ORIGINAL RESEARCH

Assessing the Efficacy of Ketoconazole Tablet versus Topical Ketoconazole 2% in Orabase for Treating Candida-Infected Denture Stomatitis

Dr.Varun Singla

Professor, Department of Dentistry, Al - Falah School of Medical Science and Research, Dhauj, Faridabad, Haryana, India

Corresponding author
Dr.Varun Singla
Professor, Department of Dentistry, Al - Falah School of Medical Science and Research, Dhauj, Faridabad, Haryana, India
Email: varunsingla2222@gmail.com

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ABSTRACT
Aim: Evaluating the Effectiveness of Topical Ketoconazole 2% in Orabase versus Ketoconazole Tablet in the Treatment of Candida-Infected Denture Stomatitis. **Introduction:** Denture stomatitis is a common problem among denture wearers, and treatment often involves the use of antimycotic drugs such as ketoconazole tablet. However, systemic administration of ketoconazole tablet can lead to adverse effects and poor compliance, potentially resulting in treatment failure. This study aims to compare the efficacy of topical ketoconazole 2% in orabase with ketoconazole tablet for treating denture stomatitis. **Methods and Materials:** Sixty patients with denture stomatitis (confirmed by positive culture) were divided into two groups. The first group received oral ketoconazole tablet (200 mg per day) for 14 days, while the second group applied topical ketoconazole 2% in orabase twice daily on the mucosal surface of the denture. Candida cultures were obtained from the palatal mucosa before treatment and on days 7 and 14 of therapy. The average colony counts were calculated for each time point. Data analysis was performed using one-way ANOVA and paired t-test ($p=0.05$). **Results:** The mean colony counts before treatment were 500 and 510 in the tablet and topical application groups, respectively. After treatment, the mean colony counts on the seventh day were 120 and 180 for the tablet and topical application groups, and on the 14th day, they were 130 and 90, respectively. There was no significant difference in colony counts between the two groups after treatment. **Conclusion:** Topical ketoconazole 2% in orabase can be an effective treatment option for managing denture stomatitis. This topical medication offers the advantage of fewer side effects compared to systemic administration of ketoconazole tablet, which is associated with potential complications.

Keywords: ketoconazole, orabase, candida, denture stomatitis, topical treatment

INTRODUCTION

A typical symptom of chronic oral candidiasis, denture stomatitis, is a widespread infection of the maxillary denture-bearing areas.(1) Denture stomatitis is more common in some populations than others, with prevalence rates ranging from 10% to 65%.2-5 Fungal growth is present in at least 70% of people who have clinical denture stomatitis symptoms, and this condition is most likely caused by yeast colonization.(2,6)Candida samples invade tissue that has been subjected to prolonged damage and is prone to microbial invasion. Among the systemic predisposing variables include decreased salivary flow rate, medication, various endocrinopathies, dietary and metabolic factors,(7) abnormalities in the host defense mechanism (8), Local predisposing variables point to poor stability, retention, and hygiene of dentures. The mucosa underneath the denture develops redness, swelling, smoothness or granularity, and occasionally hurts. It regularly happens to have several pinpoint foci hyperemia, which usually involves the palate. It's not unusual to experience intense burning.(9) Mucosal redness may be well delineated and limited to tissue in contact with the denture. Infectious fungi, primarily Candida albicans, are frequently the cause of denture stomatitis.Candida infection was once thought to be a significant contributor to the pathogenesis of denture

stomatitis.(10,11) Dentures offer a special microenvironment that may encourage Candida albicans growth even in the absence of additional risk factors. As the pathogenic form of Candida albicans builds up, hyphae, a severe immunologic response, and denture stomatitis are observed.(12) Careful denture cleaning and the elimination or reduction of other systemic and local predisposing factors, such as poorly fitted dentures, inadequate dietary intake, or antibiotics and medications that cause hyposalivation, should be the first steps in treatment.(9)

If the symptoms do not go away, antimycotic medications should be used to control the infection.(9) Long-term usage of many antimycotic medications may be necessary for elderly patients with predisposing conditions including xerostomia and immunodeficiency, which can result in the development of several side effects that frequently result in poor compliance and treatment failure.(1)Several studies have tested and compared systemic and topically applied antifungal medications for the treatment of denture stomatitis.(9,13–17)

In order to cure denture stomatitis caused by Candida, the effectiveness of a topically applied miconazole denture lacquer was compared to that of a placebo denture lacquer. The findings show that a single use of a miconazole denture lacquer significantly lowers the amount of Candida yeasts for a significant amount of time.(9)

In a another trial, commercially available miconazole 2% gel that was administered four times per day for two weeks was statistically superior to miconazole lacquer that was only applied once to the surface of the denture tissue.(13) In addition, applying Miconazole 2% Gel for two weeks works better than Zataria multiflora 0.1 Gel at reducing the colony count on the denture surface.(14) There was no statistically significant difference between the two groups' Candida albicans counts in saliva, lesions, and dentures following therapy when fluconazole capsules and hexetidine mouthrinses were compared for the treatment of denture stomatitis.(15) Finally, it has been demonstrated that the oral lesions can be greatly reduced when fenticonazole, nystatin, and ketoconazole 2% in orabase are applied topically to treat oral chronic candidosis.(16)

In order to treat denture stomatitis caused by Candida, this study compared the effectiveness of topically applied ketoconazole 2% in orabase with a once-daily administration of a 200 mg ketoconazole tablet.

METHODS AND MATERIALS

Department of Prosthodontics was used to recruit complete denture wearers aged 56 to 90. All of the participants had moderate to severe erythematous palatal mucosa and had not used any antibiotics, antimycotics, or hyposalivating medications in the month prior to the study. Each person had sterile palatal mucosa swabs collected from them, which were then cultivated on a dextrose sabouraud agar + chloramphenicol plate and incubated for 48 hours at 37°C. Less than 100 candida colonies per person were disqualified from the study. Finally, two groups of 30 patients were chosen for a clinical trial that was randomized. The pharmaceutical research lab created a topical ketoconazole 2% in orabase ointment for the other group, while the first group received one daily dose of a 200 mg ketoconazole tablet.

The palatal mucosa was to be covered with a thin layer of topical ointment twice daily, once after breakfast and once before bed, using a tiny brush. Individuals who were 7 and 14 days post-treatment underwent the same culturing process described above for inclusion criteria. The Committee of Ethics and Research gave its approval to the project. The data were analyzed using paired t-tests and one-way analysis of variance (p=0.05).

RESULTS

At inclusion, the pill group had an average of 500 colonies, while the ointment group had an average of 510 colonies (Table 1). Between the two patient groups, there was no statistically significant difference in the results of the culture. The mean number of colonies in this group was 180 seven days following administration of the ointment, compared to 120 in the tablet group. The mean number of colonies in the ointment group was 90; in the tablet group, it was 130 fourteen days after application. In the ointment group, the differences between days 0 and 7 (p=0.01), 0 and 14 (p=0.01), and 7 and 14 (p=0.02) were all statistically significant. In the tablet group, however, the differences between days 0 and 7 (p=0.01) and 0 and 14 (p=0.01) were both statistically significant, but days 7 and 14 (p=0.8) did not show any statistically significant differences.

Table 1: Mean number of colonies before and after treatment in two group

Group	Mean number of colonies (Day 0)	Mean number of colonies (Day 7)	Mean number of colonies (Day 14)
Tablet	500	120	130
Std.error of mean	121.11	27.22	23.11
Ointment	510	180	90
Std.error of mean	111.21	34.12	16.13

DISCUSSION

The earlier polyene antifungal medicines nystatin and amphotericin B, as well as a number of topical and systemically given drugs, are now available for the treatment of oral candidiasis.(1) One imidazole derivative that is useful in treating both acute and

chronic candidiasis is the 200 mg once-daily ketoconazole tablet. However, when this medication is used for an extended period of time (as in the treatment of the chronic form of candidiasis), side effects may develop.(1)Gastrointestinal issues, nausea, vomiting, diarrhea, constipation, abdominal pain, a temporary increase in the serum concentration of liver enzymes, hepatitis, gynecomastia, suppression of the adrenal cortex, hypersensitivity reactions, pruritus, rash, headache, dizziness, and sleepiness were some of these side effects. Aside from severe depression, hair loss, thrombocytopenia, paraesthesia, and photophobia, ketoconazole has also been sporadically linked to these side effects.(18) On the other hand, topical ketoconazole was initially authorized in 1990 as a shampoo and as a cream formulation. There are no harmful side effects.(19)The most often reported side effects were stinging, pruritus, and irritation.(18)

On days 0, 7, and 14, the average number of colonies in the pill and ointment groups are shown in Table 1. The mean number of colonies in the two groups reduced significantly (p 0.001) after 14 days of therapy.

Despite the fact that the mean number of colonies decreased more in the ointment group than in the tablet group, the statistical difference between the two groups was not significant (p=0.999). It would have been better to observe the effects of a topical application for a longer period of time, perhaps for five to six weeks.

The low dose (10 mg) of the miconazole mucoadhesive tablet is not inferior to the systemic antifungal treatment with ketoconazole, according to a comparison of the two treatments' efficacy in HIV-positive patients with oropharyngeal candidiasis. However, ketoconazole treatment was associated with a higher incidence of gastrointestinal problems and drug-related adverse events. Additionally, miconazole 50 mg mucoadhesive buccal tablets were well tolerated and may be suggested as an alternative to systemic medications for cancer patients who have oropharyngeal candidiasis.(19)

The presence of numerous predisposing variables, such as immunodeficiency, inadequate dietary intake, and xerostomia, which cannot be eradicated and are known to play a significant role in the etiology, persistence, and recurrence of this infection.

Along with host-related predisposing factors, Candida albicans adherence and enzyme production may also play a role in determining whether a person will contract the disease or continue to be a healthy carrier. However, these patients may require ongoing or recurrent therapy, better denture cleanliness, and improved nutritional status, particularly if underlying predisposing factors cannot be eradicated. In conclusion, topical ketoconazole 2% in orabase ointment has fewer side effects than a ketoconazole tablet when used systemically, and it has been shown to be effective in reducing the number of Candida colonies in cultures taken from the palatal mucosa of elderly patients with denture stomatitis. A therapeutically efficacious antifungal medication with excellent patient compliance would be preferable to more traditional antifungal medicines in such individuals.

CONCLUSION

According to the results of the culture, ketoconazole tablets and ketoconazole 2% in orabase had equivalent efficacy in treating denture stomatitis. Between days 7 and 14, there was a statistically significant difference in the mean number of colonies in the ointment group, whereas between days 7 and 14 there was no statistically significant difference in the mean number of colonies in the pill group. Clinicians may prefer topical ketoconazole over oral ketoconazole because it has fewer side effects.

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