



## Oral Manifestations of Respiratory Diseases: Need for Oral Physician

Tanoj Kumar<sup>1</sup>, Mobeen Khan<sup>2</sup>, Chandra Prakash Gupta<sup>3</sup>, Shah Faisal<sup>4</sup>, Nazish Akhtar<sup>5</sup> and Divyanshu<sup>6</sup>

<sup>1</sup>Department of Oral pathology, Patna Dental College and Hospital, Patna, Bihar, India.

<sup>2</sup>Department of Oral medicine and Radiology, Chandra Dental College and Hospital Barabanki, Uttar Pradesh, India.

<sup>3</sup>Department of Orthodontics, Chandra Dental College and Hospital Lucknow, Uttar Pradesh, India.

<sup>4</sup>Department of Pedodontics and Preventive Dentistry, Chandra Dental College and Hospital Barabanki, Uttar Pradesh, India.

<sup>5</sup>Department of Oral medicine and Radiology, Seema Dental College and Hospital, Rishikesh, India.

<sup>6</sup>Department of Pedodontics and Preventive Dentistry, Chandra Dental College and Hospital Barabanki, Uttar Pradesh, India.

### ARTICLE INFO

#### Article history:

Received: 11 March 2017;

Received in revised form:

10 May 2017;

Accepted: 20 May 2017;

#### Keywords

Respiratory Diseases,  
Tuberculosis,  
COPD.

### ABSTRACT

With growing evidence regarding the association between oral health and respiratory disease, oral physician responsibility to provide top quality care is mandatory. By staying up to-date and using research available, oral physicians will be able to have the knowledge and skills to carry out proper assessment of patient, management, and prevention of the disease. Through this knowledge, the oral physicians will be able to educate patients regarding specific risk factors responsible for developing respiratory diseases and their prevention to avoid further complications. Besides, it will help to identify and manage those patients with associated problems. Oral physician should stay update with current research available, in order to educate the public and patients regarding the significance of good oral health.

© 2017 Elixir All rights reserved.

### Introduction

Interest has been progressing regarding the potential links between oral health and respiratory disease. Although sufficient publicity is not reaching to the public regarding respiratory health and its association with oral health. However significant literature is growing nowadays.<sup>1</sup> According to recent reports over thirty-five million Americans are found to be affected by any form of respiratory disease, varying from acute pulmonary infections to Chronic Obstructive Pulmonary Disease (COPD) including asthma, contributing to one-third of the most common reasons of death among Americans.<sup>2</sup> Pathogens found in the mouth are considered risk factors for a respiratory disease. Therefore, oral physicians should recognize oral conditions and pathogens that may cause respiratory infections earlier and play active role in slowing the progression of development of respiratory disease.<sup>3</sup> Recent research has suggested oral health and respiratory health may have a common connection, both affecting each other. This concept has developed due to presence of common bacteria being found in periodontal pockets as well as respiratory diseases.<sup>4</sup>

Measurements that are advised to establish connections between oral health and respiratory disease involve demographic and medical facts, deleterious habits like tobacco and alcohol, dental care awareness, salivary flow, and dental plaque cultures.<sup>5</sup> A health-related harmful habit such as smoking has been associated to both periodontal disease and COPD. Therefore, when oral physicians acquire knowledge of health-related behaviors, such as tobacco taking habit, they should include smoking cessation into their overall patient care. Cessation of smoking will decrease the risk for periodontal disease, further decreasing the risk of establishing a respiratory disease.<sup>6</sup>

Sincere examination of the oral cavity in respiratory speciality is often neglected, even though it represents an indication for clinical diagnosis making it important in addressing the patient. On the other hand, oral physician who treats a patient with unusual oral lesions should provide correct guidance and important medical advice. Oral manifestations are of varied nature, being associated with a variety of respiratory diseases and specific therapies.<sup>7</sup>

### Respiratory Diseases With Their Oral Manifestations Chronic Obstructive Pulmonary Disease

Smoking is believed to be one of the major risk factors for both COPD and oral disease like periodontal disease.<sup>8</sup> Epidemiological studies provide information regarding an association between COPD and periodontal disease. The most common link between these two conditions is association with tobacco smoke. Some studies indicate that COPD is associated with marginal bone loss. Other common manifestations are thrush - the most common oral mucosal lesion.<sup>9</sup> Besides there is destruction of the dental status like gingival bleeding and increased pocket depth, mobility of teeth, increased cases of dental plaque. In addition, these patients with respiratory disease have a denture plaque that is believed to be a reservoir of pathogens having potential to affect upper and lower airways. It is believed that lower respiratory tract is raided by aspirated pathogenic bacteria.<sup>10</sup>

### Tuberculosis

Tuberculosis (TB) is a chronic infectious granulomatous disease being caused by *Mycobacterium tuberculosis*, an acid-fast bacterium that is being transmitted primarily through the respiratory route by means of inhalation of infected airborne droplets possessing *M. tuberculosis*. Oral manifestations are usually in the form of ulcers, few nodules, some fissures, or small tuberculomas that can be present as single or multiple, painless or painful commonly affecting

tongue and hard palate. Oral cavity involvement in secondary tuberculosis is generally a result of reactivation and blood-borne spread from the primary infection of the lung, the lesions are found to very much like that of a squamous cell carcinoma.<sup>11</sup> Besides there are irregular ulcerations with abnormal peripheral thickening and irregular-appearing base. Generally biopsy and tissue culture being needed to confirm the granulomatous inflammation. Secondary oral tuberculosis generally leads to the diagnosis of pulmonary tuberculosis which is usually without symptoms. So, any undiagnosed oral ulcer must be examined properly considering other clinical findings as well as proper laboratory investigation in order to find the disease at the initial phase, which will decrease the morbidity and mortality of these patients.<sup>12</sup>

#### **Asthma**

The most common oral health conditions associated with asthma are dental caries and dental erosions, periodontal disease and oral candidiasis. The secretion of saliva is the main protective factor for oral health. In asthmatic patients, the administration of  $\beta$ 2-agonists reduces the salivary secretion rates by 25 to 35% as compared in non-asthmatics, affecting composition, and causing alteration in this important defensive barrier.<sup>13</sup> Furthermore, such patients, particularly belonging to pediatric age, have a common oral breathing pattern, contributing to gingivitis, leading to dehydration of alveolar mucosa, along with many immunological factors that increase gingival inflammation. Various elements like excessive thirst, the attempt to clean the taste of inhaled medication, in order to counterbalance the dehydrating effect of mouth breathing, and the decreased salivary flow as induced by  $\beta$ 2-agonists – as found associated with an excessive intake of cariogenic drinks.<sup>14</sup>

#### **Cystic Fibrosis**

Cystic fibrosis is a genetic disorder caused due to mutations in the gene for the cystic fibrosis named as trans membrane conductance regulator (CFTR) protein. It usually affect the respiratory tract, having problems like chronic cough and sputum along with dyspnea and recurrent infections. There is usually associated pancreatic insufficiency and malnutrition. Oral manifestations of cystic fibrosis include discoloration of tooth, enlargement of salivary gland, increased incidence of caries, proliferation of bacteria and malocclusions.<sup>15</sup> Cystic fibrosis commonly affects the mucous glands, hence the most commonly involved salivary glands include sublingual and submandibular salivary glands. Among them, the sublingual glands are usually composed of mucous acini and hence they are more affected as compared with the submandibular glands. The cases of caries have been reduced in children with cystic fibrosis, despite high intake of foods having sugars. This is due to reason as these children are taking an antibiotic which prevents the occurrence of caries, plaque and periodontal problems. Besides, there is alteration in the pH of saliva affecting buffering capacity causing added effect of the remineralisation of the tooth. However, these patients have high incidence of calculus.<sup>16</sup>

#### **Dental Considerations**

Many respiratory disorders generally affect routine dental care and require special treatment planning for the affected patients.

Patients usually visit the dental clinic with respiratory problems already being diagnosed by other respiratory specialists. The dental professional should provide correct dental care in the case of such diagnosis. Chronic obstructive pulmonary disease (COPD) and asthma patients need special

measures, such as dealing with the patient in the vertical position, because many subjects do not tolerate decubitus.<sup>17</sup> In addition patients with COPD generally suffer also with infectious lung diseases secondary to the aspiration of bacteria in the presence of poor periodontal conditions. The treatments provided to patients with respiratory diseases usually influence their oral health. In this respect, it has been found that inhaled medication used for asthma may cause oral diseases such as xerostomia, candidiasis as well as an increased incidence of caries along with gingivitis.<sup>18</sup>

#### **Conclusion**

This review gives significant knowledge regarding the various pulmonary disorders and their manifestations in the oral cavity. It is mandatory for the oral physician to know the signs and symptoms as well as oral presentations of the respiratory diseases to provide better dental care with safety precautions in order to avoid discomfort to the patient's health. Besides there should be regular oral examinations giving a glimpse for the diagnosis of important systemic illness like respiratory diseases. Hence, the oral manifestations of the respiratory diseases are usually required for early detection of the diseases so that the patients get the ultimate benefits from the services of oral physicians.

#### **Acknowledgement**

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

#### **References**

1. Comprehensive respiratory medicine. London: Albert R, Spiro S, Jett J. Mosby Inc.; 1999.
2. Doina-Clementina Cojocaru, Andrei Georgescu, Robert D. Negru. Oral manifestations in pulmonary diseases- too often a neglected problem. *International journal of medical dentistry*, 2015, 5 (2);117-123.
3. Baltch, A. L., H. L. Pressman, C. Schaffer, R. P. Smith, M. C. Hammer, M. Shayegani, and P. Michelsen. 1988. Bacteremia in patients undergoing prophylaxis as recommended by the American Heart Association, 1977. *Arch. Intern. Med.* 148:1084–1088.
4. Carroll, G. C., and R. J. Sebor. Dental flossing and its relationship to transient bacteremia. *J. Periodontol* 1980; 51: 691–692.
5. Ryberg M, Moller C, Ericson T. Saliva composition and caries development in asthmatic patients treated with beta-2 adrenoceptor agonists: a 4-year follow-up study. *Scand J Dent Res* 1991; 99: 212-218.
6. Al-Dlaigan YH, Shaw L, Smith AJ. Is there a relationship between asthma and dental erosion? A case control study. *Int J Paediatr Dent* 2002; 12: 189-200.
7. Maguire A, Rugg-Gunn AJ, Butler TJ. Dental health of children taking antimicrobial and non-antimicrobial liquid oral medication long term. *Caries Res* 1996; 30: 16-21.
8. Buhl R. Local oropharyngeal side effects of inhaled corticosteroids in patients with asthma. *Allergy* 2006; 61: 518-526.
9. Kelly HW, Nelson HS. Potential adverse effects of the inhaled corticosteroids. *J Allergy Clin Immunol* 2003; 112: 469-478.
10. Casiglia JM, Elston DM. Oral manifestations of systemic diseases. Medscape reference, <http://emedicine.medscape.com/article/1081029-overview>.

11. James Smith H. Leprosy and Tuberculosis Lesions. *International Journal of Leprosy and Mycobacterium Diseases*. 1982; Chapter 60:1-7
12. Peter M. Small and Mark A. Jaobson. Clinical Features of Tuberculosis in H.I.V. infected patients. 1973 ;135:122.
13. Bloom B.R. and Murray G.T. Tuberculosis commentary on a reemergent killer. *Science* 1992;257:1055-1064.
14. Shashikiran ND, Reddy VV, Raju PK. Effect of antiasthmatic medication on dental disease: dental caries and periodontal disease. *J Indian Soc Pedod Prev Dent*. 2007; 25:65-8.
15. Steinbacher DM, Glick M. The dental patient with asthma. An update and oral health considerations. *J Am Dent Assoc*. 2001; 132:1229-39.
16. Cleveland JL, Robison VA, Panlilio AL. Tuberculosis epidemiology, diagnosis and infection control recommendations for dental settings: an update on the Centers for Disease Control and Prevention guidelines. *J Am Dent Assoc*. 2009; 140:1092-9.
17. Tovar S, Costache M, Sardella A. Primary oral tuberculosis: a case series from Bucharest, Romania. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2008; 105:e41-5.
18. Ajay GN, Laxmikanth C, Prashanth SK. Tuberculous ulcer of tongue with oral complications of oral antituberculosis therapy. *Indian J Dent Res*. 2006; 17:87-90.