

Polymicrobial infectious ailments: Chief aggravation of pulmonary diseases.

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Abstract

A variety of polymicrobial infection conditions known as periodontal diseases, including gingivitis and periodontitis, affect the tissues that support the teeth and have been associated to exacerbating a number of pulmonary conditions. A major portion of poor quality of life and mortality is caused by lung disorders like pneumonia, chronic obstructive pulmonary disease, asthma, TB, covid-19, and bronchiectasis. It's crucial to continue to focus on the link between periodontal disease and lung outcomes. The mouth, lungs, and other areas of the body are home to a variety of bacteria. To change the aspiration of oral periodontopathic bacteria into the lungs and alter inflammatory reactions, changes in the normal micro flora brought on by oral disease, ageing, lifestyle choices, or dental intervention may be responsible. In the same way, periodontal disorders are linked to the steady loss in lung volume measured by spirometry. According to several studies, periodontal therapy may improve lung function by reducing the frequency of exacerbations, reducing the risk of adverse respiratory events, and reducing morbidity.

Keywords: Polymicrobial infectious ailments, Pulmonary diseases, Asthma.

Introduction

Gum disease, also known as periodontal disease, is characterised as a collection of polymicrobial infectious diseases (such as gingivitis and periodontitis) that impact the tissues that support the teeth [1]. Gingivitis, which is frequently brought on by bacteria and increased gum inflammation, can progress into periodontitis, which results in a build-up of plaque on the teeth that migrates towards the gum line and causes tooth loss and bone loss. Most adults have gingivitis or more severe periodontitis, both of which are mostly preventable with excellent oral hygiene practises like brushing, flossing, and regular visits to a dental care professional [2]. The most frequent reason for tooth loss is periodontal disease, which can also exacerbate systemic illnesses including pulmonary disease. Over the past few years, studies focusing on the connection between lung pathology and disorders of the oral health, such as pneumonia, chronic obstructive pulmonary disease, asthma, TB, covid-19, and bronchiectasis, has been more commonly documented. Importantly, spirometry lung volume loss over time is also linked to periodontal disease [3]. Lower respiratory infections caused about 2.7 million fatalities between 2005 and 2015 and pulmonary disorders are a significant cause of mortality and cost burden worldwide. Therefore, infections resulting from periodontal disease may be a factor in lung function reduction and even death.

Every area of our bodies is inhabited by microbes, which can be symbiotic, commensal, or harmful. A change in the

microbiome's natural flora could affect how diseases start and progress in our bodies' community of microbial residents. The second-largest and most varied microbial population in the body is found in the oral cavity [4]. The teeth, tongue, cheeks, gingival sulcus, tonsils, hard palate, and soft palate are just a few of the surfaces in the oral cavity where microorganisms can colonise.

The oral microbiome can be influenced by genetic and environmental factors, which directly affect periodontal disease. Smoking significantly contributes to the onset and progression of cancer, cardiovascular disease, chronic obstructive pulmonary disease, and periodontal disease. Cigarette smoke inhalation is one of the top risk factors for the global disease burden. Comparing persons with type 2 diabetes mellitus to non-diabetics, the incidence of periodontitis is around three times higher [5]. Additionally, type 1 diabetes mellitus increases the risk of developing periodontitis. According to an early study conducted in the 1980s, 10% of children (under 18 years old) with type 1 diabetes mellitus had increased bone and attachment loss but similar plaque scores.

We will quickly mention a few more complicating variables related with periodontitis below, such as age, stress, medication, tooth grinding, cardiovascular disease, rheumatoid arthritis, poor nutrition/diet, and others. According to certain data, periodontal debridement using hand or ultrasonic instruments doesn't seem to have any negative effects on individuals who already have COPD or the quality of their lives [6].

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There is indirect mechanistic evidence between pulmonary illnesses with periodontal disease. Low-grade systemic inflammation linked to periodontal disease may impair lung function. Adolescence is thought to be the starting point for the negative effects of oral inflammation on pulmonary function [7]. An underlying mechanism for lung and oral inflammatory processes may be the aspiration of microorganisms from the oral cavity. Periodontal pockets, which are holes or openings that surround the teeth below the gum line and are present in illness, can encourage the build-up of dental plaque, which can cause pathogenic bacteria to multiply and grow. Oral bacteria that enter the lower airways may cause pneumonia or exacerbate conditions like asthma, COPD, or bronchiectasis. The subsequent overproduction of cytokines and chemokines may worsen pulmonary reactions, including mucus production. In children with underlying asthma, routine dental care is associated with lowered lung function [8]. Colophony, a component of several fluoride varnishes is known to trigger allergic reactions in susceptible individuals, making it generally contraindicated in young patients with severe asthma.

Conclusion

Changes in the mouth cavity's flora are frequently seen in periodontal diseases and may have a role in the development of pulmonary complications in a number of illnesses. Oral interventional techniques generally seem to result in better pulmonary outcomes, although the danger of aspiration, particularly in the elderly population, may have an impact on exacerbations in patients with pulmonary comorbidities. Although we don't go into great detail here, the outcomes of the lung disease treatment may also have an impact on the oral cavity. Overall, further research is needed to understand how periodontal disorders affect pulmonary outcomes.

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