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Presence of Salivary Estrone Levels in Completely Edentulous Female Patients

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ABSTRACT

Estrogens are known to be involved in both the female and male reproductive systems, as well as both physiological and pathological regulation of cells and tissues. Estrogens consist of three major forms, estrone, estradiol and estriol. Estrone is one of the weakest types of the Estrogens. It can increase the risk of osteoporosis fatigue and can cause ridge resorption. **Materials and methods**: Eight completely Edentulous patients were selected. Four were pre menopause and four were post menopause. Saliva samples were collected and given to the lab for optical density using micro plates. The optical density was determined by each well within 30 min, using a microplate reader set to 450 nm. **Results and discussion**: According to the graph, High estrone level was seen in post menopause when compared the premenopause where the peak of optical density was seen 1.29 pg/ml. Estrone level was higher in post menopause patients as compared to premenopausal patients. High estrone level can increase the bone defect and could cause hindrance in placing implant as it affects the bone density. **Conclusion:** It can be concluded that high estrone levels are seen in postmenopausal patients that could cause hindrance in placing implants as it affects the bone density. Bone density affects alveolar bone resorption level, the lower bone density on postmenopausal women the higher alveolar bone resorption level.

Keywords: Estrone, osteoporosis, postmenopause, ridge resorption.

INTRODUCTION

Estrogens are known to be involved in both the female and male reproductive systems, as well as both physiological and pathological regulation of cells and tissues. Estrogens consist of three major forms, estrone, estradiol and estriol (1). Estrone is one of the weakest types of the estrogens. It continues to be made after menopause when periods stop. Estrone can increase the risk of osteoporosis, fatigue. Osteoporosis is considered as a physiologic process estimated to be approximately 23% prevalent in Saudi women aged 50–70 years (2). It is a systemic disease of skeletal tissue typically characterized by low bone mass and causing microarchitecture of bone tissue to deteriorate and an increase in fragility. Postmenopausal women with osteoporosis are also susceptible to an excessive response to dental plaque (3). Pathological effect of minerals on bones, including the ability to promote inflammation, disruption of the host inflammatory response is pertinent to periodontal disease and considered to be a primary factor in disease progression and subsequent alveolar bone loss (4). High estrone levels can cause increased risk of breast cancer and uterine cancer.

Estrogens are known to be involved in both the female and male reproductive systems, as well as both physiological and pathological regulation of cells and tissues (5). Estrogens consist of three major forms, estrone, estradiol and estriol, and function via two distinct nuclear receptors, estrogen receptor (ER)-α and ER-β. Estrogens are able to stimulate proliferation of basal epithelial cells and differentiation epithelium, leading to up-

regulated epithelial keratinization. Since ER-β is expressed on human oral epithelium, estrogens clearly play a crucial role in both the physiology and pathology of oral epithelium (6). Measurement of salivary estrogen levels is, therefore, useful to detect the individual systemic or oral condition(7,8).The aim of this study is to assess the salivary estrone levels in completely Edentulous patients.

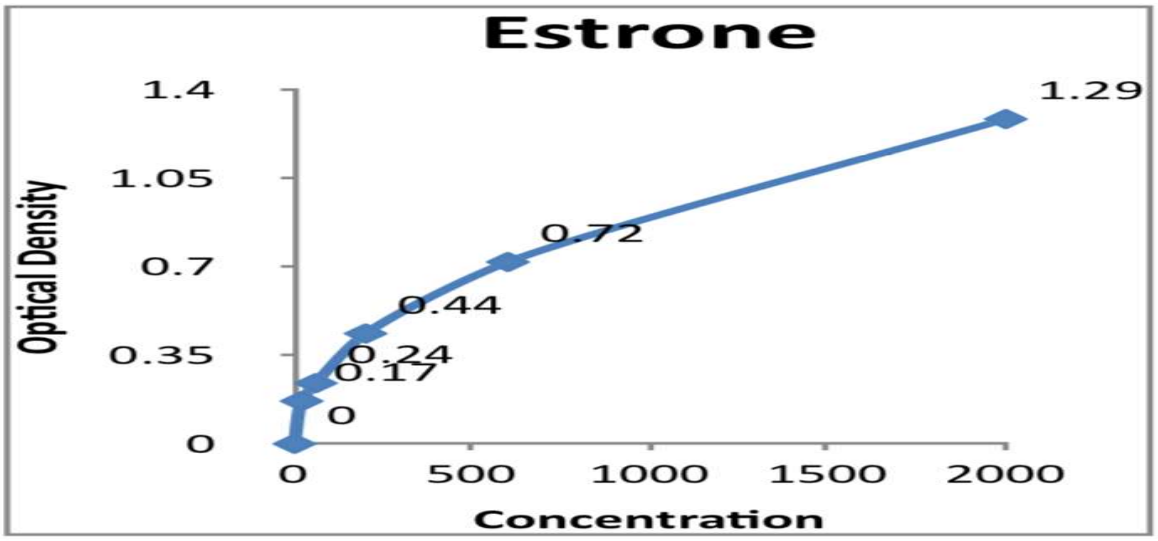
MATERIALS AND METHODS

Eight completely edentulous patients were selected. Four were pre menopause and four were post menopause. Saliva samples were collected and given to the lab for optical density using micro plates. Remove excess microplate strips from the plate frame, return them to the foil pouch containing the desiccant pack, and reseal. Add 50 µL standard or sample per well (9). It is recommended that all standards and samples be added in duplicate to the microplate. Set a blank well without any solution. Add 50 µL working solution to each well (not to blank well), Mix well, cover with the plate cover provided and then incubate for 1 h at 37°C. Remove liquid in each well and wash, repeating the process for a total of three washes (10). Wash by filling each well with 1×Wash Buffer (250 µL) using a Multi channel pipette or automated microplate washer, and let it stand for 10 s, complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining 1×Wash Buffer by inverting the plate and blot it against clean paper towels. Add 50 µL HRP substrate A and 50 µL HRP substrate B to each well, mix well and cover with the plate cover provided (11). Incubate for 15 min at 37°C. Keeping the plate away from drafts and other temperature fluctuations in the dark. Add 50 µL Stop solution to each well. Stop Solution should be added to the plate in the same order as HRP substrate(12). The color in the wells should change from blue to yellow. If the color in the wells is green or if the color change does not appear uniform, gently tap the plate to ensure thorough mixing. Determine the optical density of each well within 30 min, using a microplate reader set to 450 nm.

RESULTS

Sample	OD	Conc (pg/ ml)
< 50 years	0.48	220.1835
	0.32	146.789
	0.36	165.1376
	0.42	192.6606
> 60 years	1.101	505.0459
	1.126	516.5138
	1.118	512.844
	1.132	519.2661

Table 1: Optical densities of samples (<50 years and >60 years)



Graph 1: optical density of estrone level

DISCUSSION

According to the graph, High estrone level was seen in post menopause when compared to premenopausal where the peak of optical density was seen at 1.29 pg/ml. Estrone level was higher in post menopause patients as compared to premenopausal patients. High estrone level can increase the bone defect and could cause hindrance in placing implant as it affects the bone density (13). Osteoporotic postmenopausal women tend to had a high level of alveolar bone resorption due to the fact that higher alveolar bone resorption level are commonly found on osteoporotic than osteopenia (14). This indicates the change in a high level alveolar bone resorption occurs as the bone density decreases (15). This might caused by estrogen hormone deficiency that occurred on postmenopausal women (15,16). Estrogen hormone can highly alter bone development. On postmenopausal period, decrease of estrogen quantity occurs, hence disturbing bone development process and bone remodeling (17,18). The bone development disturbance and bone remodeling causes bone density decrease (osteopenia and osteoporosis) (19). Bone density occurs equally on every bone in the human body, including jaw bones (maxilla and mandible) (20). Several study reported there is correlation between bone density, jaw bone density, alveolar crest height, and alveolar bone resorption on edentulous area (21–23). Payne stated that osteoporosis is one of the factors that caused alveolar bone density decrease (24). Aging process and estrogen hormone deficiency cause osteopenia. In this study, they were related to post- menopausal condition. Some other study related the occurence of osteopenia because of estrogen hormone deficiency on postmenopausal condition, and the alveolar bone resorption caused by decreased of bone density (25). Bone characteristic change on osteopenia postmenopausal women could be observed by bone density condition, alveolar bone resorption level and the tooth loss.

CONCLUSION

It can be concluded that high estrone levels are seen in postmenopausal patients that could cause hindrance in placing implants as it affects the bone density. Bone density affects alveolar bone resorption level, the lower bone density on postmenopausal women the higher alveolar bone resorption level. Postmenopausal women who experience a decrease of bone density (osteopenia or osteoporosis) will suffer jaw bone osteopenia or osteoporosis which cause alveolar bone resorption. This study found a tendency, that women with normal bone density suffer low alveolar bone resorption, osteopenic women suf- fer moderate alveolar bone resorption and osteoporotic women suffer high alveolar bone resorption.

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