Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr

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

Original Research

Assessment of salivary calcium level in post menopausal women

Adil Rasool Malik

MDS, Oral Pathology, Dental Surgeon at Directorate of Health Services, J & K Govt ., India

***ABSTRACT*:**
Background: Osteoporosis is defined as a progressive systemic skeletal disorder characterized by low bone mineral density. The present study was conducted to assess salivary calcium level in post menopausal women. **Materials & Methods:** The present study was conducted on 60 Women. Patients were divided into 3 groups of 20 each. In group I, healthy women were included, in group II, pregnant women and in group III, postmenopausal women were included. Two milliliters of unstimulated whole saliva was collected in 50 ml sterile plastic sample containers. The samples were then subjected to biochemical estimation of calcium. **Results:** In group I, mean calcium level was 3.14 µg/ml, in group II was 3.18 µg/ml and in group III was 7.15 µg/ml. The difference was significant (P< 0.05). **Conclusion:** Salivary calcium has important role in the detection of early bone changes in postmenopausal women.
Key words: Calcium, Pregnant, Post menopausal

Received: 8 June, 2019 Revised: 13 July, 2019 Accepted: 15 July, 2019

Corresponding Author: Dr. Adil Rasool Malik, MDS, Oral Pathology, Dental Surgeon at Directorate of Health Services, J & K Govt ., India

This article may be cited as: Malik AR. Assessment of salivary calcium level in post menopausal women. J Adv Med Dent Scie Res 2019;7(9):111-113.

INTRODUCTION

Osteoporosis is defined as a progressive systemic skeletal disorder characterized by low bone mineral density (BMD), deterioration of the microarchitecture of bone and an increased susceptibility to fractures. The World Health Organization (WHO) has proposed a clinical definition of osteoporosis as –A patient is osteoporotic if the BMD measurement is below 2.5 standard deviations of typical bone mass of young healthy white women.[1]

Postmenopausal osteoporosis affects women who are postmenopausal but younger than 70 years of age. These women are said to have postmenopausal osteoporosis when the WHO BMD criteria are observed within 15–20 years after the onset of menopause.[2] The disease is asymptomatic unless a fracture occurs. Osteoporosis affects mainly menopausal women and increases the risk of certain oral changes, such as xerostomia, which is a subjective sensation of dry mouth directly linked to decreased salivary flow. The prevalence of oral symptoms has been significantly greater (43%) in menopausal women. The method of choice for early detection of osteoporosis and risk of fracture is dual energy X-ray absorptiometry (DEXA), which is expensive and whose results are difficult to interpret.[3]

Calcium is the only electrolyte which does not show correlation with salivary flow rate. It has been reported that, in response to hormone replacement therapy, calcium concentration decreased, sodium increased, while no change was observed in the potassium concentrations in stimulated whole saliva during the follow-up period.[4] The present study was conducted to assess salivary calcium level in post menopausal women.

MATERIALS & METHODS

The present study was conducted in the department of Oral pathology. It comprised of 60 Women. All patients were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

Information such as name, age, gender etc. was noted. Patients were divided into 3 groups of 20 each. In group I,

healthy women were included, in group II, pregnant women and in group III, postmenopausal women were included. Two milliliters of unstimulated whole saliva was collected in 50 ml sterile plastic sample containers. The samples were then subjected to biochemical estimation of calcium using kit Erba Mannheim, Trans Asia Biomedicals Ltd. It was measured as Calcium in mg/dl = Abs. T/Abs. S × 10. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Groups (Healthy)	Group I (Pregnant)	Group II (Post menopausal)
Number	20	20	20

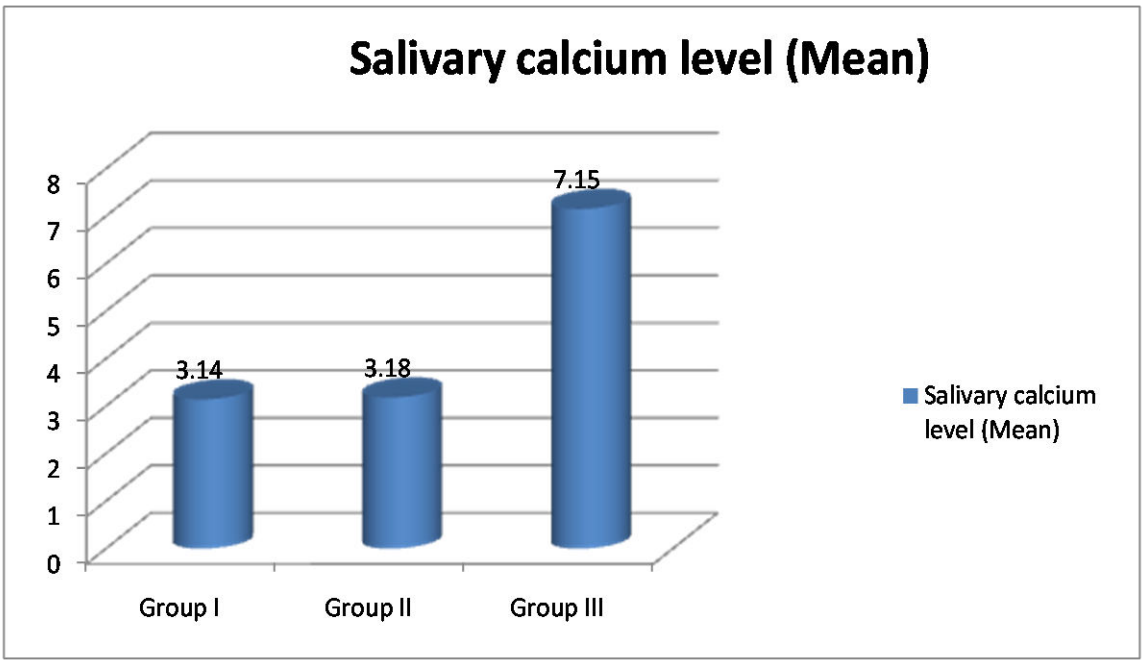
Table I shows that in group I, healthy women were included, in group II, pregnant women and in group III, postmenopausal women were included. Each group had 20 subjects.

Table II Comparison of salivary calcium level (µg/ml) in all groups

Groups	Salivary calcium level (Mean)	P value
Group I	3.14	0.02
Group II	3.18	
Group III	7.15	

Table II, graph I shows that in group I, mean calcium level was 3.14 µg/ml, in group II was 3.18 µg/ml and in group III was 7.15 µg/ml. The difference was significant (P< 0.05).

Graph I Salivary calcium level (µg/ml) in all groups



DISCUSSION

Osteoporosis is a chronic systemic skeletal disease characterized by low bone mass and micro-architectural deterioration, resulting in increased bone fragility and susceptibility to fracture.[5] The World Health Organization (WHO) has defined osteoporosis and osteopenia based on normal bone mineral density (BMD).[6] In the United States, osteoporosis affects more than 25 million people and predisposes patients to more than 1.3 million fractures annually. Women are at greater risk for osteoporosis after menopause.[7] Premenopausal estrogen levels are protective, as is hormone replacement therapy. Early menopause, either naturally occurring, drug or surgically induced without hormone replacement therapy predisposes to osteoporosis.[8] Data suggest that panoramic radiograph findings, such as progressive periodontal disease, alveolar bone resorption, tooth loss and endosteal resorption of the mandibular inferior cortex, may indicate general osteoporosis. If low BMD can be related to certain oral signs, the possibility of latent osteoporosis might prompt dentists to refer these patients for medical evaluation.[9] The present study was conducted to assess salivary calcium level in post menopausal women.

In present study, in group I, healthy women were included, in group II, pregnant women and in group III, postmenopausal women were included. Each group had 20 subjects. Saha et al[10] conducted a case-control study in 40 postmenopausal women with osteoporosis and 40 women without osteoporosis were considered. Salivary calcium concentrations were measured and expressed as mg/dL. Receiver operating characteristic curve analyses was used to determine the optimal cut-off thresholds for salivary calcium in healthy postmenopausal women. The cut-off point for salivary calcium was 6.1 mg/dL. The sensitivity and specificity, respectively, for identifying women with osteoporosis, were 67.5 and 60%. The area under curve (AUC) was 0.678, the positive predictive value (PPV) was 62.79 and negative predictive value (NPV) was 64.86%. The positive likelihood ratio was 1.688 and the negative likelihood ratio was 0.542. We found that in group I, mean calcium level was 3.14 μg/ml, in group II was 3.18 μg/ml and in group III was 7.15 μg/ml. Agha et al[11] in their study, ninety individuals divided into three groups of healthy controls, pregnant women and postmenopausal women were selected. Serum estrogen, salivary calcium and bone mineral density (BMD) at the heel region were estimated. Mean estrogen levels were 115.8 ± 80.18 pg/mmol in control group, 7729.4 ± 907.6 pg/mmol in pregnant group and 51.2 ± 74.51 pg/mmol in postmenopausal group, respectively. The mean salivary calcium in control, pregnant and postmenopausal groups was 3.12 ± 0.63, 3.19 ± 0.62 and 7.12 ± 0.79 μg/dl, respectively. Paired comparison within the groups showed high statistical significance (P = 0.0000) in the salivary calcium levels. The mean BMD of −2.3 (standard deviation [SD] ± 0.83) in the postmenopausal group was significantly lower than −0.6 (SD ± 0.99) and −0.2 (SD ± 1.42) of pregnant and control groups, respectively.

Puskulian et al[12] observed that calcium concentration in submandibular saliva was low during ovulation. They further observed that salivary calcium levels were lower during pregnancy than labor which directly correlated with the high estrogen levels. However, they could not appreciate any difference in the levels of salivary calcium between control and pregnant groups.

CONCLUSION

Authors found that salivary calcium has important role in the detection of early bone changes in postmenopausal women.

REFERENCES

1. Tohme JF, Bilezikian JP, Clemens TL, Silverberg SJ, Shane E, Lindsay R. Suppression of parathyroid hormone secretion with oral calcium in normal subjects and patients with primary hyperparathyroidism. J Clin Endocrinol Metab 1990;70:951‐6.
2. Leimola‐Virtanen R, Helenius H, Laine M. Hormone replacement therapy and some salivary antimicrobial factors in post‐ and perimenopausal women. Maturitas 1997;27:145‐51.
3. Ben Aryeh H, Gottlieb I, Ish‐Shalom S, David A, Szargel H, Laufer D. Oral complaints related to menopause. Maturitas 1996;24:185‐9.
4. Nagler RM, Hershkovich O. Relationships between age, drugs, oral sensorial complaints and salivary profile. Arch Oral Biol 2005;50:7‐16.
5. Agha‐Hosseini F, Mirzaii‐Dizgah I, Moghaddam PP, Akrad ZT. Stimulated whole salivary flow rate and composition in menopausal women with oral dryness feeling. Oral Dis 2007;13:320‐3.
6. Saluja P, Shetty V, Dave A, Arora M, Hans V, Madan A. Comparative evaluation of the effect of menstruation, pregnancy and menopause on salivary flow fate, pH and gustatory function. J Clin Diagn Res. 2014 Oct;8(10): 81-5.
7. Bains SK, Bhatia A. A single drop can diagnose many- Salivary diagnosis. J Stomatognathic Scie. 2014;4(1):15-20.
8. Bhatia A, Bains SK, Mehta R. Evaluation of salivary flow rate, pH and buffering capacity in pregnant and non pregnant women- A comparative study. J Adv Med Dent Scie Res 2019;7(8):42-45.
9. Sewon L, Laine M, Karjalainen S, Leimola‐Virtanen R, Hiidenkari T, Helenius H. The effect of hormone replacement therapy on salivary calcium concentrations in menopausal women. Arch Oral Biol 2000;45:201‐6.
10. Saha MK, Agrawal P, Saha SG, Vishwanathan V, Pathak V, Saiprasad SV et al. Evaluation of Correlation between salivary calcium, alkaline phosphatase and osteoporosis: A prospective, comparative and observational study. J Clin Diagn Res. 2017 Mar;11(3):ZC63-6.
11. Agha-Hosseini F, Mirzaii-Dizgah I, Moosavi MS. Relationship of serum and saliva calcium, phosphorus and alkaline phosphatase with dry mouth feeling in menopause. Gerodontology. 2012; 29(2):1092-7.
12. Puskulian L. Salivary electrolyte changes during the normal menstrual cycle. J Dent Res 1972;51:1212‐6.