Salivary, Serum Osteocalcine and Alkaline phosphatase Biomarkers with Periodontal status in Postmenopause Women with Osteoporosis

A Thesis

Submitted to the Council of the College of Dentistry,

University of Baghdad

In partial fulfillment of the Requirements for the

Degree of Master of Science

In Oral Medicine

By

Maytham Riad Ali

B.D.S.

Supervised by

Professor Dr. Taghreed Fadhil Zaidan

B.D.S., MSc., PhD. (Oral Medicine)

2013 AD *1434AH*

ABSTRACT

Background:

Osteoporosisis an asymptomatic, systemic, skeletal disease characterized by decreased bone density and changes in bone microarchitecture that reduce bone strength and increase fragility, postmenopausal osteoporosis (type I osteoporosis) represents a frequent disease in female patients with onset menopause, and the reduction of estrogen hormone after menopause represent the main cause. Both osteoporosis and periodontal disease represent major health problems especially in elderly women. Discussions about the association between these two bone-damaging diseases began in 1960. However, the exact relationship between the diseases is still uncertain.

Aims of the study:

The purposes of this study was to examine the periodontal status (clinical attachment loss and number of missing teeth) and to investigate the concentration of osteocalcine and alkaline phosphatase of both saliva and serum in postmenopausal women with and without osteoporosis and to elucidate the possible role of the osteoporosis in these oral findings and results of investigation.

Subjects, materials and methods:

Bone minerals density and skeletal structures of the spine or femur were evaluated by using central dual energy x-ray in Mirjan Medical Center in Babylon in (72) postmenopause women, which were divided to three groups postmenopause with osteoporosis (24) women , with osteopenia (24)women and non-osteoporosis non- osteopenia control group (24) women according to dual energy x-ray results.

The assessment of clinical attachment loss was done by combination of gingival recession and clinical pocket depth using William periodontal probe in six Ramfjord index teeth. Calculation of missing teeth was also done.

Whole saliva and blood serum had been collected for determination of osteocalcin concentration which was made using a chemiluminescence technique, also alkaline phosphatase concentration were determined using colorimetric determination of alkaline phosphates activity kit.

Results:

It has been shown that the bone minerals density and body mass index were significantly lower in postmenopause women with osteoporosis than that in postmenopause women with osteopenia and that in control subjects.

Regarding, clinical attachments loss, number of missing teeth, serum and salivary osteocalcine and serum alkaline phosphatase were statistically higher in patients with osteoporosis than in other studied groups. While no significant difference ($P > 0.05$) was found between studied groups according to saliva alkaline phosphatase.

In postmenopausal osteoporosis women a negative significant linear correlation was found between age and body mass index. While significant positive linear correlation was found between serum osteocalcine and clinical attachment loss; clinical attachment loss and number of missing teeth.

Conclusions:

Although, that no significant correlation was found between oral and laboratory findings with bone mineral density in the present study. But there were significant differences in the studied parameters between studied groups, the clinical attachment loss and number of missing teeth were higher in osteoporotic patients than in non-osteoporotic subjects.

The increase in serum, saliva ostecalcine and serum alkaline phosphatase in postmenopause women with osteoporosis indicate rapid bone turn over. So these oral findings and laboratory results can be helpful in predication of osteoporosis when used with age and body mass index.