A CASE REPORT ON ORAL CANDIDIASIS INDUCED BY INHALER CORTICOSTEROIDS

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ABSTRACT
Candidiasis is a fungal infection caused by yeasts from the genus Candida. It is commonly called oral candidiasis or thrush when it affects the mouth. It is one of the common side effects associated with the long term use of steroid inhalers. Nebulizing therapy with corticosteroids is widely accepted treatment approach for patients with acute exacerbations of Chronic Obstructive Pulmonary Disease. The other side effects of steroid inhalers include hoarseness of voice and dysphonia, which are usually ignorable. We report this case of 74 year old male patient who was on metered dosage inhaler and nebulizer therapy with corticosteroid and presented with oral candidiasis. If oral thrush develops, treatment with oral fluconazole or nystatin mouth wash is beneficial. Proper patient education by the clinical pharmacist to the patient regarding safe and effective usage of inhalers and nebulizers especially corticosteroids can minimize these drug related problems.

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INTRODUCTION

It is identified by the presence of well-documented curdy white plaques. Curdy white lesions are displayed in the form of a membrane and are reservoir for *Candida albicans*[1]. It is also termed by other words such as oral yeast infection, candidal stomatitis, oral candidosis, oral mycosis and moniliasis[2]. Candidiasis is categorized into primary oral candidiasis in which the condition is only confined to mouth where as in secondary oral candidiasis the condition is confined to other body parts in addition to mouth[3]. After viral and bacterial infections, fungal infections stands third among total infections caused by microorganisms[4]. *Candida albicans* is the important fungal species responsible for oral candidiasis. Other important species which have been found to cause candidiasis are *candida tropicalis, candida krusei* and *candida stellatoidea*[5]. Predisposing factors for candidiasis include suppressed or compromised immunity, long term administration of immunosuppressant’s. The other conditions that play a prominent role in the development of candidiasis are administration of chemotherapy, human immuno deficiency virus (HIV) infection, nutritional deficiencies, stress and usage of steroids[6,7]. The fungal organism is buried underneath the superficial layers of epithelium. Hence the mainstay for treatment is topical application of antifungal agents like fluconazole, nystatin, clotrimazole and ketoconazole[8].

Frequent usage of steroid inhalers will increase contact of drug with oral mucosa and it leads to immunosuppression in the localized oral mucosa which further causes overgrowth of fungal species. Chronic asthmatics who are on inhaler steroids are more prone to develop oral candidiasis[9,10]. The colonies appear as curdy white lesions on tongue, soft palate, gums and buccal mucosa. Gradually, the curdy white precipitates peel off and it leaves behind an raw-looking oral severe erythematous area. The lesions usually are asymptomatic. The patient usually complaints of burning sensation while taking foods. Along with candidiasis persistent usage of steroid inhalers may additionally cause pharyngeal discomfort, hoarseness of voice, dysphonia[11,12]. Oropharyngeal candidiasis must be suspected whenever an asthmatic who is on long term steroid inhalers and complaints of burning sensation or oral mucosal lesions. Recently, nebulizer therapy with short acting corticosteroids such as fluticasone or budesonide are commonly given to patients[5].

CASE REPORT

A 74 year old male patient reported to the department of General Medicine with complaints of shortness of breath and generalized weakness even during resting state. The patient was diagnosed with acute exacerbation of COPD with respiratory failure. The patient was known smoker and he gave up his habit two years back. The patient was on rescue therapy i.e., short acting β₂ agonist and inhaled corticosteroid from five years. In addition to that the patient frequently received Budesonide nebulizing therapy twice a day. The patient was prescribed with following prescription: Nebulizer Corticosteroid (Budesonide) twice a day, oral bronchodilator (Salbutamol) every 6th hourly and oral methylxanthine derivative (Deriphylline). On the fifth day of his admission the patient complaints of itching sensation, roughness of soft palate and burning sensation while taking food. On intraoral examination, we observed curdy white lesions all over tongue, buccal mucosa and soft palate (Figure-1). On gently rubbing this white patchy areas erythematous underlying mucosa was visible with a tendency to bleed. For cytological evaluation, a smear was made from scrapings of these lesions, and reports were supportive for candidiasis.

![Figure-1: Curdy white lesions.](image-url)

To establish the relationship between drug and suspected reaction we performed causality assessment using Naranjo's scale, WHO probability scale and Karch and Lasagna's scale (Table-1). We further analyzed this reaction to find the severity with Modified Hartwig and Siegel scale, predictability based on the pharmacological action and preventable with Schumock and Thornton Preventability Scale (Table-2). The patient was advised to discontinue nebulizer corticosteroid therapy for a while. As the patient is experiencing acute exacerbation of COPD, we did not recommend stopping rescue therapy (Metered dosage inhaler containing levosalbutamol and beclomethasone dipropionate). We advised the patient to use spacer while using MDI. Rinse or gargle his mouth after every dose of inhaled corticosteroid, but do not swallow the gargled water.
### Table-1: Causality assessment of suspected ADR.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>ADR Scale</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WHO-UMC</td>
<td>Probable</td>
</tr>
<tr>
<td>2</td>
<td>NARANJO'S</td>
<td>Possible</td>
</tr>
<tr>
<td>3</td>
<td>KARCH AND LASAGNA</td>
<td>Conditional</td>
</tr>
</tbody>
</table>

### Table-2: Analysis of suspected ADR.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Assessment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Severity</td>
<td>Moderate level:3</td>
</tr>
<tr>
<td>2</td>
<td>Preventability</td>
<td>Probably preventable</td>
</tr>
<tr>
<td>3</td>
<td>Predictability</td>
<td>Predictable</td>
</tr>
</tbody>
</table>

### DISCUSSION

Cells of immune system such as macrophages, lymphocytes and neutrophils control fungal infections. Either systemic or oral corticosteroid treatment, immunosuppressive therapy targeting these cells, and immunodeficiency diseases are important risk factors for fungal diseases [5]. The genus *Candida* comprises of more than 150 species, only a few of which cause disease in humans. Human pathogens are *Candida albicans*, *Candida krusei*, *Candida guilliermondii*, *Candida glabrata*, *Candida kefyr* and *Candida lusitaniae*. *Candida* is small, thin-walled, ovoid yeast that measures 4-6 µm in diameter and it multiplies through the process of budding. Organisms of this genus occur in three forms in tissues: blastospore, pseudohyphae and hyphae. These organisms are ubiquitous in nature found on inanimate objects, foods, animals and are normal commensals of humans. They commonly reside in gastrointestinal tract (including mouth and oropharynx), the female genital tract and skin[12].

For severe asthmatics, higher dosage of inhaled steroids or frequent usage of these medications can also lead to the development of thrush.

If thrush develops person may need treatment with nystatin mouthwash or oral fluconazole. Some people require periodic rinsing (once daily to few times per week) with nystatin in order to keep thrush from coming back.

### CONCLUSION

In conclusion, we report a case of inhaler corticosteroid induced oropharyngeal candidiasis. These type of reactions are common in patients receiving inhaler and nebulizer corticosteroids. So, we strongly recommend that assessment should be made rapidly and prompt interventions must be implemented and followed to reduce this adverse effect among the patients receiving nebulizer or inhaler corticosteroid therapy. If oral thrush develops, treatment with oral fluconazole or nystatin mouth wash may be beneficial. We recommend further research.

Physicians may direct the patients to the clinical pharmacist for advise, patient counseling and close monitoring of therapeutic outcomes which minimizes these drug related problems and improves patient compliance.

### Conflict of interests

The authors have declared that they have no conflict of interest.
REFERENCES