Significant of Antibiotic prophylaxis for diabetic patients with periodontal disease, 1 hour before phase 1 periodontal therapy

Puja shrestha¹, *Md. Ashif Iqbal², Orin Chowdhury Bristy³, Nimesh shrestha⁴

ABSTRACT

People with diabetes are more likely to have periodontal diseases than people without diabetes. Periodontal disease is often considered a complication of diabetes. On the other hand, severe periodontal disease can increase blood glucose levels. Special care and management protocol need to be addressed to patients with diabetes during periodontal therapy. Systemic antibiotics in conjunction with scaling and root planning can offer an additional benefit over SRP alone in the treatment of periodontitis. This review aims to evaluate the significance of antibiotic prophylaxis for diabetic patients with the periodontal disease before 1 hour/ 1-2 days of phase 1 periodontal therapy. The goal of antibiotic prophylaxis is to prevent the onset of injections through the entranecway provided by the therapeutic action. But currently, no established guidelines are in place for antibiotic prophylaxis before periodontal therapy.

KEYWORDS: Antibiotic prophylaxis, Diabetic patient, Periodontal disease, Phase 1 therapy

INTRODUCTION

Diabetes Mellitus is a metabolic disease characterized by a change in carbohydrate, lipid and protein metabolism featuring increased blood glucose levels, resulting from either a defect in insulin secretion from the pancreas, changing insulin action or both.¹ The periodontal disease most commonly plaque-induced gingivitis and CP-gingivitis is defined as a group of conditions affecting the supporting structure of tooth which may consequence to loosening of teeth if untreated.² As enlisting the complication of DM, periodontitis has been recognized as the sixth one³ indicating the bidirectional links between DM and CP.¹ Both diabetes and periodontitis are chronic diseases with decreased collagen turnover, impaired neutrophil function, and increased periodontal destruction, diabetes adversely affects the periodontium. On the other hand, the release of pro-inflammatory cytokines from the inflamed periodontal tissue resulting from bacteria and bacterial products such as lipopolysaccharide from the subgingival plaque. When entering circulation and interfere with insulin signaling and causing insulin antagonism and pancreatic beta-cell destruction. plaque. When entering circulation and interfere with insulin signaling and causing insulin antagonism and pancreatic beta-cell destruction.¹ Biofilms, microbial cells encased within a matrix of extracellular polymeric substance and their active by-products are the main etiological factors for gingival and periodontal diseases.³ The most commonly involved species are porphyromonas gingivalis, treponema denticola and tannerella forsythia. Antibiotics play a vital role in eliminating these pathogenic bacteria.⁴ Numerous antibiotics could be employed but it is unclear with which antibiotic and when for the beneficial of
the patient. The discussion is concerned with antibiotic therapy in Diabetic patients.

MATERIAL AND METHODS

This narrative review article was conducted following the guidance of the periodontology and oral pathology department, Update Dental College. **Focused Question:** “As the defense system remains suppressed in DM do we have to give antibiotic prophylaxis before Phase-1 periodontal therapy?”

**Inclusion Criteria:** To be included in the sample, the journals/articles had to be an article within the last 10 years, a study that included prophylaxis antibiotic therapy and disease periodontitis along with DM. **Exclusion Criteria:** Studies related to another dental disease rather than periodontitis, articles published before a decade ago and which doesn’t include antimicrobial therapy were excluded.

**Search Strategy:** The articles from Pub med, hinar access of UPDC and Cochrane Central library of the review were searched up to November 2019 by two researchers using the keywords. “Prophylaxis antibiotic” “periodontitis” “Diabetes Mellitus” In doing so, we found 24 articles from Pub Med and from Cochrane Central Library. 1-24. **Data Extraction:** Among these identified articles, only five articles met the inclusion criteria after reading the abstract of individual articles first.1-5

**DISCUSSION**

The foci of this study were to arbitrate whether antibiotic prophylaxis is mandatory or not during phase 1 therapy in patients with periodontitis associated with diabetes mellitus. The results in the current study demonstrated that up until today, only two studies in the literature show the necessity of antibiotic prophylaxis during phase 1 therapy in either controlled or uncontrolled diabetes mellitus patients. This study is published by Anoop Kapor(2012 Sep-Oct) mentioned that in patients with diabetes, periodontal procedures such as probing, scaling, root planning, subgingival placement of antibiotic fibers or strip, periodontal surgery are considered as high-risk procedures.6

Also study from Gutierrez JL mentioned all the dental procedures that induce bleeding will develop transitory bacteremia that will rarely persist more than 15 minutes which has been confirmed by blood cultures. And in patients with DM, the primary and secondary immune system remains suppressed. Thus use of antibiotic prophylaxis during phase 1 periodontal therapy in patients with DM, reduce the prevalence of infection.5

Whereas, others stated that adjunctive use of systematic antibiotics is accentuated to support the host defense mechanism in defense of the pathogenic microorganisms.

**CONCLUSION**

We conclude that very few authentic sources mentioned that prophylaxis should be given to the patients with DM during or before phase 1 periodontal therapy and excluding that none of the articles has specified the use of antibiotic prophylaxis during scaling and root planning. Hence, with more advanced methods of studies and research, they should urge to reach a particular conclusion.

**REFERENCES:**

1. Grover HS, Luthra S. Molecular mechanisms involved in the bidirectional relationship between diabetes mellitus and periodontal disease. J Indian Soc Periodontol. 2013 May-Jun; 17(3): 292-301. https://doi.org/10.4103/0972-124X.115642 PMid:24049328 PMCid:PMC3768178

2. Sima C, Dyke TEV. Therapeutic Targets for Management of Periodontitis and Diabetes. Current Pharmaceutical Design, 2016, 22, 2216-2237 https://doi.org/10.2174/138161282266160216150338 PMid:26881443

3. Kapoor A, Malhotra R, Grover V, Grover D. Systemic antibiotic therapy in periodontics. Dent Res J (Isfahan). 2012 Sep-Oct; 9(5): 505-515 https://doi.org/10.4103/1735-3327.104866 PMid:23559912 PMCid:PMC36612184

4. Saqib SA, AlQahtani NA, Ahmed I, Kader MA, Shahrani SSA, Asiri EA. Evaluation and Comparison of Antibacterial Efficacy of Herbal Extracts in Combination with Antibiotics on Periodontal pathogens: An in vitro Microbiological Study. Antibiotics 2019, 8, 89 https://doi.org/10.3390/antibiotics8030089 PMid:31266146 PMCid:PMC6783985

5. Gutierrez JL, bagan JV, Bascones A, Llamas R, Llena J, Morales A, Noguero B, Planells P, Prieto J, Salmeron JJ. Consensus Document on the use of Antibiotic Prophylaxis in Dental Surgery and Procedures, Advances in Odontostomatologia. Vol 22; Num 1;2006 https://doi.org/10.4321/S0213-12852006000100005

6. Ebersole JL, Dawson III DR, Morford LA, Peyyala R, Miller CS, and Gonzalez OA. Periodontal disease immunology: ’double indemnity’ in protecting the host. NIH Public Access Author Manuscript 201; 62(1):163-202. doi:10.1111/prd.12005 PMid:23574466 PMCid:PMC4131201

7. Harks I, Koch R, Eickholz P, Hoffmann T, Kim T-S, Kocher T, Meyle J, Kaner D, Schlagenhauf S, Doering S, Hortofreter B, Gravemeier M, Hamoen D, Ehime B. Is progression of periodontitis relevantly influenced by systemic antibiotics? A clinical randomized trial. J Clin Periodontol 2015; 42: 832-842. doi:10.1111/jcpe.12441 https://doi.org/10.1111/jcpe.12441 PMid:26250506 PMCid:PMC5054899

8. C Ramu*, TV Padmanabhan. Indications of antibiotic prophylaxis in dental practice- Review. Asian Pacific Journal of Tropical Biomedicine 2012; 2(9): 749-754 https://doi.org/10.1016/S2221-1691(12)60222-6

9. Chatzopoulos GS, Doufee AE, Kouvatzi A. Clinical response to nonsurgical periodontal treatment in patients with interleukin-6 and interleukin-10 polymorphisms. Med Oral Patol Oral Cir Bucal 2017 Jul 1;22(4):e446-57 https://doi.org/10.4317/medoral.21795 PMid:28624837 PMCid:PMC5549518

10. Indurkar MS, Maurya AS, and Indurkar S. Oral Manifestations of Diabetes. CLINICAL.DIABETESJOURNALS.ORG 2016; 34(1):e54-57 https://doi.org/10.2337/diabclin.34.1.54 PMid:26807010 PMCid:PMC4714722

11. Rees TD. Periodontal management of the patient with diabetes mellitus. Periodontology 2000, Vol. 23, 2000, 63-72 https://doi.org/10.1034/j.1600-0757.2000.2230105.x PMid:11276766

12. Sundar C, Ramalingam S, Mohan V, Pradeepa R, and Ramakrishnan MJ. Periodontal therapy as an adjunctive modality for HbA1c reduction in type-2 diabetic patients. J Educ Health Promot. 2018; 7: 152. doi: 10.4103/jehp.jehp_66_18

Website: https://www.banglajol.info/index.php/UpDCJ
13. Cao R, Li Q, Wu Q, Yao M, Chen Y and Zhou H. Effect of non-surgical periodontal therapy on glycemic control of type 2 diabetes mellitus: a systematic review and Bayesian network meta-analysis. Cao et al. BMC Oral Health 2019;19:176 1-14. https://doi.org/10.1186/s12903-019-0829-v. PMid:31387569 PMCid:PMC6685286

14. Barça E, Çifcibaşı E, ÇınTa S. ADJUNCTIVE USE OF ANTIBIOTICS IN PERIODONTAL THERAPY. J Istanbul Univ Fac Dent 2015;49(3):55-62. https://doi.org/10.7096/jufd.9014. PMid:28955547 PMCid:PMC5573506

15. Skurska A, Dolinska E, Pietruska M, Pietruski J, Dymicka V, Kemenoa H, Arweiler NB, Milewski R and Scalean A. Effect of nonsurgical periodontal treatment in conjunction with either systemic administration of amoxicillin and metronidazole or additional photodynamic therapy on the concentration of matrix metalloproteinases 8 and 9 in gingival crevicular fluid in patients with aggressive periodontitis. Skurska et al. BMC Oral Health (2015) 15:63 DOI 10.1186/s12903-015-0048-0. https://doi.org/10.1186/s12903-015-0048-0. PMid:26007680 PMCid:PMC450832

16. Chen J, Chen Q, Hu B, Wang Y, Song J. Effectiveness of alendronate as an adjunct to scaling and root planing in the treatment of periodontitis: a meta-analysis of randomized controlled clinical trials. J Periodontal Implant Sci. 2016 Dec;46(6):382-395. https://doi.org/10.1111/j.1749-6632.2011.06460.x. PMid:22409777 PMCid:PMC3429365

17. Albert DA, Warda, Allweiss P, Graves DT, Knowler WC, Kunzel C, Leibel RL, Novak KF, Oates TW, Papapanou PN, Schmidt AM, Taylor1 GW, Lamster IB, and Lalla E. Diabetes and oral disease: implications for health professionals. Ann N Y Acad Sci. 2012 May; 1255: 1-15. doi:10.1111/j.1749-6632.2011.06460.x. https://doi.org/10.1111/j.1749-6632.2011.06460.x

18. Losada FDLP, Salas EJ, Recolons MDMS, Devesa AE2, Egea JJS, López JL. Correlation between periodontal disease management and metabolic control of type 2 diabetes mellitus. A systematic literature review. Med Oral Patol Oral Cir Bucal. 2016 Jul 1;21 (4):e440-6

19. Cervino G, Ciccio M, Bioni A, Bocchieri S, Herford AS, Laino L and Fiorillo L. Antibiotic Prophylaxis on Third Molar Extraction: Systematic Review of Recent Data. Antibiotics 2019,8, 53:1-14. https://doi.org/10.3390/antibiotics8020053. PMid:31052566 PMCid:PMC6677276

20. Pumerantz AS, Bissett SM, Dong F, Ochoa C, Wassall RR, Davila H, Barbee M, Nguyen J, Vila P, Preshaw PM. Standardized screening for periodontitis as an integral part of multidisciplinary management of adults with type 2 diabetes: an observational cross-sectional study of cohorts in the USA and UK. BMJ Open Diab Res Care 2017;5:e000413. doi:10.1136/bmjdr-2017-000413. https://doi.org/10.1136/bmjdr-2017-000413

21. Gurav AN. Management of diaboletic diabetes mellitus and periodontitis nexus: Are we doing enough?. World J Diabetes 2016 February 25; 7(4): 50-66. https://doi.org/10.4239/wid.v7i4.50. PMid:26962409 PMCid:PMC4766246

22. Um YJ, Jung UW, Kim CS, Bak EJ, Cha JH, Yoo YJ, Choi SH. The influence of diabetes mellitus on periodontal tissues: a pilot study. J Periodontal Implant Sci 2010;40:49-55 doi: 10.5051/jpis.2010.40.2.49. https://doi.org/10.5051/jpis.2010.40.2.49. PMid:20498760 PMCid:PMC2872813

23. Suda KJ, Calip GS, Zhou J, Rowan S, Gross AE, Hershoc RC, Perez RI, McGregor JC, and Evans CT. Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures, 2011 to 2015. JAMA Netw Open. 2019 May; 2(5): e193909. https://doi.org/10.1001/jamanetworkopen.2019.3909. PMid:31150071 PMCid:PMC6547109

24. Hong M, Kim HY, Seok H, Yeo CD, Kim YS, Song JY, Lee YB, Lee DH, Lee JI, Lee TK, Ahn HS, Ko YH, Jeong SC, Chae HS, and Sohn TS. Prevalence and risk factors of periodontitis among adults with or without diabetes mellitus. Korean J Intern Med 2016;31:910-919. https://doi.org/10.3904/kim.2016.091. PMid:27604799 PMCid:PMC5016291