



ORAL MANIFESTATIONS OF BRONCHIAL ASTHMA

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ABSTRACT

The aim of this study was to ascertain the hard tissue changes and mucosal changes in the oral cavity of bronchial asthma patients. Effect of the drugs of varied treatment protocol on the oral tissues was also correlated with the oral manifestations. A random study was conducted among 100 bronchial asthma patients (51 females and 49 males patients of all age groups and socio economic status were included). All bronchial asthma patients were under treatment depending on degree of disease condition. Data was analyzed statistically for students T test (by SPSS 11.5 software application). Oral mucosal changes predominantly Oropharyngeal candidiasis, ulcer, gingivitis, periodontitis and hard tissue changes in the oral cavity such as dental caries, erosion were clinically observed. Significant association was evident between the drugs used in bronchial asthma treatment, disease progression on the oral hard tissue and mucosal changes.

KEYWORDS: Bronchial asthma, Oropharyngeal Candidiasis, Dental caries, Xerostomia, Periodontitis, Bronchodilators, Corticosteroids.



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INTRODUCTION

“Asthma is defined as a chronic inflammatory disease of the airways. The chronic inflammation is associated with airway hyperresponsiveness (an exaggerated airway narrowing response to triggers, such as allergens and exercise), that leads to recurrent symptoms such as wheezing, dyspnoea (shortness of breath), chest tightness and coughing” (Davidson’s et al., 2006). Asthma is a disease characterized by periods of exacerbations. The etiology is multifactorial. Environmental pollutants, allergens, industrial fumes, physical stress such as exercise, occupational exposures to chemicals and other triggers such as wooden dust etc and viral infections especially rhinovirus play an important role (Annemarie Sykes et al., 2008). Even genetic factors are involved. Individual genes and their interaction with each other, environmental influence on the genes may pose a positive or deleterious effect on the pathogenesis of bronchial asthma. Candidate genes and Single Nucleotide Polymorphism play an important role (Mahdi Bijanzadeh et al., 2011). A strong family history is also seen in the occurrence of bronchial asthma. Psychosomatic conditions and certain drugs such as acetyl salicylic acid and iodides play the role of exacerbating factor in bronchial asthma (Albert R Rowe et al., 1949). The disease progression depends on the degree of allergen sensitisation in the pulmonary tissues. Bronchial asthma, worldwide contributes to impairment of daily activity and quality of life, eventually leading to high rate of morbidity.

ETIOLOGY

Occurrence and prevalence of bronchial asthma depends on various etiologic factors. The degree and progression of the disease is contributed greatly by multifactorial such as allergens, chemical inhalants, psychosomatic causes, viral infection especially rhinovirus (Annemarie Sykes et al., 2008), respiratory tract infection, food allergens, drugs such as aspirin, several non steroidal and anti-inflammatory drugs (Albert R Rowe et al., 1949), allergens, psychosomatic factors. The host allergic sensitization, IgE-mediated reactions formed the basis to acute symptoms and chronic airway inflammation in bronchial

asthma. The aspirin triad consisting of episode of asthma exacerbation, nasal polyps, as a result of aspirin sensitivity was observed. Rhinorrhea, lacrimation of eye was also seen associated. Reflux bronchospasm due to irritation of esophagus results in Gastro Esophageal Reflex Disorder (Robert F Lamanske, 2006) .Generally bronchodilators, both in inhaled aerosol as well as powder form is the first line of treatment for bronchial asthma. Leukotrienes, corticosteroids are also advised depending upon the severity of bronchial asthma. All drugs are reported to have an effect on the oral mucosa when they are deposited locally. They are potential sources of candidal colonisation in the oropharyngeal region. Ulceration is also reported (Navneet Godara el al., 2011).The drugs used in the bronchial asthma treatment have a xerostomic effect that eventually leads to dental caries, loss of taste sensation and dysphonia or alteration of tone of voice and hoarseness. Erosion of teeth, periodontitis are also reported in patients with bronchial asthma. Hence, It is of interest to study the oral manifestations of bronchial asthma.

MATERIALS AND METHODS

This study was conducted in a population of Southern Chennai to evaluate the Oral Manifestation and Changes of hard tissues and soft tissues of the oral Cavity in patients suffering from bronchial Asthma. The study sample consisted of 100 patients suffering from bronchial asthma. It was a random study. The patients were grouped based on clinical diagnosis and categorised as:

1. Mild
2. Moderate
3. Severe
4. Intermittent
5. Occupational

INCLUSION CRITERIA

Patients of all ages, children, young adults, adults, old patients under medication of bronchial asthma were included in the study and examined.

EXCLUSION CRITERIA

Immunosuppressed patients with diseases such as AIDS, epilepsy and patients with other serious systemic disorders were excluded from the study. Other respiratory disorders such as chronic obstructive pulmonary disorder, pleural effusion, lung abscess were excluded from the study.

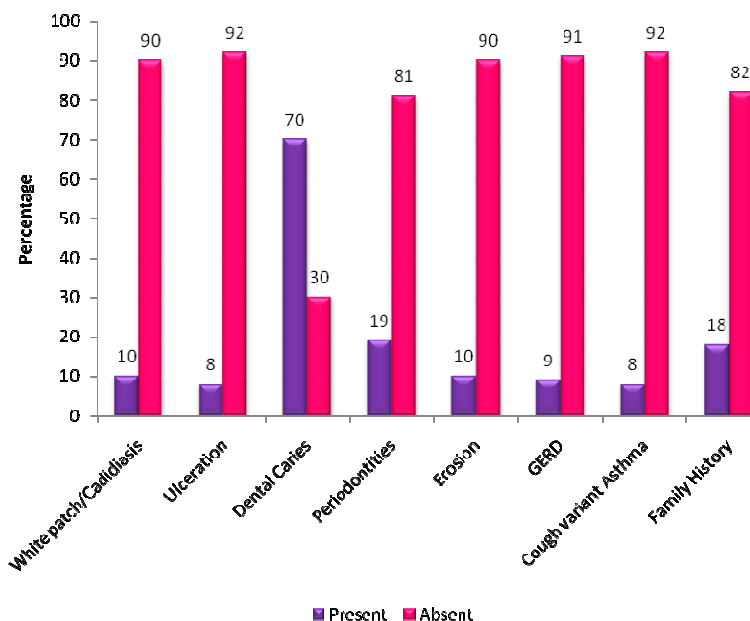
Assessing Parameters of patients included in the study

Pulmonary function test
Clinical history

RESULTS

The data obtained for the oral manifestations of bronchial asthma was statistically analysed. Patients of all age groups were included in the

study and was random in nature. Patient of 7 years of age as well as 86 years age were included. Candidiasis was seen in 10 % of cases and was present as white patch in the oral cavity, predominantly in the buccal mucosa, floor of the mouth and the faucial pillar region of the oral cavity. Ulceration was seen in 8% cases and patient clinically complained of burning sensation and development of ulcer after treatment of bronchial asthma. 70% of bronchial asthma patients reported of dental caries and 19% with periodontitis. Erosion of teeth was observed in 10% of bronchial asthma patients. Gastro esophageal reflux disorder was reported in 9% of patients. A positive family history of bronchial asthma was seen in 18% of cases and 8% of cases were categorised as cough variant asthma.



DISCUSSION

Oropharyngeal candidiasis was observed in 10 patients suffering from bronchial asthma that constituted 10 % of the study sample of which 6 were male patients and 4 female patients. Patients were under inhaled corticosteroids and bronchodilators predisposing highly to this condition. This is in accordance with the study conducted by Navneet Godara et al., (2011). Study conducted on bronchial asthma in the

literature revealed that the adverse effect oropharyngeal candidiasis contributed to the topical effects of the drugs on the oral mucosa as only 10 to 20 % of the dose from an inhaler reaches the lung and rest remained in the oropharynx. The local deposition of glucocorticoids was observed as a potential risk factor for oropharyngeal candidiasis. Mild alterations in taste perception was reported in

the review conducted. This was majorly attributed to the alterations in the taste buds and coating on the tongue due to the drugs used in the treatment. Ulceration was seen in 7 females and 1 male patient suffering from bronchial asthma. Drugs used in the treatment of bronchial asthma such as corticosteroids, beta 2 agonists were believed to predispose ulceration of mucosal lining, in accordance to the study conducted by Derendorf et al., (2006). The bronchodilators promoted thinning of mucosal lining, detachment of layers of mucosa that contributed to epithelial ulceration due to thinning of epithelium. A L Dulailami et al., (2011) have been reported a case of erythema multiforme in which the patient was under inhaled corticosteroid for the management of bronchial asthma and the erythema eventually subsided when the treatment protocol was intercepted with bronchodilators. Gingivitis and periodontitis was observed in the study conducted on bronchial asthma patients, in some patients of bronchial asthma. Mouth breathing habit in bronchial asthma patients predisposed the condition of gingivitis in which mouth breathing lead to dehydration of alveolar mucosa that contributed to periodontitis. This is in accordance to the study conducted by Navneet Godara et al., (2011).

19 patients of which 5 female patients and 14 male patients suffering from bronchial asthma were reported to have the condition of periodontitis. Effect of the drugs in treatment protocol and oral hygiene neglect could both contribute to the condition of periodontitis. Although many studies are in accordance to this, Jay D Shulman et al., (2003) conducted a study and concluded that there was no potential inter relationship between periodontitis and bronchial asthma. It was put forward in the study that only the co variates and other underlying factors that contributed to the condition of periodontitis. The hard tissue changes mainly included the dental caries in the study conducted to evaluate the oral changes and manifestations in bronchial asthma patients. In the study sample of 100 patients, around 70 patients reported positive for dental caries. Inhaled corticosteroids, beta 2 agonists, other drugs used in bronchial asthma could contribute to the condition of

dental caries. General oral hygiene neglect could also predispose the condition. The drugs produced a xerostomic effect in the oral cavity that can cause dental caries due to lack of salivary flow and generalised erythema of oral mucosa. This is in accordance to the review by Navneet Godara et al., (2011). The marked reduction in pH of the saliva that drops to critical level of 5.5. This pH can predispose enamel demineralisation contributing to dental caries. (Shashikiran et al., 2007) conducted a study on bronchial asthma patients that revealed that salbutamol group of drugs produced higher incidence of caries activity which is in favour of our study. They reported higher DMFS, DMFT scores. High caries was also reported by Ida Anjomshoaa et al., (2009) study revealed the inter relationship between caries activity and asthma. This finding of dental caries in bronchial asthma patients is also in accordance to J. D. Shulman et al., (2003) who put forward that 4-10 year old children with bronchial asthma had greater incidence of dental caries than children of other age group. The study by Eliza M Vazquez et al., (2011) is in contradiction and states that there is no association between asthma and dental caries. Only nocturnal asthma poses threat of dental caries and other covariates contribute to it.

Some patients even reported of lack of adequate salivation. xerostomia after the treatment of bronchial asthma. this is in accordance to the study conducted by Navneet Godara et al., (2011), Laurikainen K Kuusisto et al (1998) who reported a marked reduction in salivary flow rate of asthmatic patients after a study on 33 asthmatic patients and compared with 33 normal healthy persons. Erosion of tooth surfaces predominantly cervical portion of the tooth was also reported in the study of bronchial asthma patients. 10 patients reported this condition of which 5 were females and 5 were male patients. GERD (Gastro Oesophageal Reflux Disorder) was also found in the majority of the bronchial asthma patients who reported to have erosion of tooth. This is in accordance to the study conducted by Navneet Godara et al., (2011). This may be due to the acidic refluxes caused in the patients under medication of beta agonists for bronchial asthma. Cough

variant asthma cases were also taken in to consideration as 8 patients reported with similar symptoms of asthma. They mainly reported of continuous cough. They were under maintenance dose of bronchial asthma. Studies of Fujimara et al., (2003) reveals that patients with cough variant asthma reported with greater chances of developing bronchial asthma in the due course of time than patients with atopic cough. 18 patients revealed a positive family history of bronchial asthma in the study conducted to evaluate the oral changes in bronchial asthma patients. This is in accordance to the review of Mahdi Bijanzadeh et al., (2011) who postulated from their study a positive genetic predisposition of bronchial asthma other than environmental etiologic factors. The pedigree analysis revealed an autosomal recessive pattern of inheritance in bronchial asthma. Parental consanguinity, serum adhesion intercellular cell

adhesion molecule (ICAM) was seen associated with bronchial asthma.

CONCLUSION

Bronchial asthma is thus a potential condition that can predispose various oral manifestations. The drugs in the treatment protocol pose a significant effect on the oral mucosa and the oral hard tissues. Corticosteroids and bronchodilators are mostly employed in the treatment of bronchial asthma that locally deposit the drug in the oropharyngeal region that predominantly cause candidiasis, mucosal ulceration and other deleterious effects on the oral cavity. Stress should be laid on oral hygiene practices and prophylaxis methods especially for patients under local drug delivery system to minimise the effects on the oral tissues.

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