Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 91.86

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Assessment of relationship between oral health and COPD exacerbations

[1]Sameer Anand, [2]Nitin Kudyar, [3]Aashima Gupta

[1]Medical Officer, CHC Chenani, Udhampur, Jammu and Kashmir, India;
[2]Consultant, Dist. Hospital, Udhampur, Jammu and Kashmir, India;
[3]Reader, Himachal Dental College, Sundernagar, Himachal Pradesh, India

ABSTRACT:
Background: Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation of the bronchial tubes causing damage to the trachea and lung parenchyma and, consequently, a reduction in airflow. The present study was conducted to assess relationship between oral health and COPD exacerbations. **Materials & Methods:** 60 patients of asthma and COPD using inhaler of both genders were divided into 3 age groups: Group I-less than 25 years, Group II-25-50 years, and Group III-above 50 years. Oral lesion son tongue, buccal mucosa, periodontium were recorded. Xerostomia and teeth affected were also recorded. **Results:** Out 52 patients, males were 38 and females were 14. Global oral health status found to be poor in 21% and 30%, fair in 29% and 37%, good in 27% and 15%, very good in 7% and 10% and excellent in 6% and 8%. Oral symptoms showed loose teeth in 42% and 49%, bleeding gums in 30% and 34% and dry mouth in 69% and 51%. Severity of periodontitis was mild in 28% and 18%, moderate in 32% and 35% and severe in 40% and 47%. Caries assessment risk was low in 26% and 18%, moderate in 32% and 46% and high in 42% and 32% in COPD exacerbators and non- exacerbators respectively. The difference was significant (P< 0.05). **Conclusion:** It was found that oral health status was not related to COPD exacerbations.
Key words: caries, Chronic obstructive pulmonary disease, exacerbators

Received: 26 March, 2022 Accepted: 30 April, 2022

Corresponding author: Aashima Gupta, Reader, Himachal Dental College, Sundernagar, Himachal Pradesh, India

This article may be cited as: Anand S, Kudyar N, Gupta A. Assessment of relationship between oral health and COPD exacerbations. J Adv Med Dent Scie Res 2022;10(5):146-149.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation of the bronchial tubes causing damage to the trachea and lung parenchyma and, consequently, a reduction in airflow. Airflow is defined as the ratio of forced expiratory volume in 1 second (FEV_1) and forced vital capacity (FVC) by pulmonary function test (PFT), and is less than 70% in patients with COPD. COPD symptoms include chronic cough, expectoration, dyspnoea, worsening of pulmonary function, and eventually death.[1]

COPD exacerbations are a major cause of morbidity, seriously impair quality of life, and can result in irreversible loss of lung function.[2] A severe COPD exacerbation requiring hospitalization is associated with high mortality both in the hospital and after discharge. Prevention of COPD exacerbations is an important aspect of COPD management. Hence, exploration of risk factors and identification of patients who are susceptible to COPD exacerbations is needed.[3]

Periodontal disease and poor oral health have been associated with a number of systemic diseases, including COPD.It is well recognized that smoking is the primary risk factor for COPD but emerging evidence suggests that periodontitis is associated with increased risk of development of COPD. COPD and periodontitis share several risk factors such as age, smoking, stress and ethnicity.[4] The diseases also have similar pathophysiology, characterized by inflammation, recruitment of neutrophils and release of proteolytic enzymes, resulting in the destruction of the pulmonary alveolus or destruction of the periodontal tissues.[5]The present study was conducted to assess relationship between oral health and COPDexacerbations.

MATERIALS & METHODS

The present study comprised of 52 patients of COPD of both genders. All were informed regarding the

study and their written consent was obtained.COPD exacerbations were defined as taking antibiotics and/ or oral corticosteroids for respiratory symptoms, or hospitalization or emergency department visit for respiratory illness.
Data such as age, gender etc. was recorded. A thorough examination in all was performed. Oral examination was carried out. Global oral health status and caries risk assessment was performed. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant (P< 0.05).

RESULTS

Table I Distribution of patients

Total- 52		
Gender	**Males**	**Females**
Number	38	14

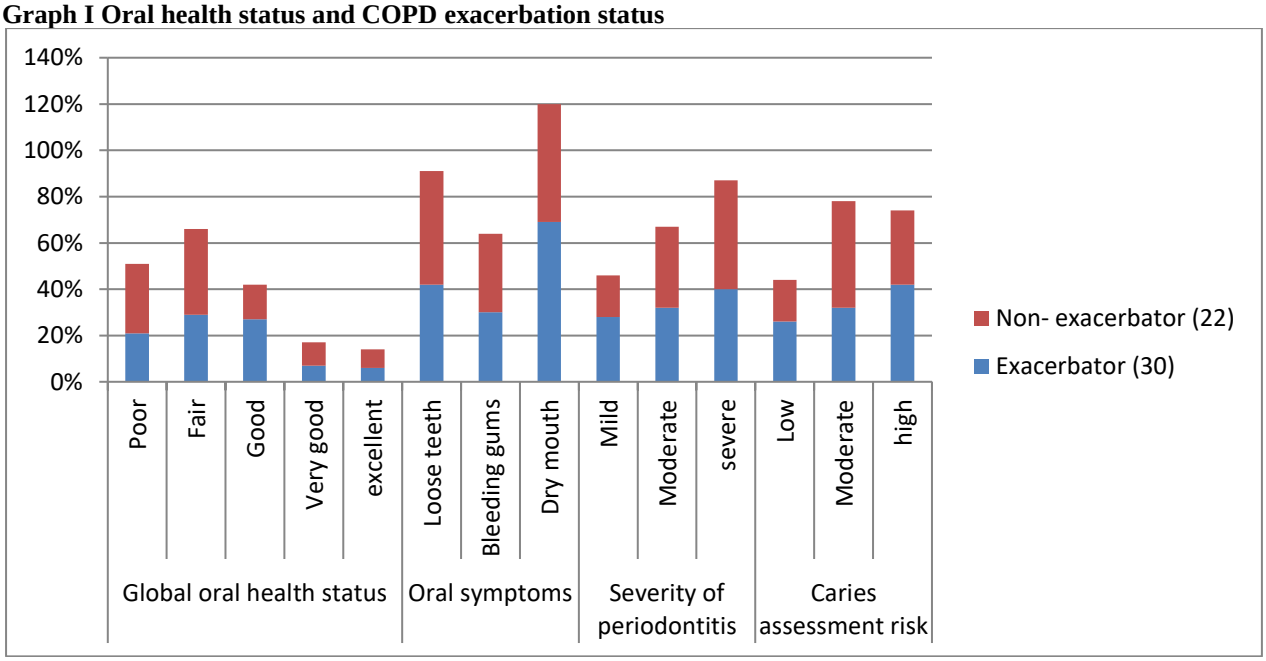
Table I shows that out of 52 patients, males were 38 and females were 14.

Table II Oral health status and COPD exacerbation status

Parameters	Variables	Exacerbator (30)	Non- exacerbator(22)	P value
Global oral health status	Poor	21%	30%	0.05
	Fair	29%	37%	
	Good	27%	15%	
	Very good	7%	10%	
	excellent	6%	8%	
Oral symptoms	Loose teeth	42%	49%	0.17
	Bleeding gums	30%	34%	
	Dry mouth	69%	51%	
Severity of periodontitis	Mild	28%	18%	0.14
	Moderate	32%	35%	
	severe	40%	47%	
Caries assessment risk	Low	26%	18%	0.21
	Moderate	32%	46%	
	high	42%	32%	

Table II, graph I shows that global oral health status found to be poor in 21% and 30%, fair in 29% and 37%, good in 27% and 15%, very good in 7% and 10% and excellent in 6% and 8%. Oral symptoms showed loose teeth in 42% and 49%, bleeding gums in 30% and 34% and dry mouth in 69% and 51%. Severity of periodontitis was mild in 28% and 18%, moderate in 32% and 35% and severe in 40% and 47%. Caries assessment risk was low in 26% and 18%, moderate in 32% and 46% and high in 42% and 32% in COPD exacerbators and non- exacerbators respectively. The difference was significant (P< 0.05).

Graph I Oral health status and COPD exacerbation status



DISCUSSION

Periodontitis is defined as a chronic multifactorial disease associated with dysbiotic plaque biofilms, characterised by loss of periodontal support, clinical attachment loss, gingival bleeding, periodontal pocketing and alveolar bone loss. Emerging evidence suggests oral bacteria and local inflammatory response in periodontal tissues contribute to systemic inflammation and increase the risk for development of chronic inflammatory conditions including diabetes, cardiovascular and respiratory disease.[6]Approximately 50% of COPD exacerbations are attributed to bacterial infections. Researchers have demonstrated increased microbial biomass and microbial diversity in COPD patients compared to healthy adults.[7,8] In addition, oral and nasal bacteria have been identified in the COPD lung tissue microbiota, suggesting aspiration of oral secretions as a major source of the COPD lung microbiota.[9,10]The present study was conducted to assess relationship between oral health and COPDexacerbations.

We found that out of 52 patients, males were 38 and females were 14. Baldomero et al[11] determined if poor oral health is associated with COPD exacerbations and/or worse respiratory health. They performed a case-control study of oral health among COPD exacerbators and non-exacerbators. Screened non-exacerbators (n=118) were significantly more likely to have <4 teeth, compared to screened exacerbators (n=100) (44% vs 30%, respectively; p=0.046). After excluding those with <4 teeth, there were 70 cases and 66 controls. Self-reported oral health and objective dental exam measures did not vary significantly between cases vs controls. However, the odds of severe COPD exacerbations requiring hospitalizations and/or emergency department visits trended higher in those with worse dental exam compared to those with better dental exam. Worse OHIP-5 was strongly associated with worse SGRQ scores.

We observed that global oral health status found to be poor in 21% and 30%, fair in 29% and 37%, good in 27% and 15%, very good in 7% and 10% and excellent in 6% and 8%. Oral symptoms showed loose teeth in 42% and 49%, bleeding gums in 30% and 34% and dry mouth in 69% and 51%. Severity of periodontitis was mild in 28% and 18%, moderate in 32% and 35% and severe in 40% and 47%. Caries assessment risk was low in 26% and 18%, moderate in 32% and 46% and high in 42% and 32% in COPD exacerbators and non- exacerbators respectively. Jung et al[12]elucidated the association between oral health status and chronic obstructive pulmonary disease (COPD) in Korean adults (≥ 40 years old) using a representative national dataset from the 6th Korea National Health and Nutrition Examination Survey (6th KNHANES, 2013–2015). Participants aged ≥ 40 years from the 6th KNHANES who had received an oral and pulmonary function tests (N = 7719) were included in this study. The participant characteristics according to COPD were compared using *t*-test and chi-squared test. Logistic regression analysis was used to estimate the association between oral health status and COPD. Participants with poor periodontal status exhibited a higher prevalence of COPD. Moreover, patients with COPD had a greater number of missing teeth than those without COPD. The logistic regression model adjusted for demographic, socioeconomic, health- and oral health-related factors showed that the periodontal status was not significantly associated with COPD, while participants with more missing teeth had a significantly increased possibility of having COPD.

Kelly et al analysed the association between poor periodontal status and the frequency of chronic obstructive pulmonary disease (COPD) exacerbations.Searches identified 532 records and 8 met the inclusion criteria. Data from observational studies suggest association of worse plaque scores and fewer teeth with exacerbation, but not pocket depth or clinical attachment loss. Better periodontal health was also associated with reduced frequency of COPD exacerbations, hospitalisations and improved quality of life in COPD patients. Due to the high heterogeneity no meta-analysis was performed. The quality of some of the included studies was low and there was evidence of a high risk of bias.

CONCLUSION

Authors found that oral health status was not related to COPD exacerbations.

REFERENCES

1. Barbosa VL, Angst PD, Finger Stadler A, Oppermann RV, Gomes SC. Clinical attachment loss: estimation by direct and indirect methods. Int Dent J. 2016;66(3):144–149.
2. Löe H. The gingival index, the plaque index and the retention index systems. J Periodontol. 1967;38(6 Suppl):610–616.
3. Turesky S, Gilmore ND, Glickman I. Reduced plaque formation by the chloromethyl analogue of victamine C. J Periodontol. 1970;41 (1):41–43.
4. Hoogendoorn M, Feenstra TL, Hoogenveen RT, Al M, Mölken MR. Association between lung function and exacerbation frequency in patients with COPD. Int J Chron Obstruct Pulmon Dis. 2010;5:435–444.
5. Donaldson GC, Wedzicha JA. COPD exacerbations 0.1: epidemiology. Thorax. 2006;61(2):164–168
6. Burgel PR, Nesme-Meyer P, Chanez P, et al. Cough and sputum production are associated with frequent exacerbations and hospitalizations in COPD subjects. Chest. 2009;135(4):975–982.
7. Wang Z, Zhou X, Zhang J, et al. Periodontal health, oral health behaviours, and chronic obstructive pulmonary disease. J Clin Periodontol. 2009;36(9):750–755.
8. Offenbacher S, Beck JD, Barros SP, Suruki RY, Loewy ZG. Obstructive airway disease and edentulism in the atherosclerosis risk in communities (ARIC) study. BMJ Open. 2012;2(6):e001615.

9. Barros SP, Suruki R, Loewy ZG, Beck JD, Offenbacher S. A cohort study of the impact of tooth loss and periodontal disease on respiratory events among COPD subjects: modulatory role of systemic biomarkers of inflammation. PLoS One. 2013;8(8):e68592.
10. Gaeckle NT, Heyman B, Criner AJ, Criner GJ. Markers of dental health correlate with daily respiratory symptoms in COPD. Chronic Obstr Pulm Dis. 2018;5(2):97–105.
11. Baldomero AK, Siddiqui M, Lo CY, Petersen A, Pragman AA, Connett JE, Kunisaki KM, Wendt CH. The relationship between oral health and COPD exacerbations. International Journal of Chronic Obstructive Pulmonary Disease. 2019;14:881.
12. Jung ES, Lee KH, Choi YY. Association between oral health status and chronic obstructive pulmonary disease in Korean adults. International Dental Journal. 2020 Jun 1;70(3):208-13.
13. Kelly N, Winning L, Irwin C, Lundy FT, Linden D, McGarvey L, Linden GJ, El Karim IA. Periodontal status and chronic obstructive pulmonary disease (COPD) exacerbations: a systematic review. BMC oral health. 2021 Dec;21(1):1-1.