ORIGINAL ARTICLE

The Linkage of Gum Disease with Oncogenesis of Breast Tumor in Pakistani Women – A New Prospective

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ABSTRACT

Aim: To find out the relation between Chronic Periodontitis and oncogenesis and to estimate the severity of disease and concentration of carcinogens in blood.
Study design: Cross sectional study
Methods: A total of 400 women, including 200 chronic periodontitis patients and 200 healthy controls between the ages of 30-40 years. Blood sample were drawn at the time of menstruation from all women and serum concentrations of 16α-hydroxyestrone and 17β-estradiol were measured by using standard Enzyme linked immunosorbent assay (ELISA) method. These parameters were compared in chronic periodontitis pts & age gender matched healthy controls to observe significance of difference.
Results: Serum concentrations of these carcinogens in chronic periodontitis patients of Pakistan were statistically significantly elevated and were above normal reference value in chronic Periodontitis patients as compared to healthy controls. Chronic periodontitis has heavy influence at otherwise healthy women population and the probability of being at risk for cancer had appreciably increased.
Keywords: Periodontitis, breast tumor,

INTRODUCTION

Gums inflammation (gingivitis) is a hidden and pain free disease mostly and gum remained inflamed without getting proper attention of the patient. This lack of self care lead to a dangerous disease called periodontitis which itself is a quiet enemy and weakened the teeth, destroys alveolar bone which hold the tooth and also damages the periodontal ligament which act as a rope to hold the teeth together [1]. Huge quantities of local community gets affected by this disease and it is especially usual in adults as much as that 20-30% of most of the people has chronic periodontitis as defined by the criteria of occurrence of three or more teeth with pockets of ≥4 mm. So in short chronic periodontitis is most frequently occurring disease recognized as soreness of gums, resulting in damage of systemic health of patient. The systemic health damage is host dependent and modified by variety of heritable or ecological factors [2]. Few researches have shown that there might be some link of active periodontitis and breast tumor carcinogens/ tumor markers which are also famous as breast cancer markers. In this research we evaluated 16α-hydroxyestrone, 17β-estradiol and serum cholesterol in patients of Chronic Periodontitis[3-5].

Estrogens and cancer are connected as their metabolites have genotoxic personality and are supposed to trigger mitosis which makes them the risk factor for development of breast cancer. 16-alpha-hydroxyestrone has reputation of 'The wicked Estrogen' because its existence ensures the confirmation of breast cancer risk. As established by many studies in past that the amount of 16α-hydroxylation was elevated in women with breast lump. 17β-estradiol (E2) encourages breast cancer cell movement and assault. These outcomes presents the innovative approach about the foundation of estrogen effects on breast cancer development and draws attention to probable patients to treat estrogen related breast cancers. It is best to test 16α-hydroxyestrone and 17β-estradiol at the time of menstruation [3-8].

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MATERIALS & METHODS

This cross sectional study involved a total of 400 women, including 200 chronic periodontitis patients and 200 healthy controls between the ages of 30-40 years. A detailed personal history, past medical and dental history was taken and individuals with history of cancer, heart disease, hypertension, smoking, diabetes mellitus, autoimmune disease, asthma, familial hypercholesterolemia and history of steroid intake or with any other chronic illness were excluded from the study. Patients of chronic periodontitis were selected using Community Periodontal Index of Treatment Needs (CPITN). Blood sample were drawn during menstruation from all women and serum concentrations of 16α-hydroxyestrone and 17β-estradiol were measured by using standard Enzyme linked immunosorbent assay (ELISA) method. These

parameters were compared in Chronic Periodontitis patients and age gender matched healthy controls to observe the significance of difference. Statistical analysis was carried out with SPSS. The data was expressed as mean ± standard deviation. The significance of differences between two groups of data was done by applying student`s t- test. p value less than 0. 05 was considered statistically significant and p<0. 001 was considered highly significant

RESULTS

Results of the present study conducted in chronic periodontitis patients and healthy controls were observed as follow:- Dental variables in patients of chronic periodontitis and healthy controls were summarized in table 1. Bleeding from gums was negligible in controls but in most of patients there was severe bleeding while probing. Calculus index in CP patients was 4.89 ± 0.60 and in controls was 0.25 ± 0.41. Community Periodontal Index of Treatment Needs (CPTIN) in CP patients was 3.86 ± 0.35 and controls was 0.11 ± 0.32. Mean Pocket depth in CP patients was 6.86 ± 0.70 and in controls was 0.64 ± 0.64. Number of mobile teeth in CP patients was 7.64 ± 2.36 and in controls was 0.00 ± 0.00. Gingival recession in CP patients was severe in 60% of patients and moderate in 40% patients and was not observed in controls. The results of this study showed that serum concentrations of tumor markers in chronic periodontitis patients of Pakistani women were statistically significantly elevated in patients as compared healthy controls as observed in table 2.

The correlation between these markers and severity of chronic periodontitis was also evaluated and a highly significant positive correlation with the severity of disease was found as shown in table 3.

Table 1: Comparison of dental variables in patients of chronic periodontitis and healthy controls

Parameter	Patients Mean±SD (n=200)	Healthy controls Mean ± SD (n=200)	p value
Color and Texture of gingiva	25% (Shiny grey and red, no stippling) 75% (Red, shiny, no stippling) =>100% periodontitis	78% (Coral Pink with stippling) 12% (pigmented with stippling) => 0% periodontitis	
Bleeding from gums	100% bleeding (75% Severe Bleeding and 25% Moderate Bleeding)	2% bleeding	
Number of tooth intact	28 ±1.0	28± 2	0.33
Dentition involved in periodontitis in percentage	79.00 ± 3.00	0.00 ± 0.00	0.001*
Teeth with furcation involvement	7.0 ± 2.0	0.00 ± 0.00	0.001*
Extent of bone loss	34.00 ± 15.0	0.00 ± 0.00	0.001*
Radio graphic analysis of disease severity	100% 75% Severe 25% Moderate	0%	
Calculus index	4.80 ± 0.70	0.20 ± 0.40	0.001*
Community Periodontal Index of Treatment Needs	3.0 ± 0.30	0.10 ± 0.30	0.001*
Mean Pocket depth	6.0 ± 0.70	0.60 ± 0.60	0.001*
Number of mobile teeth	7.60 ± 2.30	0.00 ± 0.00	0.001*
Gingival recession	100% 75% Severe 25% Moderate	0%	

Table 2: Serum concentrations of tumor markers in Chronic Periodontitis patients and healthy controls

Parameter	Patients (mean ± SD) (n=200)	Healthy controls (mean ± SD) (n=200)
*16α-hydroxyestrone (pg/ml)	400.27± 9.01	302.55± 2.23
*17β-estradiol (pg/ml)	102.1± 4.00	55.24± 3.21

*Pvalue:0.001

Table 3: Serum concentrations of tumor markers in mild, moderate and severe patients of Chronic Periodontitis

Parameter	Mild Chronic Periodontitis Patients (mean ± SD)	Moderate Ch Periodontitis Patients (mean ± SD)	Severe Chronic Periodontitis Patients (mean ± SD)
16α-hydroxyestrone (pg/ml)*	342.14±6.11	387.50± 3.54	462.22±7.01
17β-estradiol (pg/ml)*	70.1±5.99	109.14± 1.11	129.1± 4.07

*Pvalue: 0.001

DISCUSSION

Periodontitis is a disparaging inflammatory disease of the supporting tissues of the teeth caused by single or multiple microorganism leads to destruction of periodontal ligament and alveolar bone with common symptoms of bleeding from gums and bad odor from mouth. The communication between oral and systemic health is complex and sufficient research on this relationship is under process[1].

Chronic periodontal disease appears to associate statistically with breast cancer in a research conducted in 2011 by Sodar et al. The study analyzed and evaluated over 3000 women between the ages of 30 and 40 years over a 16-year period and promotes the idea of developing breast cancer under influence of chronic gum disease[5].

The correlation between periodontal disease related tooth loss and incidence of breast cancer suggests that the bacterial infection associated with periodontal disease was the risk factor for breast cancer[9]. The results of current study also showed that serum concentrations of tumor markers were statistically significantly elevated in chronic periodontitis patients as compared with healthy controls which favor the results of past researches mentioned above.

CONCLUSIONS

This study was conducted in Pakistan to satiate the escalating requirement of silent but highly prevalent disease. Under the influence of chronic periodontitis in otherwise healthy women population, the probability of being at medium or high risk for breast cancer had appreciably augmented. The present study confirms that serum concentrations of tumor markers in chronic periodontitis patients depends upon severity of disease, spurt of disease, number of mobile tooth, bone loss percentage, furcation involvement and number of periodontal pockets.

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