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Original Research Article

TO INVESTIGATE THE CLINICAL PRESENTATION, DIAGNOSIS, AND MANAGEMENT OF ORAL CANDIDIASIS IN IMMUNOCOMPETENT PATIENTS

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Abstract
Background: The aim is to investigate the clinical presentation, diagnosis, and management of oral candidiasis in immunocompetent patients. **Materials and Methods:** A total of 30 patients were selected for this study based on specific inclusion and exclusion criteria. Inclusion criteria consisted of patients aged 18 years or older who were diagnosed with oral candidiasis through clinical examination and microbiological culture. Only immunocompetent patients were included, as confirmed by normal blood counts, negative HIV serology, and no history of immunosuppressive medication use. All selected patients underwent a thorough oral examination conducted by an experienced oral medicine specialist. The clinical diagnosis of oral candidiasis was established based on the presence of characteristic white plaques, erythematous lesions, or pseudomembranous patches on the oral mucosa. These lesions were photographed and meticulously documented to ensure accurate diagnosis and follow-up. **Result:** The clinical presentation of oral candidiasis in the study population was varied, with the most common feature being white plaques, observed in 20 patients (66.67%). Erythematous lesions were present in 15 patients (50%), making it the second most common clinical feature. Pseudomembranous patches were observed in 10 patients (33.33%). The microbiological analysis identified Candida albicans as the predominant species, accounting for 73.33% (22 isolates) of the cases. Candida glabrata was the second most common species, identified in 16.67% (5 isolates) of the patients. Less frequently identified species included Candida tropicalis (6.67%, 2 isolates) and Candida parapsilosis (3.33%, 1 isolate). The treatment response varied among the patients, with 40% (12 patients) receiving topical antifungals, 33.33% (10 patients) treated with systemic antifungals, and 26.67% (8 patients) undergoing combination therapy. **Conclusion:** This study highlights the diverse clinical presentations of oral candidiasis in immunocompetent patients, emphasizing the importance of thorough clinical and microbiological evaluation for accurate diagnosis. The findings demonstrate that while Candida albicans remains the predominant species, other non-albicans species also play a significant role. Treatment outcomes were generally favorable, particularly with combination therapy. The study underscores the need for personalized treatment approaches based on the severity and specific Candida species involved to ensure optimal patient outcomes.

INTRODUCTION

Oral candidiasis, commonly known as oral thrush, is a fungal infection of the oral mucosa primarily caused by the overgrowth of Candida species, particularly Candida albicans. This condition is typically associated with immunocompromised individuals, such as those with HIV/AIDS, cancer patients undergoing chemotherapy, or individuals on prolonged corticosteroid or antibiotic therapy. However, the occurrence of oral candidiasis in immunocompetent individuals is less common and often presents with atypical features, posing challenges in diagnosis and management.[1] Oral candidiasis manifests in various clinical forms, ranging from the more common pseudomembranous type, characterized by white curd-like plaques on the mucosal surfaces, to erythematous and hyperplastic variants. These forms of candidiasis can be distinguished based on their appearance, location, and associated symptoms. While the pseudomembranous type is most frequently observed, particularly in immunocompromised patients, the erythematous form, which presents as

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red, inflamed patches on the mucosa, and the hyperplastic form, characterized by persistent white lesions that cannot be wiped away, are also significant. The variability in clinical presentation underscores the need for clinicians to be vigilant in identifying less common forms of the disease, especially in patients who are not typically considered at high risk for fungal infections.[2,3] In immunocompetent individuals, the occurrence of oral candidiasis may be linked to local factors that disrupt the balance of the oral microbiome or compromise the mucosal barrier. These factors can include poor oral hygiene, the use of dentures, smoking, or a high-sugar diet, all of which can create an environment conducive to Candida overgrowth. Additionally, certain medications, such as inhaled corticosteroids used in the management of asthma or chronic obstructive pulmonary disease (COPD), can predispose individuals to develop oral candidiasis by altering the local immune environment in the mouth.[4] Despite the lower prevalence of oral candidiasis in immunocompetent individuals, when it does occur, it often presents a diagnostic challenge. The symptoms may be subtle or atypical, leading to delays in diagnosis and treatment. For instance, patients may present with burning sensations, altered taste, or discomfort without the obvious presence of white plaques, which can lead clinicians to consider other diagnoses, such as allergic reactions, viral infections, or even malignancies. This atypical presentation can complicate the clinical approach, necessitating a high index of suspicion and the use of confirmatory diagnostic methods, such as microbiological culture or biopsy, to establish a definitive diagnosis.[5,6]

The management of oral candidiasis in immunocompetent patients also requires careful consideration, as the standard treatment protocols may not always be appropriate. Antifungal therapy is the mainstay of treatment, with options including topical agents like nystatin or clotrimazole, as well as systemic antifungals like fluconazole for more severe or refractory cases. However, the choice of treatment must be tailored to the individual patient, taking into account factors such as the extent of the infection, the presence of underlying predisposing conditions, and the potential for drug interactions or side effects. Moreover, in cases where oral candidiasis recurs frequently, it is essential to identify and address any underlying factors that may be contributing to the persistence of the infection, such as poorly controlled diabetes or unrecognized immunosuppressive conditions.[7,8] The emergence of antifungal resistance, particularly among non-albicans species of Candida, presents another layer of complexity in the management of oral candidiasis. In recent years, there has been a growing recognition of the role of species like Candida glabrata, Candida krusei, and Candida tropicalis in oral infections. These species often exhibit reduced susceptibility to commonly used antifungal agents, necessitating the use of alternative therapies or combination treatment

strategies. The rising incidence of antifungal resistance underscores the importance of accurate species identification and susceptibility testing in guiding effective treatment.[9] In addition to clinical and microbiological challenges, the psychological and social impact of oral candidiasis on patients should not be overlooked. The condition can cause significant discomfort, affect oral intake, and lead to embarrassment or social withdrawal due to the visible nature of the lesions and the associated symptoms. This is particularly true for patients who experience recurrent infections or who have difficulty achieving complete resolution of their symptoms. Therefore, a holistic approach to management that addresses both the medical and psychosocial aspects of the condition is crucial.[10] Furthermore, the role of patient education in the prevention and management of oral candidiasis cannot be overstated. Educating patients about the importance of maintaining good oral hygiene, managing risk factors such as smoking or poorly controlled diabetes, and adhering to prescribed treatments is essential in preventing recurrences and ensuring optimal outcomes. In the case of patients using inhaled corticosteroids, proper inhaler technique and the use of mouth rinses after inhalation can significantly reduce the risk of developing oral candidiasis.

MATERIALS AND METHODS

This study was conducted to investigate the clinical presentation, diagnosis, and management of oral candidiasis in immunocompetent patients, with a specific focus on its unusual presentation. The study was designed as a prospective observational study, carried out over a period of 12 months. The study protocol received approval from the Institutional Ethics Committee (IEC), ensuring adherence to ethical guidelines. Informed consent was obtained from all participants before their enrolment in the study, safeguarding their rights and well-being throughout the research process. A total of 30 patients were selected for this study based on specific inclusion and exclusion criteria. Inclusion criteria consisted of patients aged 18 years or older who were diagnosed with oral candidiasis through clinical examination and microbiological culture. Only immunocompetent patients were included, as confirmed by normal blood counts, negative HIV serology, and no history of immunosuppressive medication use. Exclusion criteria included patients with known immunodeficiency disorders such as HIV/AIDS or leukemia, those undergoing immunosuppressive therapy like corticosteroids or chemotherapy, pregnant or lactating women, and patients with uncontrolled diabetes mellitus.

All selected patients underwent a thorough oral examination conducted by an experienced oral medicine specialist. The clinical diagnosis of oral candidiasis was established based on the presence of characteristic white plaques, erythematous lesions, or pseudomembranous patches on the oral mucosa.

These lesions were photographed and meticulously documented to ensure accurate diagnosis and follow-up. For microbiological analysis, swabs were collected from the oral lesions of each patient and cultured on Sabouraud dextrose agar to identify Candida species. The isolates were further characterized using conventional microbiological methods, including germ tube test, chlamydospore formation, and carbohydrate assimilation tests. Additionally, polymerase chain reaction (PCR) was performed on the isolates to confirm the specific species of Candida, ensuring precise identification. Upon confirming the diagnosis, patients were treated with appropriate antifungal agents. The choice of antifungal therapy, whether topical or systemic, was determined based on the severity and extent of the lesions. Treatment response was closely monitored through follow-up visits at 1, 2, and 4 weeks after the initiation of treatment, allowing for adjustments to the treatment plan as necessary. Data collected during the study included demographic information, clinical presentation details, microbiological findings, treatment regimens, and treatment outcomes. Descriptive statistics were employed to summarize the data, and comparisons between groups were made using relevant statistical tests, such as the chi-square test and Fisher's exact test. A p-value of less than 0.05 was considered statistically significant, indicating meaningful differences or associations within the study results.

RESULTS

Demographic Profile [Table 1]
The demographic profile of the study population reveals that the mean age of the participants was 45.76 years with a standard deviation of 12.26 years, indicating a moderate age variation among the patients. The gender distribution shows a predominance of male patients, with 20 males (66.67%) and 10 females (33.33%). This may suggest that oral candidiasis is more common or more likely to be diagnosed in males within the studied population. The average duration of symptoms before seeking medical attention was approximately 3.13 weeks, with a standard deviation of 1.15 weeks, highlighting a relatively short period from symptom onset to clinical intervention. Regarding smoking status, 9 patients (30%) were smokers, while the majority, 21 patients (70%), were non-smokers, suggesting that smoking may not be a significant factor in the development of oral candidiasis in this cohort.

Clinical Presentation of Oral Candidiasis [Table 2]
The clinical presentation of oral candidiasis in the study population was varied, with the most common feature being white plaques, observed in 20 patients (66.67%). Erythematous lesions were present in 15 patients (50%), making it the second most common clinical feature. Pseudomembranous patches were observed in 10 patients (33.33%). These findings indicate that while white plaques are the most typical presentation, a significant proportion of patients also presented with erythematous and pseudomembranous forms of candidiasis, underscoring the importance of recognizing these less common presentations for accurate diagnosis and treatment.

Microbiological Findings [Table 3]
The microbiological analysis identified Candida albicans as the predominant species, accounting for 73.33% (22 isolates) of the cases. Candida glabrata was the second most common species, identified in 16.67% (5 isolates) of the patients. Less frequently identified species included Candida tropicalis (6.67%, 2 isolates) and Candida parapsilosis (3.33%, 1 isolate). The predominance of Candida albicans aligns with its well-documented role as the most common cause of oral candidiasis. However, the presence of non-albicans Candida species in approximately 26.67% of the cases highlights the need for accurate species identification to guide appropriate antifungal therapy, as these species may have different resistance profiles.

Treatment Response [Table 4]
The treatment response varied among the patients, with 40% (12 patients) receiving topical antifungals, 33.33% (10 patients) treated with systemic antifungals, and 26.67% (8 patients) undergoing combination therapy. The distribution of treatment modalities suggests that while topical treatment was the most commonly employed, a significant portion of patients required systemic or combination therapy, possibly indicating more severe or refractory cases of candidiasis.

Treatment Outcome at 4 Weeks [Table 5]
At the 4-week follow-up, 66.67% (20 patients) of the study population experienced complete resolution of their symptoms, indicating a favorable response to the treatment regimens employed. Partial resolution was observed in 26.67% (8 patients), suggesting that while the treatment was effective, it did not fully eliminate the infection in these patients. A small number of patients (6.66%, 2 patients) showed no improvement, highlighting the challenge in managing certain cases of oral candidiasis, potentially due to resistant Candida species or underlying factors that were not fully addressed.

Side Effects Observed During Treatment [Table 6]
The majority of patients (73.33%, 22 patients) did not experience any side effects during treatment, indicating that the antifungal therapies were generally well-tolerated. However, mild gastrointestinal (GI) distress was reported by 16.67% (5 patients), and skin rash was observed in 6.67% (2 patients). One patient (3.33%) experienced other unspecified side effects. These findings underscore the importance of monitoring for adverse effects during antifungal treatment, especially when systemic therapies are used.

Follow-Up and Recurrence [Table 7]
During the follow-up period, recurrence of oral candidiasis was observed in a small number of

patients. Two patients (6.67%) experienced recurrence within the first week, while one patient each (3.33%) reported recurrence at the 2-week and 4-week marks. The relatively low recurrence rate suggests that the treatment regimens were generally effective, though the cases of recurrence highlight the need for continued monitoring and possibly prolonged antifungal therapy in certain patients to prevent relapse.

Table 1: Demographic Profile.

Parameter	Number /Mean	Percentage
Age (mean ± SD)	45.76 ± 12.26 years	
Gender		
Male	20	66.67
Female	10	33.33
Average Duration of Symptoms (weeks)	3.13 ± 1.15 weeks	
Smoking Status		
Yes	9	30
No	21	70

Table 2: Clinical Presentation of Oral Candidiasis

Clinical Feature	Number of Patients (n=30)	Percentage (%)
White Plaques	20	66.67
Erythematous Lesions	15	50.0
Pseudomembranous Patches	10	33.33

Table 3: Microbiological Findings

Candida Species Identified	Number of Isolates (n=30)	Percentage (%)
Candida albicans	22	73.33
Candida glabrata	5	16.67
Candida tropicalis	2	6.67
Candida parapsilosis	1	3.33

Table 4: Treatment Response

Treatment Regimen	Number of Patients (n=30)	Percentage (%)
Topical Antifungals	12	40.0
Systemic Antifungals	10	33.33
Combination Therapy	8	26.67

Table 5: Treatment Outcome at 4 Weeks

Outcome	Number of Patients (n=30)	Percentage (%)
Complete Resolution	20	66.67
Partial Resolution	8	26.67
No Improvement	2	6.66

Table 6: Side Effects Observed During Treatment

Side Effect	Number of Patients (n=30)	Percentage (%)
None	22	73.33
Mild GI Distress	5	16.67
Skin Rash	2	6.67
Others	1	3.33

Table 7: Follow-Up and Recurrence

Follow-Up Period	Patients with Recurrence (n=30)
1 Week	2
2 Weeks	1
4 Weeks	1

DISCUSSION

The demographic profile of this study's population shows a mean age of 45.76 years, with a standard deviation of 12.26 years. This is consistent with findings from other studies, which often report that oral candidiasis tends to affect middle-aged adults. For instance, a study by Shulman et al. (2016) reported a similar age range, with the average age of patients being around 50 years.[11] The gender distribution in our study, with a predominance of males (66.67%), aligns with other research that also suggests a higher incidence in males. For example, Farah et al. (2010) observed a higher prevalence of oral candidiasis in males, which might be attributed to behavioral factors such as higher tobacco and alcohol use in men, which are known risk factors for oral candidiasis.[12] In our study, 30% of the patients were smokers, which is slightly lower than the 40% smoking rate reported in other studies, such as by Lalla et al. (2013).[13] The lower percentage in our study might suggest that while smoking is a risk

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factor, it may not be as significant in this population or could be confounded by other variables such as the use of oral hygiene products or dietary habits. The clinical presentation in this study revealed that white plaques were the most common feature (66.67%), followed by erythematous lesions (50%) and pseudomembranous patches (33.33%). These findings are in line with the study by Odds et al. (2012), which also reported white plaques as the most frequent presentation of oral candidiasis.[14] The presence of erythematous and pseudomembranous forms in our study highlights the variability in clinical manifestations, which is critical for clinicians to recognize. This variability is supported by the work of Akpan and Morgan (2002), who emphasized that oral candidiasis can present in multiple forms, making accurate diagnosis and appropriate treatment essential.[15] The predominance of Candida albicans (73.33%) in our study is consistent with numerous studies that identify C. albicans as the most common species in oral candidiasis. For example, a study by Samaranayake et al. (2009) reported a similar prevalence, with C. albicans being responsible for 70-80% of cases. The presence of non-albicans species, such as C. glabrata (16.67%) and C. tropicalis (6.67%), underscores the need for species-specific identification, as non-albicans species can have different antifungal resistance profiles, making them more challenging to treat.[16] This finding is supported by research from Pfaller and Diekema (2010), which showed an increasing incidence of non-albicans Candida species, particularly in immunocompromised patients, but also noted in immunocompetent individuals.[17] The treatment response in this study varied, with 40% of patients receiving topical antifungals, 33.33% systemic antifungals, and 26.67% combination therapy. This distribution suggests that while topical antifungals are often the first line of treatment, systemic or combination therapies are necessary for more severe cases. This is corroborated by a study by Pappas et al. (2009), which found that systemic treatment is often required for more extensive or recalcitrant cases of oral candidiasis.[18] The reliance on combination therapy in a significant portion of patients also suggests the presence of more severe or treatment-resistant forms of candidiasis, as supported by the findings of Calderone and Clancy (2012), who noted the challenges in treating severe candidiasis.[19] At the 4-week mark, our study found that 66.67% of patients achieved complete resolution of symptoms, which is comparable to the 70% cure rate reported by Lalla et al. (2013) in similar studies. The 26.67% of patients who experienced partial resolution and the 6.66% who had no improvement highlight the challenges in treating oral candidiasis, particularly in cases involving resistant species or underlying conditions that complicate treatment.[13] This partial or non-response rate is consistent with findings by Epstein et al. (2002), who noted that a subset of patients may require prolonged or repeated treatment, especially in cases involving non-albicans species.[20] The side effects observed in this study were relatively mild, with 73.33% of patients reporting no side effects. This is similar to findings from other studies, such as that by de Paula et al. (2015), where the majority of patients tolerated antifungal treatments well.[21] However, the 16.67% of patients experiencing mild gastrointestinal distress and the 6.67% with skin rashes highlight the importance of monitoring and managing potential adverse effects, particularly when systemic antifungals are used, as noted by Pappas et al. (2009).[18] The recurrence rate in our study was relatively low, with only 6.67% of patients experiencing recurrence within the first week and an additional 3.33% at the 2-week and 4-week follow-ups. These findings suggest that the treatment regimens used were generally effective, but the presence of any recurrence underscores the importance of follow-up to prevent relapse. This low recurrence rate is slightly better than the 10-15% recurrence rates reported in other studies, such as that by Williams et al. (2011), possibly reflecting differences in patient compliance or the effectiveness of the combination therapy used in our study.[22]

CONCLUSION

This study highlights the diverse clinical presentations of oral candidiasis in immunocompetent patients, emphasizing the importance of thorough clinical and microbiological evaluation for accurate diagnosis. The findings demonstrate that while Candida albicans remains the predominant species, other non-albicans species also play a significant role. Treatment outcomes were generally favorable, particularly with combination therapy. The study underscores the need for personalized treatment approaches based on the severity and specific Candida species involved to ensure optimal patient outcomes.

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