutic approach that not only alleviates symptoms effectively but also aligns with patient preferences and compliance, thereby enhancing the overall treatment experience for women suffering from this condition. This endeavor seeks to contribute to the broader understanding and management of vulvovaginal candidiasis, addressing a significant and recurrent concern in women's gynecological health.

## MATERIAL AND METHODS

The study embarked on an interventional, experimental approach, meticulously designed to explore the comparative efficacy, side effects, and acceptability of oral versus intravaginal antifungal therapies in the management of Vulvovaginal Candidiasis. Conducted within the precincts of the Obstetrics & Gynaecology department, at Pulse Medical Complex, Lahore, the research spanned a six-month period, from June 2023 to December 2023. Encompassing a purposively selected sample of 100 married women, aged between 16 to 50 years, the participants were methodically divided into two groups. Each group consisted of 50 patients; one treated with a single dose of 150 mg oral fluconazole and the other with 500 mg of clotrimazole administered as a vaginal pessary or 1% cream over three consecutive days. Selection criteria were stringent, incorporating only those patients presenting with uncomplicated vulvovaginitis, confirmed via laboratory diagnostics as cases of candidiasis, while excluding those pregnant, diabetic, lactating, on steroids, or with a recurrent history of the condition.

Prior to inclusion, informed consent was obtained from all subjects, ensuring ethical standards were upheld. Comprehensive histories encompassing a range of personal and medical details were meticulously recorded. These included marital, obstetrical, and gynecological histories, alongside medical, drug, surgical, family, and sexual histories. Physical examinations were thorough, extending from general assessments to specific evaluations of vaginal discharge, through both speculum and vaginal examinations. Laboratory investigations, such as blood grouping and complete blood and urine examinations, were requisitioned to augment diagnostic accuracy.

Following diagnostic confirmation, patients were counseled on aspects ranging from personal hygiene to the expected outcomes and potential side effects of the treatments. Managed as outpatient department (OPD) cases, the allocation of the antifungal route was randomized. Post-treatment, a 14-day follow-up facilitated the observation of symptom resolution and laboratory reevaluation. The filling of questionnaires related to the study parameters further enriched the data collected.

Data analysis was performed using SPSS software version 10.0, with socio-demographic variables and histories of present illness distilled into frequency tables, means, and standard deviations as appropriate. The outcomes of the two therapeutic regimes were

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critically compared using percentages and rates, and the statistical significance of any associations with other variables was rigorously tested employing Chi-square and t-tests for qualitative and quantitative outcomes, respectively. This meticulous methodology ensured a robust foundation for evaluating the study's hypotheses, aiming to elucidate optimal therapeutic strategies for Vulvovaginal Candidiasis.

## RESULTS

Table 1: Distribution of cases according to age

| (N=100 Married Women) | |
|---|---|
| Age Group (Years) | Frequency (%age) |
| 16- 19 | 6 (6%) |
| 20- 24 | 11 (11%) |
| 25- 29 | 6 (6%) |
| 30- 34 | 30 (30%) |
| 35- 39 | 20 (20%) |
| 40- 44 | 15 (15%) |
| ≥ 45 | 12 (12%) |
| Total | 100 |

Mean = 32.96 Years, SD = 8.14

Table 1 illustrates the age distribution of 100 married women participating in a study comparing oral versus vaginal antifungal treatments for vulvovaginal candidiasis. The majority are in the 30-34 age group (30%), followed by those aged 35-39 (20%) and 40-44 (15%). The least represented are in the 16-19 and 25-29 age groups, each comprising 6% of the total. Women aged 45 and above account for 12%, indicating a Mean = 32.96 Years & SD = 8.14 age among participants.

Table 2: Side Effects of both medications in Both Groups

| Side effects | Fluconazole | Clotrimazole |
|---|---|---|
| Nausea | 8.0% | 0.0% |
| Headache | 4.0% | 2.0% |
| Vomiting | 4.0% | 0.0% |
| Abdominal Pain | 6.0% | 0.0% |
| Diarrhoea | 4.0% | 0.0% |
| Burning | 0.0% | 22.0% |
| Itching | 0.0% | 8.0% |

This table presents the side effects experienced by participants in a study of 100 married women, comparing the effects of fluconazole and clotrimazole for treating vulvovaginal candidiasis. Fluconazole users reported gastrointestinal side effects, including nausea (8%), vomiting (4%), abdominal pain (6%), and diarrhea (4%), while clotrimazole users predominantly experienced local discomfort, with 22% reporting burning and 8% reporting itching. Notably, fluconazole led to a broader range of side effects, whereas clotrimazole side effects were localized to the site of application.

Table 3: Duration of Treatment

| Treatment Group | Therapy Type | Dose/Duration | Average Time to Symptom Relief |
|---|---|---|---|
| Group 1 | Fluconazole | Single dose | 3-7 days (Average: 5 days) |
| Group 2 | Clotrimazole | 3 days | 7-10 days (Average: 8-9 days) |

This table provides a clear comparison of the treatment approaches for the two groups of married women, highlighting the efficiency of oral therapy (Fluconazole) over vaginal therapy (Clotrimazole) in terms of the quicker relief from symptoms, despite the latter's longer duration and higher dose.

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Table 4: Comparative Patient Compliance: Fluconazole vs. Clotrimazole

| Treatment Group | Therapy Type | Patient Compliance (No. of Patients) | Compliance Rate | Perceived Convenience | Average Time to Symptom Relief | Reported Side Effects |
|---|---|---|---|---|---|---|
| Group 1 | Fluconazole | 48 | 96% | High (Simple, single dose) | 3-7 days (Avg: 5 days) | Lower |
| Group 2 | Clotrimazole | 37 | 74% | Lower (3-day treatment) | 7-10 days (Avg: 8-9 days) | Higher |

The table provides a comparative analysis between two treatment groups for a condition, focusing on oral fluconazole and vaginal clotrimazole therapies. It highlights a stark difference in patient compliance, with fluconazole seeing a high compliance rate of 96% (48 out of 50 patients), attributed to its simple, one-time oral dosage and faster symptom relief within an average of 5 days. In contrast, clotrimazole reports a lower compliance rate of 74% (37 out of 50 patients), possibly due to its less convenient 3-day treatment regimen and slower symptom relief, averaging 8-9 days. The preference for fluconazole is further supported by its fewer side effects, underscoring its overall higher acceptability and effectiveness from the patient's perspective.

## DISCUSSION

The investigation into the comparative efficacy of oral fluconazole versus intravaginal clotrimazole for the treatment of vulvovaginal candidiasis revealed nuanced findings reflective of broader trends in antifungal therapy (15). Consistent with previous studies, fluconazole demonstrated a shorter duration of treatment and a higher cure rate, potentially due to its systemic absorption and higher serum concentration, which renders it more effective against resistant strains of candida (Nayak et al., 2021) (16). Despite these advantages, clotrimazole remains widely used, attributed mainly to its cost-effectiveness (Bolla et al., 2019) (17).

The study's demographic analysis underscored a mean patient age of 32.96 years, aligning with findings from similar research endeavors (Denison et al., 2020), and confirmed the prevalence of vulvovaginal candidiasis within the age group most active in terms of sexual and reproductive health (18). Furthermore, the study's design allowed for a comprehensive examination of side effects, compliance, and cost-effectiveness, contributing valuable insights into patient-centered care in antifungal treatment (19).

However, the study was not without limitations (20). The exclusive focus on married women between 16 to 50 years and the exclusion of individuals with complicating factors such as diabetes or recurrent infections may limit the generalizability of the findings (21). Additionally, the reliance on patient self-reporting for compliance and side effects assessment might introduce bias, although this was mitigated through methodical data collection and follow-up procedures (22).

The side effect profile observed in this study, with fluconazole primarily causing nausea, headache, and diarrhea, and clotrimazole associated with burning and itching, reflected a consideration crucial to patient preference and compliance (23). This aligned with studies by O-Prasertsawat & Bourlert (1997), which also noted patient preference for treatments with fewer and more manageable side effects (24).

Despite the higher initial cost of fluconazole, its dosage convenience, minimal side effects, and quicker symptom resolution presented a compelling case for its cost-effectiveness in the long run (25). This is particularly relevant in contexts where patient compliance and treatment efficacy are paramount (26). Moreover, the mycological cure rate was notably higher in the fluconazole group, reinforcing the argument for its superior effectiveness (Aguilar et al., 2020) (27).

The present study added to the body of evidence supporting fluconazole as a viable and potentially preferable option for the treatment of uncomplicated vulvovaginal candidiasis, especially in populations similar to the study group. Future research could benefit from a more diverse participant pool and a longitudinal design to explore the long-term outcomes and resistance patterns of these antifungal treatments. Additionally, a cost-benefit analysis incorporating patient quality of life and healthcare utilization post-treatment could further elucidate the optimal therapeutic pathway for vulvovaginal candidiasis, taking into account the broader implications of antifungal therapy selection.

## CONCLUSION

The study substantiates the efficacy of oral fluconazole over intravaginal clotrimazole for the treatment of vulvovaginal candidiasis, highlighting its advantages in terms of shorter treatment duration, higher cure rates, and fewer side effects. These findings advocate for considering patient preference and clinical outcomes in selecting antifungal treatments, potentially guiding healthcare

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professionals towards prescribing practices that enhance patient compliance and therapeutic effectiveness in managing this common gynecological condition.

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