

Estimation of Serum Calcium Levels in Patients with Chronic Periodontitis in Kancheepuram District

Harsha.L*, Vishnu Priya. V**,Aroonika Bedra*, Deepika. V*

*1st year BDS, Saveetha Dental College and Hospitals, Chennai-77

**Associate professor, Department of Bio-Chemistry, Saveetha Dental College and Hospitals, Chennai-77

Abstract:

Aim:

The aim of this study is to estimate serum calcium levels in patients with chronic periodontitis in kanchipuram district.

Objective:

Low dietary intake of calcium has been a reason for periodontal disease. Hence in patients with chronic periodontitis ,serum calcium levels will be estimated.

Background :

Calcium is vital for proper development and maintenance of calcified oral tissues. These include the tissues incorporated into the structure of the teeth and the bone in which that are embedded. Dietary calcium has long been a reason for a number of periodontal diseases. Animal as well as human studies of calcium intake, bone mineral density, tooth Loss provide a rationale for hypothesising that low dietary take of calcium is a risk factor for periodontal diseases.

Method:

Blood samples will be collected and Serum calcium levels will be estimated in patients with chronic periodontitis in kanchipuram district.

Reason:

A decreased intake of calcium has adverse effects on the oral cavity leading to periodontitis and various other oral manifestations. The study is done to determine the level of calcium at which oral manifestations can be prevented and the level at which there is increased risk of periodontitis.

Keywords: Periodontitis, calcium, bone loss.

INTRODUCTION:

Nutrition plays an important role in overall wellness, including oral health. eating well and maintaining a healthy diet can help reduce the risk of developing problems in your mouth, including periodontal disease(1). Most people know that dairy products can help build strong bones.dairy products can also help reduce periodontal diseases. Dairy products are good sources of calcium, which has shown to lower periodontal diseases.(1).

Dietary calcium has long been a candidate to modulate periodontal disease. Animal as well as human status of calcium intake, bone mineral density, and tooth loss provide a rationale for hypothesizing that low dietary intake of calcium is a risk factor for periodontal disease.(2). Periodontal disease is a chronic condition characterized by loss of tooth supporting connective tissue and alveolar bone.(3) Periodontitis is a common disease affecting the tooth supporting structures . It is an inflammatory response to a bacterial challenge at gingival margin and represents a portal of entry for periodontal pathogens, bacterial endotoxins and proinflammatory cytokines.(4).

Chronic periodontitis may be sequel of chronic gingivitis, usually because of accumulation of plaque and calculus. The gingiva detaches from the tooth, the periodontal membrane and alveolar bone are damaged, and an abnormal gap(pocket) develops between the tooth and the gum the tooth may slowly loosen and eventually be lost(5). Numerous articles indicate that vitamin D and calcium deficiencies result in bone loss and increased inflammation, which are well recognised symptoms of periodontal disease.(6).

It is likely that chronically low intakes of calcium may led to a negative calcium balance, thus causing a secondary increase in calcium removal from the bone, including the alveolar bone . Such bone loss may contribute to weakening the tooth attachment apparatus(7).

The current study was hence carried out to know the effect of calcium on oral cavity especially on the periodontium.

MATERIALS AND METHODS:

The present study was conducted to determine the serum calcium levels, hence knowing its effect on the periodontium. The study was conducted among 16 periodontitis patients from Kanchipuram district referred to Saveetha dental college and hospitals, Chennai and 15 control from patients with healthy periodontium referred to the same institute. The patients were informed the procedure of the study, and an informed consent was signed.

INCLUSION CRITERIA:

PERIODONTITIS PATIENTS:

Subjects approval, Subjects with normal to chronic periodontitis were included., Subjects whose pocket depth was found to be more than 6 were included.

CONTROL PATIENTS:

Subjects approval , Subject who maintains a healthy oral environment

EXCLUSION CRITERIA:

PERIODONTITIS PATIENTS :

Periodontal surgery within the last year, Scaling and root planing as part of initial periodontal therapy, either the

past six months, History of diabetes, History of disease, conditions, or use of medications that might affect bone and mineral metabolism and periodontal health., Treatment of fluoride, Treatment with oestrogen, Treatment with bisphosphonates, Body mass index, Behavioural eating disorder, Current treatment with antibiotics.

MATERIALS USED:

2ml syringe, clot activator tubes, spirit, cotton, ERBA liquixx calcium (arsenazo III method, end point)

METHODOLOGY:

2ml serum sample of periodontitis patients was collected and the calcium levels were estimated using Arsenazo III method, end point.

PRINCIPLE:

Arsenazo III combines with calcium ions at pH 6.75 to form a coloured chromophore, the absorbance of which is measurement at 650nm(630-660nm) and is proportional to calcium concentration. Arsenazo III has a high affinity ($k^o = 1 \times 10^{-7}$) for calcium ions and shows no interference from other cations normally present in serum, plasma or urine.

The data was tabulated in MS Excel sheet and the statistics were obtained using SPSS software.

RESULT AND DISCUSSION:

T-Test

TABLE:1

Group Statistics

GROUP	N	Mean	Std. Deviation	Std. Error Mean
CALCIUM LEVEL PERIODONTITIS PATIENTS	16	11.688	7.6071	1.9018
CONTROL	15	9.407	1.3535	.3495

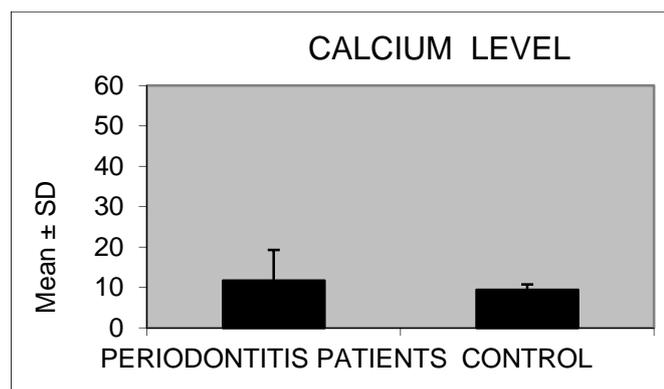


FIG-I: Level of Calcium in healthy controls and periodontitis patients.

The present study was an attempt to determine the effect of serum Calcium levels in patients with periodontitis. In the current study, it has been elucidated that an increased level

of serum calcium levels is observed in patients with periodontitis.

Periodontitis is the inflammation of the gingiva and the periodontal membrane, which may be a sequel of gingivitis, due to accumulation of plaque and calculus. In periodontitis the gingiva detaches from the tooth. Due to bone loss, there can also be loosening of teeth(5)

The normal serum calcium level in human is 8.5-10mg/dl. In the present study, the mean serum calcium level observed in periodontitis patients is altered when compared to control.

It has been evident that, low dietary intake of calcium results in bone loss. Hence the daily requirement of calcium in such cases results in bone loss to meet the needs of the body. One of the causes for periodontitis is loss of attachment of the gingiva due to loss of bone. This results in increased serum calcium levels.

In the present study, it has been observed that, there was a significant increase in serum calcium levels in patient's with periodontitis. The obtained results were in accordance to the studies conducted previously by Mieko Nishida et al and D.S Pushparani et al.

CONCLUSION:

Periodontal diseases are inflammatory in nature, such that it causes changes in the mineral content in the blood. In the present study, an increased level of serum calcium was observed. This had been evidenced by various studies conducted. Further studies may be required to determine calcium homeostasis with its regulatory mechanism in periodontitis patients.

REFERENCES:

1. Nutrition and oral health, June 2008, American Academy of Periodontology.
2. Mieko Nishida, Sara G. Grossi, Robert G. Dunford, Alex W.Ho, Maurizio Trevisan, Robert J. Genco. Calcium and the risk for periodontal diseases, Journal of periodontology, July 2000, vol 71, issue 7, pages 1057-1066.
3. Keiko Tanaka, Yoshihiro Miyake, Hitomi Okubo, Takashi Hanioka, Santoshi Sasaki, Nobuyuki Miyake, Masashi Arakawa. Calcium intake is associated with decreased prevalence of periodontal disease in young Japanese woman, Nutrition journal 2014, 13:109.
4. D.S Pushparani, S.Nirmala. High levels of serum calcium and iron influences the risk of type 2 diabetes mellitus with periodontitis, Journal of Asian Scientific Research, 2014, vol 4, issue 2, pages 70-82.
5. John Coventry, Gareth Griffiths, Crispian Scully, Maurizio Tonetti. BMJ. 2000, Sep 2; 321(7260): 562.
6. Dr. Charles F. Hildebolt, Effect of vitamin D and calcium on periodontitis, Journal of Periodontology, Sep 2005, vol 76, issue 9, pages 1576-1587.
7. D. Douglas Miley, M. Nathalia Garcia, Charles F Hildebolt, William D. Shannon, Rex A. Couture, Catherine L. Anderson Spearie, Debra A. Dixon, Eric M. Langenwalter, Cheryl Mueller, Roberto Civitelli. Cross sectional study of vitamin D and calcium supplementation effects on chronic periodontitis. J Periodontol 2009 Sep; vol 80, issue 9, pages 1433-1439.