Review Article

Prevalence of Periodontal Diseases in other Associated Diseases

Chanchal Katariya*
Saveetha Dental College & Hospital, Chennai, Tamil Nadu, India.
***Corresponding author's E-mail:** chanchalkatariya0@gmail.com

Accepted on: 20-04-2015; **Finalized on:** 30-06-2015.

ABSTRACT

Periodontal diseases, are a group of diseases which affects one or more of the periodontal tissues like alveolar bone, periodontal ligament, cementum and gingiva. Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health, leading to reduced life expectancy and/or increased health problems. Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels. Diabetes mellitus (DM), commonly referred to as diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. The recent studies have shown that the obesity, diabetes mellitus and cardiovascular diseases are the major cause for periodontal problems.

Keywords: Periodontal, disease, diabetis and obesity.

INTRODUCTION

Periodontal Diseases

"Peri" means around, and "odont" refers to teeth. Periodontal diseases are infections of the structures around the teeth. These include the gums, the cementum that covers the root, the periodontal ligament and the alveolar bone. In the earliest stage of periodontal disease, gingivitis, the infection affects only the gums. In more severe forms of the disease, all of the supporting tissues are involved.[1] Assessment of the global prevalence of periodontal diseases across different populations has been impacted by substantial variation in the clinical criteria, such as bleeding on probing, pocket depth, and degree of attachment loss used to define the presence and severity of periodontal disease among studies.[2]

Obesity

The definition of obesity is based on body mass index (BMI, also called Quetelet Index), which is the ratio of body weight in Kg to body height in m.[3] Obesity occurs when the size and number of fat cells in a person's body increase. A normal person has 30-35 billion fat cells. When a person gains weight, these fat cells first increase in size and later in number. The WHO defines obesity as abnormal or excessive fat accumulation that may impair health and classifies obesity as a chronic disease.[4]

Diabetes Mellitus

Diabetes mellitus (DM), commonly referred to as diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Diabetes is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced. There are three main types of diabetes mellitus: Type 1 DM results from the body's failure to produce enough insulin. This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes". The cause is unknown. Type 2 DM begins with insulin resistance, a condition in which cells fail to respond to insulin properly. As the disease progresses a lack of insulin may also develop. This form was previously referred to as "non insulin-dependent diabetes mellitus" (NIDDM) or "adult-onset diabetes". The primary cause is excessive body weight and not enough exercise. Gestational diabetes, is the third main form and occurs when pregnant women without a previous history of diabetes develop a high blood glucose level.[5]

Cardiovascular Disease

Cardiovascular disease (CVD) is a common cause of death, accounting for 29% of deaths worldwide. Estimates from the year 2002 show that more than 70 million Americans were diagnosed with one of the forms of CVD, which include high blood pressure, coronary heart disease (myocardial infarction and angina pectoris), peripheral arterial disease, and stroke, with atherosclerosis as the principal cause of all CVDs.[6] Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels.[1]

Common CVDs include: ischemic heart disease (IHD), stroke, hypertensive heart disease, rheumatic heart disease (RHD), aortic aneurysms, cardiomyopathy, atrial fibrillation, congenital heart disease, endocarditis, and peripheral artery disease (PAD), among others.[7]

DISCUSSION

Diabetes Mellitus

Harald Ioe they came to an conclusion that type 2 diabetes mellitus is the major cause for periodontal disease, no variation in the incidence of periodontal disease between male and female but the incidence of disease increased with age. Diabetic patients with

retinopathy had 5 times greater chance of having periodontal disease.[8] **(Dr. Kitti Torrungruang)** in their study suggested that age, gender, education, diabetes, oral hygiene status and smoking were all responsible for periodontal diseases.[9] **(Brian L. Mealey)** Inflammatory periodontal diseases may increase insulin resistance in a way similar to obesity, thereby aggravating glycemic control.[10] **(Carla C. Pontes Andersen)** By this experiment the authors concluded that not only diabetes patients but also pre diabetes patients can also have periodontitis.[11] **(Dragana Dakovic)** When compared to the children and adolescence without diabetes the patients with diabetes had more prominent peridontal diseases based on the duration of diseases, metabolic control and gingival inflammation.[12]

(uDina Garcia) Glycohaemoglobin and some associated factors are in deep relationship with periodontitis.[13] **(Rafael Paschoal Esteves Lima)** This study concluded that periodontitis is no way related to gestational diabetes mellitus.[14] **(Yukari Kajiura)** Glycated albumin showed a high level in gingival crevicular fluid in patients with diabetes mellitus.[15] **(Benito Sánchez-Domínguez DDS)** Patients with haemoglobin A1 levels of diabetes mellitus are associated with peri apical inflammation.[16]

(Rio de Janeiro) In this research they have proved that diabetes mellitus type 2 was the major cause of periodontal diseases.[17] **(Kenneth Izuoraet)** In this clinical trial they hypothesised that periodontal diseases with diabetes mellitus is associated with inadequate glycemic control and patients with more diabetes mellitus complication.[18] **(K. Zaman)** They carried out a clinical trial by measuring blood glucose level of diabetic patients and check the prevalence of periodontal diseases they came to a conclusion that type 2 diabetes mellitus is responsible for periodontal diseases.[19] **(Bernd Kowall)** Periodontitis and edentulism were associated with poorly controlled type 2 diabetes mellitus, but not with pre-diabetes and well controlled diabetes.[20]

Obesity

(Nelson wood) There was an arguments that periodontal disease and certain obesity-related systemic illnesses are related, with abnormal fat metabolism possibly being an important factor.[21] **(Mohammad S. Al-Zahrani)** Overall and abdominal obesity in younger individuals are more prone to periodontal diseases that underweight individuals.[22]

(Nobuko Nishida) Smoking and obesity are independent risk indicators for periodontitis.[23] (**Robert J. Genco)** Obesity is associated with high plasma levels of TNFα and its soluble receptors, which in turn may lead to a hyperinflammatory state increasing the risk for periodontal disease.[24] (**Yousef Saleh Khader)** Basal metabolic index-defined obesity, high waist circumference, and high fat per cent were significantly associated with increased odds of having periodontitis.[25] (**Benjamin W. Chaffee)** There is a positive relationship between obesity and periodontitis but there is no clear evidence.[26] (**Pelin Taşdelen Akman)** Serum PAI-1 levels may play an important role in the association between periodontal disease and obesity.[27] **(André Luiz Pataro)** Differences in periodontal condition were observed in individuals at different times of the bariatric surgery, showing a high prevalence of periodontitis in both preoperative and postoperative follow-up.[28] **(Takaaki tomofuji)** In overweight students, there is more consumption of fatty foods and less consumption of vegetables were associated with an increased risk of periodontitis. In underweight and normal-weight students, eating habits had very little effect on the periodontal condition.[29] **(Yiqiong Xie)** There is a positive association between pre pregnancy obesity and presence of periodontal diseases in pregnant females.[30] (**Aravind kumar P)** They stated that there is an association between the hyperlipedimia and negative influence on the pro inflammation on periodontal tissues.[31]

Cardiovascular Diseases

(Karen Geismar) This studied has shown that there is a posit e relation between periodontal diseases and coronary heart diseases. This is fully dependent on the age of the person and has close relation with diabetes and smoking.[32] (**Rachel A. Schallhorn)** There is significance role between periodontitis and interleukin 18 and CXC Ligand in patients undergoing coronary angiography.[33] (**Thomas Dietrich)** There is an increased risk of atherosclerotic cardiovascular disease with patients suffering from periodontal diseases when compared to patients without periodontal diseases.[34] **(Yau-Hua Y)** Patients with periodontal diseases may have high risk of getting cardiovascular diseases in future.[35]

CONCLUSION

The prevalence of periodontal disease is more prominent in patients with diabetics mellitus type II.

Incidence of rate of periodontal disease in men and women are equal.

Prevalence of periodontal diseases is also prominent in overall and abdominal obesity. It has seen to affect younger individual than the older individuals.

There is a positive relationship between cardiovascular disease and periodontal diseases.

Since there a positive relationship between periodontal disease and some systemic diseases, control of these systemic diseases and help us to maintain our oral hygiene.

REFERENCES

1. Periodontal diseases : causes and prevention/Columbia University college of dental medicine.
2. Periodontal Disease and Atherosclerotic Vascular Disease: Does the Evidence Support an Independent Association?/http://m.circ.ahajournals.org/content/125/20/2520.full

3. Sunitha Jagannathachary and Dinesh Kamaraj/Obesity and periodontal disease/Journal of Indian society of periodontology. 14(2), 2010Apr-jun, 96-100.
4. B Yadav, M Mittal, P Khanna, M Jain, S Kumar/Inter relationship between obesity and periodontal disease?/Internet journal of health /volume 13.
5. http://en.m.wikipedia.org/wiki/Diabetes_mellitus
6. Jemin Kim and Salomon Amar/Periodontal disease and systemic conditions: a bidirectional relationship/odontology. 94(1), 2006 Sep, 10-21.
7. http://en.m.wikipedia.org/wiki/Cardiovascular_disease
8. K. Zaman, M. Naser, M.H.A. Khan, S.H. Habib/Association of periodontal disease with lifestyle, diabetes mellitus and oral health care practices in an indigenous Bangladeshi population.
9. Dr. Kitti Torrungruang, Suphot Tamsailom, Kaesarin Rojanasomsith, Sanutm Sutdhibhisal, Kanokwan Nisapakultorn, Ornanong Vanichjakvong, Suvapa Prapakamol, Thirapat Premsirinirund, Thitima Pusiri, Orawan Jaratkulangkoon, Nongnuj Unkurapinun and Piyamitr Sritara/Risk Indicators of Periodontal Disease in Older Thai Adults/Journal of Periodontology, 76(4), April 2005, 558-565, DOI 10.1902/jop.2005.76.4.558
10. Brian L. Mealey* and Thomas W. Oates/Diabetes Mellitus and Periodontal Diseases/Journal of Periodontology, 77(8), August 2006, 1289-1303, DOI 10.1902/jop.2006.050459
11. Carla C. Pontes Andersen, Allan Flyvbjerg,† Karsten Buschard,‡ and Palle Holmstrup/Rela onship Between Periodontitis and Diabetes: Lessons From Rodent Studies/Journal of periodontology, 78(7), 2007, 1264-1275, DOI 10.1902/jop.2007.060491 (doi:10.1902/jop.2007.060491)
12. Dragana Dakovic and Milos D. Pavlovic†/Periodontal Disease in Children and Adolescents With Type 1 Diabetes in Serbia/Journal of Periodontology, 79(6), June 2008, Pages 987-992, DOI 10.1902/jop.2008.070549 (doi:10.1902/jop.2008.070549)
13. Dina Garcia, Sergey Tarima, and Christopher Okunseri/April 2015, Vol. 86, No. 4, DOI 10.1902/jop.2014.140364 /Periodontitis and Glycemic Control in Diabetes: NHANES 2009 to 2012/Journal of periodontology
14. Rafael Paschoal Esteves Lima, Luís Otávio Miranda Cota, and Fernando Oliveira Costa/Association Between Periodontitis and Gestational Diabetes Mellitus: A Case-Control Study/Journal of Periodontology, 84(9), September 2013, Pages 1257-1265, DOI 10.1902/jop.2012.120350 (doi:10.1902/jop.2012.120350)
15. Yukari Kajiura, Mika Bando, Yuji Inagaki, Toshihiko Nagata and Jun-ichi Kido/Glycated Albumin and Calprotectin Levels in Gingival Crevicular Fluid From Patients With Periodontitis and Type 2 Diabetes/Journal of periodontology, 85(12), December 2014, Pages 1667-1675, DOI 10.1902/jop.2014.140241 (doi:10.1902/jop.2014.140241)
16. Benito Sánchez-Domínguez DDS José López-López MD, DDS, PhDEnric Jané-Salas MD, DDS, PhD Lizett Castellanos-Cosano DDS, PhD Eugenio Velasco-Ortega MD, DDS, PhD Juan José Segura-Egea MD, PhD, DDS/Glycated Hemoglobin Levels and Prevalence of Apical Periodontitis in Type 2 Diabetic Patients/Journal of Endodontics, 41(5), May 2015, 601–606, doi:10.1016/j.joen.2014.12.024
17. Rio do Janerio/diabetes mellitus and periodontal diseases/Journal of Periodontal Research
18. Kenneth Izuora, Echezona Ezeanolue Karen Schlauch Michael Neubauer Civon Gewelber Guillermo Umpierrez/Impact of periodontal disease on outcomes in diabetes/Contemporary Clinical Trials, 41, March 2015, 93–99, doi:10.1016/j.cct.2015.01.011
19. K. Zaman, M. Naser, M.H.A. Khan, S.H. Habib/Association of periodontal disease with lifestyle, diabetes mellitus and oral health care practices in an indigenous Bangladeshi population/Journal of Diabetology, February 2015, 1-5.
20. Bernd Kowall, Birte Holtfreter, Henry Völzke, Sabine Schipf, Torsten Mundt, Wolfgang Rathmann and Thomas Kocher/Prediabetes and well controlled diabetes are not associated with periodontal disease: the SHIP Trend Study/Journal of clinical periodontology/27 April 2015.
21. Nelson Wood, Roger B. Johnson and Charles F. Streckfus./Comparison of body composition and periodontal disease using nutritional assessment techniques: Third National Health and Nutrition Examination Survey (NHANES III)/Journal of clinical periodontology/14 April 2013.
22. Mohammad S. Al-Zahrani, Nabil F. Bassada, Dr. Elaine A. Borawski/Obesity and Periodontal Disease in Young, Middle-Aged, and Older persons/Journal of periodontology, 74(5), May 2003, 610-615, DOI 10.1902/jop.2003.74.5.610 (doi:10.1902/jop.2003.74.5.610)
23. Nobuko Nishida, Muneo Tanaka, Naoji Hayashi, Hideki Nagata, Tatsuya Takeshita, Kunio Nakayama, Kanehisa Morimoto and Dr. Satoshi Shizukuishi/Determination of Smoking and Obesity as Periodontitis Risks Using the Classification and Regression Tree Method/Journal of Periodontology, 76(6), June 2005, 923-928, DOI 10.1902/jop.2005.76.6.923
24. Robert J. Genco,† Sara G. Grossi,† Alex Ho,† Fusanori Nishimura,‡ and Yoji Murayama§/A Proposed Model Linking Inflammation to Obesity, Diabetes, and Periodontal Infections/Journal of Periodontology, 76(11-s), November 2005, 2075-2084, DOI 10.1902/jop.2005.76.11-S.2075
25. Yousef Saleh Khader, Hiba Ahmad Bawadi, Touleen Fawzi Haroun, Mosa Alomari and Reema Fayez Tayyem/The association between periodontal disease and obesity among adults in Jordan/journal of periodontology First published: 24 November 2008 Full publication history DOI: 10.1111/j.1600-051X.2008.01345.xView/save citation
26. Association Between Chronic Periodontal Disease and Obesity: A Systematic Review and Meta-Analysis/ Benjamin W. Chaffee and Scott J. Weston†/Journal of periodontology, 81(12), December 2010, 1708-1724, DOI 10.1902/jop.2010.100321 (doi:10.1902/jop.2010.100321)
27. Pelin Taşdelen Akman, Özlem Fentoğlu,† Gülin Yılmaz,† and Nejat Arpak‡/Serum Plasminogen Activator Inhibitor-1 and Tumor Necrosis Factor-α Levels in Obesity and Periodontal Disease/Journal of Periodontology, 81(12), December 2010, 1708-1724, DOI 10.1902/jop.2010.100321

28. I André Luiz Pataro, Fernando Oliveira Costa, Sheila Cavalca Cortelli,† José Roberto Cortelli,† Ana Carolina Dupim Souza, Mauro Henrique Nogueira Guimarães Abreu, ‡Marcelo Gomes Girundi,§ and José Eustáquio Costa/Influence of Obesity and Bariatric Surgery on the Periodontal Condition/Journal of Periodontology, 83(3), March 2012, 257-266, DOI 10.1902/jop.2011.100782

29. Takaaki Tomofuji, Michiko Furuta,† Daisuke Ekuni, Koichiro Irie, Tetsuji Azuma, Yoshiaki Iwasaki,‡ and Manabu Morita/relationships Between Eating Habits and Periodontal Condition in University Students/Journal of Periodontology, 82(12), December 2011, 1642-1649, DOI 10.1902/jop.2011.110061

30. Yiqiong Xie, Xu Xiong, Karen E. Elkind-Hirsch,† Gabriella Pridjian,‡ Pooja Maney,§ Robert L. Delarosa, and Pierre Buekens/Prepregnancy Obesity and Periodontitis Among Pregnant Females With and Without Gestational Diabetes Mellitus/Journal of periodontology, 85(7), July 2014, 890-898, DOI 10.1902/jop.2013.130502 (doi:10.1902/jop.2013.130502)

31. Aravind Kumar P, Mohan Kumar P, Krishna Rao A, Krishna Dileep G/Periodontal disease and obesity/Journal of Periodontology, 2011, 16.

32. Karen Geismar, Kaj Stoltze, Bjarne Sigurd,† Finn Gyntelberg,‡ and Palle Holmstrup/Periodontal Disease and Coronary Heart Disease/Journal of Periodontology, 77(9), September 2006, 1547-1554, DOI 10.1902/jop.2006.050405

33. Rachel A. Schallhorn, Devang N. Patel,† Bysani Chandrasekar,‡§ and Brian L. Mealey/Periodontal Disease in Association With Systemic Levels of Interleukin-18 and CXC Ligand 16 in Patients Undergoing Cardiac Catheterization/Journal of Periodontology, 81(8), August 2010, 1180-1186, DOI 10.1902/jop.2010.100046

34. Thomas Dietrich, Praveen Sharma, Clemens Walter, Paul Weston and James Beck/The epidemiological evidence behind the association between periodontitis and incident atherosclerotic cardiovascular disease/Journal of periodontology, 30 April 2013DOI: 10.1111/jcpe.12062

35. Yau-Hua Yu, Daniel I. Chasman, Julie E. Buring, Lynda Rose and Paul M Ridker/Cardiovascular risks associated with incident and prevalent periodontal disease/Journal of Clinical Periodontology/9 January 2015.

Source of Support: Nil, **Conflict of Interest:** None.