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ORIGINAL RESEARCH

Prevalence of periodontitis in patients with pulmonary disease

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ABSTRACT:
Background: The orthodontic biomechanics is based on the principle of elastic energy storage and its conversion into mechanical energy during the tooth movement. The bending testing, but only on aesthetic covered arch wires collected from patients with minor crowding, without any extractions of premolars treated with fixed devices. Hence; the present study was undertaken for evaluating the incidence and location of fracture in round orthodontic arch wires. **Materials & methods:** A total of 125 orthodontic patients (239 arch wires) were included in the present study. Evaluation of all the patients was done during the regular treatment visits. Assessment of fracture of arch wires and their location was done. Complete demographic and clinical details of all the patients were obtained. Details about type of arch wires, type of brackets and time period of treatment before fracture was recorded separately. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Overall incidence of arch wire failure was 4.8 percent. Majority of arch wire failure occurred in 0.014" archwire. Out of 6 cases of arch wire failure, 4 was present maxilla while the remaining 2 were present in mandible. While evaluating the incidence of arch wire failure in maxillary arch and mandibular arch, non-significant results were obtained. **Conclusion:** Incidence of arch wire fracture during regular orthodontic visits is significantly low.
Key words: Fracture, Archwire, Location

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INTRODUCTION

Periodontitis is one of the most prevalent human infections. The majority of adults suffer from some degree of periodontitis, with 15–20% of the adult population having severe periodontal disease[1-2]. Periodontitis is an oral bacterial infection that results in gingival inflammation, breakdown of the supporting connective tissue, pocket formation between the gingiva and the tooth, destruction of alveolar bone and eventually exfoliation of teeth. While probing depth reflects current disease status, clinical attachment loss (CAL) equals the reduction in the supporting connective tissue of the tooth and reflects cumulative disease experience[3].

Recently, more pieces of evidence have shown that a poor oral and periodontal condition is a potential risk factor for systemic diseases, strongly indicating the two-way interrelationship between oral and general systemic health[4-5]. For example, epidemiological and biological data indicate potential links between chronic periodontitis and systemic diseases, such as cardiovascular disease, diabetes, respiratory disease, rheumatoid arthritis, and adverse pregnancy outcomes[6-7].

A relationship between poor periodontal health and respiratory disease, especially in high-risk subjects, has been suggested by a number of recent microbiologic and epidemiologic studies. Several reports suggested that potential respiratory pathogens, which cause COPD, colonize the mouth of high-risk subjects; for example, those in intensive care unit [8] and nursing home residents[9]. Hence, the present study was undertaken to evaluate prevalence of periodontitis in patients with pulmonary disease.

MATERIAL AND METHOD

The purpose of this study was to evaluate prevalence of periodontitis in patients with pulmonary disease. This study was carried out in the Periodontics department of the dental college. A total of 120 patients were enrolled for this study. The study was carried out after obtained ethical clearance from the

ethical committee. The purpose of the study was explained to the patients and a written informed consent was obtained. The demographic details of the patients were obtained. A detailed questionnaire was prepared encompassing patients history, diagnosis, periodontal health and associated pulmonary conditions. The data was collected by a single investigator using a questionnaire, and clinical examination was done to record the periodontal disease by evaluating the plaque and calculus scores, pocket lesions and furcation involvement.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

RESULTS

In the current study it was observed that out of 40 patients with COPD, 12 patients had chronic periodontitis. The prevalence of chronic periodontitis amongst COPD patients was 30% (table 1). Graphic representation of the prevalence of chronic periodontitis amongst COPD patients was shown in graph 1.

The present study observed that out of 40 patients with Pneumonia, 10 patients had chronic periodontitis. The prevalence of chronic periodontitis amongst Pneumonia patients was 25% (table 1). Graphic representation of the prevalence of chronic periodontitis amongst Pneumonia patients was shown in graph 1.

Table 1: Correlation between chronic periodontitis and pulmonary diseases

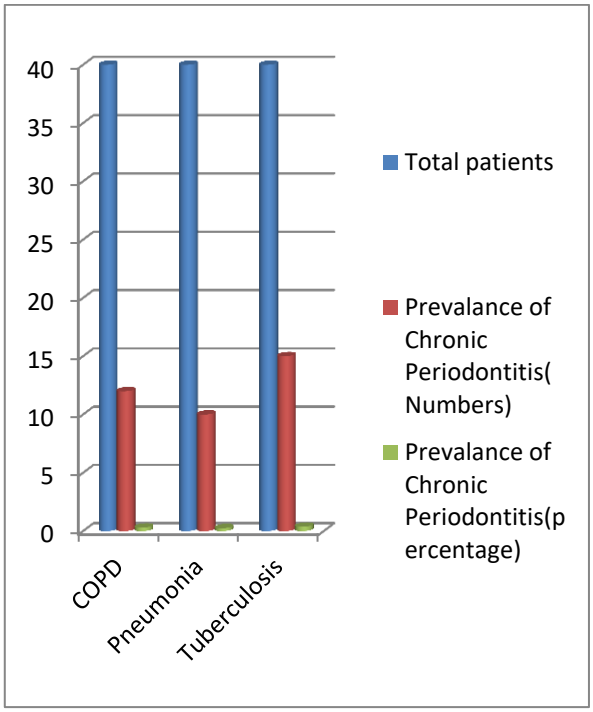
Variable	COPD	Pneumonia	Tuberculosis
Total patients	40	40	40
Prevalence of Chronic Periodontitis (Numbers)	12	10	15
Prevalence of Chronic Periodontitis (percentage)	30%	25%	37.5%

The present study observed that out of 40 patients with Tuberculosis, 15 patients had chronic periodontitis. The prevalence of chronic periodontitis amongst Tuberculosis patients was 37.5% (table 1). Graphic representation of the prevalence of chronic periodontitis amongst Tuberculosis patients was shown in graph 1.

DISCUSSION

Chronic obstructive pulmonary disease (COPD) is a generic term used to describe chronic lung diseases, including emphysema, chronic bronchitis, small airways disease, and non-reversible asthma[10]. It affects around 200 million people worldwide and is a major cause of morbidity and mortality[11]. COPD is characterized by airflow limitation that is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases. The main cause of COPD is smoking, and it is aggravated by exacerbations likely caused by bacterial and/or viral infections[12].

Graph 1: Graphical representation of correlation between chronic periodontitis and pulmonary diseases.



Periodontitis is one of the most prevalent human infections. The majority of adults suffer from some degree of periodontitis, with 15–20% of the adult population having severe periodontal disease[13-14]. Exacerbation and progression of COPD depend on the initial colonization of microbial pathogens to oral/pharyngeal surfaces. The pathogens are subsequently shed into the salivary secretions, together with oral bacteria and proinflammatory enzymes. Thus, the contents of this secretion may contaminate and induce alterations of the respiratory epithelium [15]. Oral bacteria may alter the environment of the upper airway to enhance the potential for respiratory pathogens colonization of the lower respiratory tract[16].

In the current study it was observed that out of 40 patients with COPD, 12 patients had chronic periodontitis. The prevalence of chronic periodontitis amongst COPD patients was 30% (table 1). Graphic representation of the prevalence of chronic periodontitis amongst COPD patients was shown in graph 1. Euni Lee et al evaluated the prevalence of periodontitis and to examine the association between reduced pulmonary function and periodontitis using Sixth Korea National Health and Nutrition Examination Survey (KNHANES) in 2014. A cross-

sectional evaluation was conducted to estimate the prevalence of periodontitis and to examine the association between periodontitis and reduced pulmonary function while adjusting for sociodemographic characteristics and current smoking status in survey participants between 40 and 79 years old. The presence of periodontitis was evaluated by community periodontal index defined by the World Health Organization, and the assessments of reduced pulmonary function data were made as "normal," "restrictive impairment," or "obstructive impairment." *Results*: A total of 4004 survey participants representing 25.4 million Koreans were included in the study. Overall, 41.1% of the study population were determined to have periodontitis, and 22.1% had reduced pulmonary function; 7.9% and 14.2% had restrictive- and obstructive- pulmonary impairments, respectively. Age, male gender, and current smoking status were positive predictors for periodontitis. Insurance coverage by workplace and higher education were protective factors against periodontitis. The association between periodontitis and restrictive impairment (adjusted odds ratio (OR) = 1.059, 95% CI 0.729–1.540) or obstructive impairment (adjusted OR = 1.140, 95% CI 0.849–1.530) was not significant. *Conclusions*: For Koreans, 40–79 years old, age, smoking status, gender, education, and insurance coverage were significant predictors of periodontitis. The prevalence of periodontitis was not significantly associated with reduced pulmonary function[17].

The present study observed that out of 40 patients with Pneumonia, 10 patients had chronic periodontitis. The prevalence of chronic periodontitis amongst Pneumonia patients was 25% (table 1). Graphic representation of the prevalence of chronic periodontitis amongst Pneumonia patients was shown in graph 1. Insha Shehri et al evaluated the prevalence of periodontitis in patients with pulmonary disease. The present study was conducted in the Department of Periodontics of the dental institutions. The ethical clearance for the study was approved from the ethical committee of the hospital. A total of 120 patients between age group of 12-70 years were selected from the outpatient department of pulmonary diseases. The data were collected by a single investigator using a questionnaire, and clinical examination was done to record the periodontal disease index (PDI) and periodontal index for risk of infectiousness (PIRI). In their study group, 59 male patients and 41 female patients were included. We observed that most common pulmonary disease in males was COPD. On the contrary, most common pulmonary disorder in females was TB. Among the whole study group, the highest number of patients had tuberculosis, followed by COPD. The periodontal infectiousness score was high for 51 patients, moderate for 31 patients and low for 18 patients. The highest number of high risk patients had TB (n=21) and COPD (n=17). Within the limitations of the present study, it can be concluded that patients with pulmonary disorders are under high-risk category for periodontal diseases. Keywords: periodontitis, pulmonary disease, COPD, dental plaque[18].

The present study observed that out of 40 patients with Tuberculosis, 15 patients had chronic periodontitis. The prevalence of chronic periodontitis amongst Tuberculosis patients was 37.5% (table 1). Graphic representation of the prevalence of chronic periodontitis amongst Tuberculosis patients was shown in graph 1. Vikas Deo et al undertook a study to evaluate potential association between respiratory diseases and periodontal health status and to co-relate the severity of periodontal disease with that of chronic obstructive pulmonary disease (COPD). 150 patients of COPD (test group) and 50 Patients without COPD (control group) were recruited for the study. Information regarding patient's demographic and socioeconomic status and lifestyle (history of smoking) were considered in the study. Patients with COPD were grouped into mild, moderate and severe category on the basis of Spirometry. Periodontal health was assessed by measuring probing pocket depth, Clinical Attachment Loss (CAL) and Oral Hygiene Index (OHI). The results showed that the subjects with COPD had significantly more mean CAL) and a higher mean OHI than those without COPD. The risk for COPD appeared to be significantly elevated when attachment loss was found to be severe. A trend was noted in that lung function appeared to diminish as the amount of attachment loss increased. On the basis of the observed results of the study it can be concluded that the risk for COPD appeared to be significantly elevated when attachment loss was found to be severe. It is conceivable that oral interventions that improve oral health status may prove to lower the severity of lung infection in susceptible populations[19].

CONCLUSION

From the above study the author concluded that patients with pulmonary disorders are under a greater risk of developing chronic periodontitis. Further studies are recommended.

REFERENCES

1. Demmer RT, Papapanou PN. Epidemiologic patterns of chronic and aggressive periodontitis. Periodontol 2000 2010; 53: 28–44.
2. Holtfreter B, Schwahn C, Biffar R, et al. Epidemiology of periodontal diseases in the Study of Health in Pomerania. J Clin Periodontol 2009; 36: 114–123.
3. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. Lancet 2005; 366: 1809–1820.
4. Dave S., Van Dyke T. The link between periodontal disease and cardiovascular disease is probably inflammation. Oral Dis. 2008;14:95–101. doi: 10.1111/j.1601-0825.2007.01438.x.
5. Papapanou P.N. Systemic effects of periodontitis: lessons learned from research on atherosclerotic vascular disease and adverse pregnancy outcomes. Int. Dent. J. 2015;65:283–291. doi: 10.1111/idj.12185.

6. Paju S., Scannapieco F. Oral biofilms, periodontitis, and pulmonary infections. Oral Dis. 2007;13:508–512. doi: 10.1111/j.1601-0825.2007.01410a.x.
7. Lalla E., Papapanou P.N. Diabetes mellitus and periodontitis: a tale of two common interrelated diseases. Nat. Rev. Endocrinol. 2011;7:738–748. doi: 10.1038/nrendo.2011.106.
8. Scannapieco FA, Stewart EM, Mylotte JM. Colonization of dental plaque by respiratory pathogens in medical intensive care patients. Crit Care Med 1992;20:740-5.
9. Russell SL, Boylan RJ, Kaslick RS, Scannapieco FA, Katz RV. Respiratory pathogen colonization of the dental plaque of institutionalized elders. Spec Care Dentist 1999;19:128-34.
10. Rabe K.F., Beghé B., Luppi F., Fabbri L.M. Update in Chronic Obstructive Pulmonary Disease 2006. Am. J. Respir. Crit. Care Med. 2007;175:1222–1232. doi: 10.1164/rccm.200704-586UP.
11. Lopez A.D., Mathers C.D., Ezzati M., Jamison D.T., Murray C.J. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. Lancet. 2006;367:1747–1757. doi: 10.1016/S0140-6736(06)68770-9.
12. Decramer M., Janssens W., Miravitlles M. Chronic obstructive pulmonary disease. Lancet. 2012;379:1341–1351. doi: 10.1016/S0140-6736(11)60968-9.
13. Demmer RT, Papapanou PN. Epidemiologic patterns of chronic and aggressive periodontitis. Periodontol 2000 2010; 53: 28–44.
14. Holtfreter B, Schwahn C, Biffar R, et al. Epidemiology of periodontal diseases in the Study of Health in Pomerania. J Clin Periodontol 2009; 36: 114–123.
15. Russell SL, Boylan RJ, Kaslick RS, Scannapieco FA, Katz RV. Respiratory pathogen colonization of the dental plaque of institutionalized elders. Spec Care Dentist 1999;19:128-34.
16. Scannapieco FA, Mylotte JM. Relationships between periodontal disease and bacterial pneumonia. J Periodontol 1996;67:1114-22.
17. Lee E, Lee SW. Prevalence of Periodontitis and its Association with Reduced Pulmonary Function: Results from the Korean National Health and Nutrition Examination Survey. Medicina (Kaunas). 2019;55(9):581. Published 2019 Sep 10. doi:10.3390/medicina55090581
18. Shehri I, Nissar S, Anis BA, Karuna, Singh S. Evaluation of prevalence of periodontitis in patients with pulmonary disease. J Adv Med Dent Scie Res 2020;8(6):70-71.
19. Deo V, Bhongade ML, Ansari S, Chavan RS. Periodontitis as a potential risk factor for chronic obstructive pulmonary disease: A retrospective study. Indian J Dent Res 2009;20:466-70