

Incidence of Oral Candidiasis in Patients with Asthma Using Inhaled Corticosteroids by Various Inhaler Devices

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ABSTRACT

Objective: The aim of this study was to do the comparison of the incidence of oral candidiasis in individuals with inhaled corticosteroids by Rota caps via Revolizer and metered dose inhalers via spacer.

Place and Duration: This Cross-sectional study was held in the Pulmonology department of Gulab Devi Hospital, Lahore for six-months duration from March 2021 to August 2021.

Methods: Patients with asthma who were referred to chest clinics and used MDI inhaled corticosteroid with spacer or Rota cap with Revolizer for minimum two-months were alienated into 2 groups. The A Group included patients using metered dose inhalers with spacer and inhaled steroids and group B patients using Rota caps with Revolizer. The treating physician examined all patients for oropharyngeal candidiasis, and a thorough throat examination in patients was done who reported dysphonia or throat ache.

Results: Of 120 patients (group A: 60 and group B: 60) who participated in the analysis, 72 (60%) were female and 48 (40%) were male. Their ages fluctuated from 15 to 75 (mean 43.2). 89 patients (74.2%) were encompassed in the analysis with moderate asthma and severe asthma was noted in 31 patients (25.8%). 39 patients (32.5%) described throat ache; 81 patients (67.5%) did not have such symptoms. The oral candidiasis incidence was noted in 18 (15%) in group B patients who used Rotacaps encompassing 6mcg and Formoterol Fumerate 400 mcg Budesonide and 12 (10%) in group A patients using MDI containing Salmeterol xinafoate 25 and Fluticasone propionate 250 mcg with spacer device. It was advanced in B group patients than A group ($p < 0.05$). The oral candidiasis incidence in individuals over 50 years was also higher than patients under 50 years.

Conclusion: This analysis exhibited a high proportion of oral candidiasis among individuals using Rota caps containing formoterol and Budesonide by Revolizer in comparison to metered dose inhalers with spacer.

Keywords: Oral candidiasis; Asthma; Inhaled corticosteroids

INTRODUCTION

Inhaled corticosteroids, a long-lasting inflammatory disease of the air pathways, are the utmost operative 1st-line management for asthma¹⁻². The policies commend corticosteroids in inhaled form as first-line treatment for all stages of asthma and for all age groups³⁻⁴. Low doses of inhaled steroids may be sufficient for mild to moderate asthma, while higher doses are required to manage moderate to severe persistent asthma⁵. It is necessary to add a long-acting beta-agonist, such as salmeterol or formotrol, which has not yet been tested, is in combination with inhaled steroids, and both can be given in one breath. Since the two molecules that reach the respiratory system together can act synergistically, this not only increases its effectiveness, but also increases patient acceptance⁶⁻⁷. Another option is to add leukotriene inhibitors such as Montelukast to the inhaled steroid⁸. Unfortunately, repeated usage of corticosteroids in inhaled form, particularly in high dosages, is associated with localized and systemic side effects. The side effects are serious and well known and are generally dosage reliant on and because 80% of the delivered dose is absorbed by an inhaler with MDI⁹. These include osteoporosis, adrenal suppression, thinning of the skin, bruising, glaucoma and cataract. Also, local complications such as oropharyngeal candidiasis, dysphonia, and hoarseness are rare and not significant, but are clinically relevant because they are much communal, occur rapidly during treatment, and are simply described by the patient. They can also make it difficult for patients to use devices¹⁰. The precise incidence of local complications is unknown, but various studies have reported an incidence of 5-10% to 58-60% depending on the type of study, follow-up time, and event recording methods. In Pakistan; usage of Inhaled corticosteroids is mainly in the MDI form¹¹. Few subjects are unable to practice them effectively in spite of repetitive directions. This delinquent can be overwhelmed by using large volume spacers and improving the efficiency of the inhaler to some extent, which also reduces complications. However, the issue with high-

volume inhalers is that they are problematic to transport and so have a negative impact on compliance of patients or effectively restrict patients in their homes¹². A study by the Talai et al found that patients with asthma receiving Mifflonide aerosol (400 µg budesonide) + furadil (Formotrol 12 µg) were more likely to develop oral candidiasis than other patients with using DPI ($p < 0.05$)¹³. There is no relevant information in our configuration for routes through Revolizer in Pakistan. The aim of this study was to do the comparison of the incidence of oral candidiasis in individuals with inhaled corticosteroids by Rota caps via Revolizer and metered dose inhalers via spacer.

MATERIALS AND METHODS

This Cross-sectional study was held in the Pulmonology department of Gulab Devi Hospital, Lahore for six-months duration from March 2021 to August 2021.

This study included all patients with asthma, regardless of age or gender, who referred to a pulmonary clinic and used inhaler corticosteroids with MDI using a Revolizer Rota Caps or spacer for minimum two months. Informed written consent was obtained from all subjects. Patients were divided into 2 groups. The A Group included patients using metered dose inhalers with spacer and inhaled steroids and group B patients using Rota caps with Revolizer. After recording clinical and personal information and a chest examination, any oropharyngeal abnormalities were evaluated, and patients who reported voice changes or voice insufficiency were referred to an ENT surgeon for additional assessment. Inspection of larynx and vocal cords was done by indirect laryngoscopy. All results were documented on a preforma and the outcomes were finally analyzed.

RESULTS

Of 120 patients (group A: 60 and group B: 60) who participated in the analysis, 72 (60%) were female and 48 (40%) were male. Their

ages fluctuated from 15 to 75 (mean 43.2). 89 patients (74.2%) were encompassed in the analysis with moderate asthma and severe asthma was noted in 31 patients (25.8%). 39 patients (32.5%) described throat ache; 81 patients (67.5%) did not have such symptoms.

Table 1: Features of Patients with Asthma

	Group A (n= 60)	Group B (n=60)
Male	26 (54.2%)	22 (45.8%)
Female	33(45.8%)	39 (54.2%)
Age	Mean 43.8 years	44.4 years
Mean duration of asthma medicine used	7.96 months	6.31 months
Severity of asthma:		
Moderate	46 (51.7%)	43 (48.3%)
Severe	16 (41.1%)	23 (58.9%)

The oral candidiasis incidence was noted in 18 (30%) in group B patients who used Rotacaps encompassing 6mcg and Formeterol Fumerate 400 mcg Budesonide and 12 (20%) in group A patients using MDI containing Salmeterol xinafoate 25 and Fluticasone propionate 250 mcg with spacer device. It was advanced in B group patients than A group (p <0.05). The oral candidiasis incidence in individuals over 50 years was also higher than patients under 50 years. (Table 2).

Table 2: Oral and Laryngeal Findings in Patients Using ICS by Different Devices

Group of patients	Total number of patients	Oral Candidiasis n=(%)
Group A	60	12 (20%)
Group B	60	18 (30%)
Age < 50	65	5 (7.7%)
Age > 50	55	9 (16.4%)
Dysphonia:		
Present	39	6 (15.38%)
Absent	111	12 (10.81%)

DISCUSSION

In this analysis, the incidence of oral candidiasis in patients with asthma (group A) using Rota capsules containing budesonide + formotrol with Rolliser was higher than patients receiving a measured dose inhalation containing fluticasone + salmeterol with a spacer (group B). This difference may be due in part to differences in the molecules of corticosteroid used, as they were not the similar in both groups, budesonide group B and fluticasone group A¹³. Though, all steroids in inhaled form work by common glucocorticoid receptor binding, a clinical consequence may be present¹⁴. It is available with all steroids in inhaled form, though not constantly in the similar dose. Correspondingly, there are variances in the side effects of various inhaled steroids prescribed to attain the same clinical effect, but their relevance remains controversial¹⁵. Another reason for the difference in the incidence of this side effect may be the difference in the distribution of steroid molecule mechanism. Inhalation of dry powder uses lactose as a bulking agent to help absorb powder from the device during inhalation¹⁶. The high content of lactose as dry inhaled powder and Rotahaler may cause more steroids to be absorbed into the oral cavity and larynx, leading to oral candidiasis¹⁷. Twenty-three different meta-analysis showed that MDI and DPI at all doses significantly increased the oral candidiasis risk, pharyngitis and dysphonia compared with placebo. A randomized and controlled trials meta-analysis showed that budesonide was related with an advanced jeopardy of dysphonia compared to fluticasone and beclomethasone¹⁸. Budesonide was related with an increased dysphonia risk in comparison with fluticasone compared with high-dose ICS. Our results show that most asthmatic patients who use inhaled steroids via MDI and DPI can develop oropharyngeal disorders¹⁹⁻²⁰. For an early diagnosis of this complication, a thorough examination by an ear, nose and throat specialist is necessary, because patients can only complain of dysphonia and severe discomfort²¹⁻²². This analysis had numerous limits. First, we

ultimately did not exclude patients at high risk for oropharyngeal candidiasis, such as diabetes, immunocompromised patients taking certain medications such as steroids or antibiotics, or enduring radiation or chemotherapy therapy for cancer patients, circumstances that cause dry mouth and wearing dentures. The second drawback was that randomization was not very accurate. The help of an ear, nose and throat specialist should be greater in comprehensive and systematic examinations to diagnose problems in the vocal cords and larynx.

CONCLUSION

This analysis exhibited a high proportion of oral candidiasis among individuals using Rota caps containing formoterol and Budesonide by Revolizer in comparison to metered dose inhalers with spacer. More research, counting additional robust study design, and additional detailed examinations before and after oral and laryngeal treatment, may offer more comprehensive data on this subject.

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