

Short communication: Diabetes and its implication in periodontics

Author(s): Dr. Saima Yunus Khan

Vol. 20, No. 2 (2009-05 - 2009-08)

Biomedical Research 2009; 20 (2): 87-88

ISSN: 0970938X

Dr. Saima Yunus Khan

Saraswati Dental College, Lucknow, India

Abstract

There exists a definite relationship between diseases of oral cavity especially periodontal infections and systemic diseases. This article discusses the clinical implication of diabetes in periodontics.

Key words: Diabetes, Periodontium, Oral cavity

Accepted March 23 2009

Introduction

Periodontal diseases usually cause tooth loss among adults. These diseases are associated with polymicrobial infections which stimulate inflammatory response in periodontal tissues that result in loss of support of the affected teeth. Most studies indicate that the host response, rather than the direct effect of bacteria is responsible for the process. [2, 3]. Bacteria or their products have indirect role in stimulating inflammation which is associated with inflammatory mediators such as prostaglandins, TNF α or interleukin [2]. These mediators in turn induce the production and activation of enzymes that destroy gingival connective tissues and stimulate osteoclasts to cause bone resorption.

It is estimated that several million individuals in India have diabetes. Studies have shown that both type I and type II diabetes increase the risk of periodontal diseases and cause severe periodontal breakdown [4, 5]

Effects of Diabetes Mellitus on Periodontal Tissues:

Diabetes increases two- to five-fold likelihood of developing periodontal diseases [4, 5]. Several mechanisms have been proposed to explain the greater incidence and severity of periodontal disease in diabetes. In chronic diabetes, the basement membrane of small

vessels thicken as a result of non enzymatic glycosylation of extra vascular matrix components and intracellular proteins. A subsequent accumulation of deposits, known as advanced glycosylation end products (AGE's), occurs in the vessel walls and on the luminal surface. This may narrow the vessel lumen subsequently interfering with the transport across the vessel walls imparting oxidative stress on the periodontal tissues and hence prolong the inflammation [6].

Diabetes tends to increase susceptibility to bacterial infection by decreasing the effectiveness of cells that kill bacteria [7]. Every cell of the body except eyes are replaced at its own rate i.e. there exists equilibrium between formation and degradation. In diabetic patients there is an alteration in collagen metabolism due to increased activity of collagenase enzyme and hence more destruction [8]. There are also enhanced levels of AGE's which makes collagen less likely to be replaced or repaired.

Another possibility is that inflammation tends to be enhanced in those with diabetes. The resulting higher levels of pro-inflammatory cytokines such as IL-1 and TNF α may lead to an increase in bone loss. Moreover, the enhancement of net periodontal bone loss in diabetes may possibly be due to its negative impact on the formation of new bone.

Discussion

It has been repeatedly shown that the risk of periodontal disease is greatly influenced by diabetes, because diabetes has a significant impact on the bone in periodontal diseases. People with this disease need a thorough periodontal evaluation and a special consideration in treatment planning. Treatment of diabetes often reduces the risk of more severe periodontal diseases [10]. It has been reported that effective periodontal treatment helps in the stabilization of serum glucose levels [11]. The commonest periodontal feature in diabetes is increased attachment loss, apical migration of epithelial attachment, formation of periodontal pockets and multiple gingival and periodontal abscesses. It has also been reported that in diabetes, bacterial infection causes an enhanced net bone loss [13]. Khan

As a part of coupling process, growth and remodeling of the bone automatically recur after bone resorption. However, in diabetes prolonged and higher rate of osteoblast apoptosis is evident. Therefore, an increased loss of osteoblasts may possibly contribute to the diminished capacity of diabetics to form new bone after periodontal infection.

Conclusion

Diabetes has been considered as an important risk factor for periodontitis. Diabetes is found to increase the risk of developing periodontal disease about three-fold. However, the actual cause of which is not known. Diabetic patients, therefore require utmost care, attention and timely intervention to prevent progression of periodontal disease.

References

1. Williams R. Periodontal disease N Engl J Med 1990; 322: 373-382.
2. Teng YT. The role of acquired immunity and periodontal progression. Crit Rev Oral Perio Med. 2002; 13:132-142.
3. Schou S, Molmstrup P, Kornman KS. Non human primates used in studies of periodontal disease pathogenesis. A review of literature. J Periodontal 1993; 64: 497.
4. Loc H. Periodontal disease. The sixth complication of diabetes mellitus. Diabetes care 1993; 16: 329-334.
5. Ryan MF, Carna A, Kumer A. The influence of diabetes on the periodontal tissues. Amer Dent Assoc J. 2003; 134: 345-405.
6. Page RC, Beck J. Risk assessment for periodontal diseases. Int Dent J 1997; 47(2): 61-87.
7. Mowat A, Baum J. Chemotaxis of polymorpho nuclear leukocytes from patients with diabetes mellitus. N Engl J Med 1971; 284: 621-627.
8. Nalmas S, Mehta DS. Diabetes mellitus: A systemic modifier in periodontal disease. Journal of Indian Society of Periodontology 1999; 2: 48-52.
9. Salvi GE., Yalda B, Collous JG, et al. Inflamm. Mediator response as a potential risk master for periodontal disease in insulin dependent diabetes mellitus patients. J. Periodontal 1997; 68: 127-135.
10. Mattson JS, Cerutis DR. Diabetes mellitus. A review of literature and dental implications. Compend Contin Edu Dent 2001; 22: 757-760.
11. Mealey DL, Rethmans MP. Periodontal disease and diabetes mellitus. Bidirectional relationship. Dent. Today. 2003; 22: 107-113.
12. Schroedor HE, Listgarten MA. The gingival tissues: the architecture of periodontal protection. Periodontal 2000; 13: 91-120.
13. He II, Liu R, Desta T. Diabetic causes decrease osteoclastogenesis, reduced bone formation and enhanced apoptosis of osteoblastic cells in bacteria stimulated bone loss Endocrinology 2004; 145: 447-452.

Correspondence:

Saima Yunus Khan

4/1376 Sir Syed Nagar
Aligarh-202002 (U.P.) India