Oropharyngeal Candidiasis Associated with Use of Steroid Inhaler in a Chronic Asthmatic Patient: Case Report
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Abstract
Candidiasis or oral thrush is a fungal infection caused by any of the Candida species, of which Candida albicans is the most common etiological agent. The infection caused by Candida albicans is called as candidiasis. Candidiasis is often dubbed as the ‘disease of the diseased’ as it sets in when the immunity of the host or the host defense is suppressed or compromised. One of the complications that may be associated with long-term use of steroid inhalers may be the occurrence of nasopharyngeal or oropharyngeal candidiasis. Whenever an asthmatic patient who is on steroid inhalers reports with oral mucosal lesion, steroid-induced oropharyngeal candidiasis must be suspected. This is a case report of a 55-year old male patient who was on steroid inhaler and presented with oropharyngeal candidiasis.

Keywords: Candida Albicans; Candidiasis; Chronic Mucocutaneous; Oral; Immunosuppression; Bronchial Asthma.

Introduction
Candidiasis or oral thrush is a fungal infection caused by any of the Candida species, of which Candida albicans is the most common variety. Oral candidiasis is also known as oral candidosis, moniliasis, oral mycosis, oral yeast infection or candidal stomatitis.1 Traditionally, oral candidiasis is divided into either acute or chronic candidiasis. Recently, candidiasis is classified into primary oral candidiasis where the condition is confined to the mouth and secondary oral candidiasis where there is involvement of other parts of the body in addition to the mouth.2 Most candidal infections are treatable and result in minimal complications such as redness, itching and discomfort, though complication may be severe or fatal if left untreated in certain populations. This mainly occurs in patients who are in a severely immunocompromised state.

In immunocompetent persons, candidiasis is usually a much localized infection of the skin or mucosal membranes, including the oral cavity (thrush), the pharynx or esophagus, the gastrointestinal tract, the urinary bladder, or the genitalia. A weakened or undeveloped immune system or metabolic illnesses such as diabetes mellitus or prolonged immunosuppressive therapy are significant predisposing factors for candidiasis. Diseases or conditions linked to candidiasis include human immunodeficiency virus (HIV) infection or acquired immunodeficiency syndrome (AIDS), infectious mononucleosis, cancer treatments, steroid therapy, stress, and nutritional deficiency.3,4

The organisms are buried in the superficial layers of the epithelium and the treatment should be aimed at having the antifungal agent in contact with the affected areas (topical application). The antifungal drugs commonly used to treat candidiasis are clotrimazole, nystatin, fluconazole, and ketoconazole.5 This is the rationale behind administering topical anti-fungal medications in the treatment of candidiasis and antifungal therapy may have to be instituted at least for about 14 days.

Although no oral lesions occur directly from bronchial asthma, indirect effects of asthma drug therapy can cause clinical lesions. Patients most prone to develop oral manifestations are chronic asthmatics who use corticosteroid inhalants. Corticosteroid inhalers are the main-stay therapeutic agents in the management of bronchial asthma.6 Repeated contact of steroid inhalant on the oral mucosa can result in the development of acute pseudomembranous candidiasis (oral thrush) because of fungal overgrowth in an area of localized immunosuppression.6,7 This steroid-induced infection consists of Candida albicans...
colonies that appear as curdy white lesions located commonly on the soft palate and oropharynx. Eventually the white precipitates peel off leaving behind an intensely erythematous and raw-looking area. The lesions are usually asymptomatic. However, wiping the plaques reveals a red, raw or bleeding mucosal surface. Dysphonia, hoarseness of voice and pharyngeal discomfort may be concurrent and serve as additional signs of persistent steroid inhalant use. Patients may also complain of burning sensation while taking spicy food as in Indian subcontinent where the consumption of chillies is high.

Case Report
A 55 years old male patient reported to the department of Oral Medicine and Radiology with a complaint of roughness and peeling off of tissue in the mouth since two to three months. His mouth was apparently normal till three months back. Then the mouth became rough to feel. He had burning sensation while consuming spicy food and there was also an itching sensation. He gave a history of bronchial asthma since ten years. Frequently he was using a bronchodilator inhaler for the past seven years and about three months back he changed to a steroid inhaler as prescribed by the patient’s physician. On intraoral examination, erosive areas on dorsal surface of the tongue towards the tip were noted (Fig 1). Diffuse erythematous lesions over the soft palate, uvula, palatoglossal folds and oropharynx with scrapable white patches were also noted (Fig 2). On gently rubbing these white patchy areas, erythematous underlying mucosa was visible with a tendency to bleed. There were also fine bleeding spots. The erythematous areas had a diffuse appearance. The lesions considered in the differential diagnosis were erythroplakia, erosive lichen planus and allergic stomatitis.

A smear was made from the scraping of the lesion and sent for cytological evaluation. The report was conclusive for candidiasis. The patient was advised to discontinue the use of steroid inhalers and was advised to continue bronchodilator inhaler after consulting the patient’s physician. Patient was also advised topical application of clotrimazole paint three times a day and for two weeks. Patient was evaluated after three weeks and there was complete remission of the lesion.

Discussion
Fungal infections rank third among the infections caused by microorganisms after viral and bacterial infections. Unlike bacteria and viruses, the fungal cells are larger and their walls contain ergosterol and beta-linked polysaccharides. *Candida albicans* is a fungus that grows both as yeast form and filamentous cells and is the main causative agent of the opportunistic oral and genital infection in human beings. *Candida albicans* is present in the oral cavity of about 80% of the human population in the oral cavity, gastrointestinal tract and without causing any harmful effects and as a normal commensal. Overgrowth of the fungus results in candidiasis (candidosis). Candidiasis usually sets in when the immunity of the host defence is lowered due to a variety of causes.

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discomfort or pain, though complications may be severe or fatal if left untreated in certain populations and in those patients whose immunity is severely compromised. In normal people, candida species is present in lower concentrations (less than 200 cells per ml of saliva). The overgrowth of the fungus results in candidiasis (candidosis), the term given for infection caused by Candida albicans. A higher concentration of Candida organisms are required for causing the infection. In a majority of cases, candidal infection sets in when the immunity of the host is reduced due to a variety of factors such as prolonged antibiotic or immunosuppressive therapy, cancer chemotherapy or radiotherapy, diabetes mellitus in infants or elderly patients, denture users, patients with oral mucosal lesions as secondary infection, leukemia etc.

Bronchial asthma is a respiratory disorder which is associated with a high incidence, prevalence and mortality rate and the prevalence among the general population is increasing in the recent past. The disease is characterized by dyspnea, shortness of breath, coughing and wheezing due to the narrowing of the bronchial airways by muscle spasm, mucosal swelling or nasal and bronchial secretions. An immune complex allergic reaction is suggested to be the etiological factor. The obstruction to airflow is more pronounced during expiration. It is a very serious health problem among children, young adults and adults. The airflow obstruction in bronchial asthma is mainly as a result of chronic inflammatory disease of the airways characterized by air flow obstruction. The air flow obstruction is usually reversible, but complete it may not be reversible in all the cases. It may be an acute life-threatening attack or chronic with mild to moderate or severe symptoms. Management of bronchial asthma includes avoidance of allergens, hyposensitisation of allergens, oxygen administration, inhalation of bronchodilators or corticosteroids and administration of systemic corticosteroids.

Oropharyngeal or nasopharyngeal candidiasis is one of the complications associated with long-term steroid therapy, especially in patients with bronchial asthma. However, this is often misdiagnosed or ignored. Dental professionals have a significant role to play in identifying these lesions and to institute appropriate management measures. Carefully recording the medical history is important in identifying this clinical problem. Though topical antifungal therapy is efficacious in the management of oropharyngeal candidiasis, institution of anti-candidal therapy alone is not sufficient in asthmatic patients who continue to use steroid inhalers. The most appropriate management measure is to change the medication to a non-steroid type after consulting the patient’s physician and then concomitantly instituting anti-candidal therapy. If the patient is on steroid inhalers, it would be prudent on the part of the clinician to examine the oropharyngeal and nasopharyngeal mucosae for the development of candidiasis. The initial lesions appear as erythematous areas and later on the lesions can become very extensive often acquiring greyish pseudo membrane. Peeling of the pseudo membrane reveals raw areas with a tendency to bleed.

In the reported case, the steroid inhaler was substituted after consulting the patient’s physician and the patient was advised topical application of cotrimoxazole paint. One thing that needs to be borne in mind while treating a patient with oropharyngeal candidiasis is to advise the patient to use antifungal medication at least for two weeks for the complete elimination of the infection. When the patient was evaluated in the follow-up visit, there was complete resolution of the symptoms.

Conclusion
Candida albicans is a common commensal of the oral cavity and overgrowth of the fungus results in candidiasis. Candidiasis is often described as the “disease of the diseased” is an opportunistic infection seen mainly in the immunocompromised host. Local candidal infection may also be associated with the use of dentures, especially in patients who do not cleanse the dentures and keep the denture in the night time also. Though not very common, repeated contact of steroid inhalant used for the treatment of bronchial asthma, on the oral mucosa can result in the development of acute pseudomembranous candidiasis (oral thrush) because of fungal overgrowth in an area of localized immunosuppression. In this patient, candidiasis developed in the tongue, oropharyngeal and palatal regions. These are the areas where the steroid inhalants must have come in contact with the oral mucosa. Though not so common, whenever a patient who is on steroid inhalers reports with oral mucosal lesions,
especially in the areas previously described, steroid-induced oral candidiasis must be suspected. In such patients, administration of appropriate anti-fungal medication greatly helps in reducing the symptoms and controlling the infection.

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