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ANALYSIS OF BIOMARKERS IN CHRONIC PERIODONTITIS PATIENTS AMONG LOCAL POPULATION OF PAKISTAN

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Abstract:

Introduction: *Chronic periodontitis, characterized by inflammation and destruction of periodontal supporting tissues, is one of the most common oral diseases worldwide.* ***Aims and objectives:*** *The main objective of the study is to analyse the biomarkers in chronic periodontitis patients among local population of Pakistan.* ***Material and methods:*** *This descriptive study was conducted in RHC Kot Qazi during November 2018 to March 2019. The data was collected with the permission of ethical committee of hospital. The data was collected from 100 patients. Five ml of fasting fresh blood sample was taken from all the patients.* ***Results:*** *The data was collected from 100 patients of both male and females. The mean age was 40.52±5.65 years. The mean values of serum ALP and Ca (10.28 mg/dL) was higher in female subjects as compared to the male subjects. The noted in females and positive in male subjects. Significant correlation of CPK (p = 0.001) was found with age in females while positive correlation was found for CPK in both the groups with other variables.* ***Conclusion:*** *It is concluded that chronic periodontitis was associated with systemic oxidative stress in human bodies. Female subjects are at greater risk of periodontitis and alveolar bone degradation in term of mean values of serum ALP and Ca than the male subjects.*

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INTRODUCTION:

Chronic periodontitis, characterized by inflammation and destruction of periodontal supporting tissues, is one of the most common oral diseases worldwide. Over 47% of American people had chronic periodontitis, and the prevalence is even higher in developing countries. Chronic periodontitis is initially caused by various hyper responsive and destructive products of immune response stimulated by microbial plaque around the gingival margin [1].

In the pathogenesis of periodontitis, poly morpho nuclear leukocytes (PMN) act as the primary mediators of the host response against proliferating periodontal pathogenic microorganisms. Activated PMN produce a large amount of reactive oxygen species (ROS) and result in destruction of periodontal tissues [2]. There is some suggestive evidence that periodontal inflammation might be associated with systemic oxidative stress. Recently, abundant evidence has shown that periodontal diseases were highly associated with several inflammation-related systemic diseases, such as chronic respiratory diseases, cardiovascular disease, and diabetes mellitus [3].

Periodontitis is a group of inflammatory diseases that affect the connective tissue attachment and supporting bone around the teeth. It is widely accepted that the initiation and the progression of periodontitis are dependent on the presence of virulent microorganisms capable of causing disease [4]. Although the bacteria are initiating agents in periodontitis, the host response to the pathogenic infection is critical to disease progression. After its initiation, the disease progresses with the loss of collagen fibers and attachment to the cemental surface, apical migration of the junctional epithelium, formation of deepened periodontal pockets, and resorption of alveolar bone [5]. If left untreated, the disease continues with progressive bone destruction, leading to tooth mobility and subsequent tooth loss. Periodontal disease afflicts over 50% of the adult population in the United States, with approximately 10% displaying severe disease concomitant with early tooth loss [6].

Aims and objectives

The main objective of the study is to analyse the biomarkers in chronic periodontitis patients among local population of Pakistan.

MATERIAL AND METHODS:

This descriptive study was conducted in RHC Kot Qazi during November 2018 to March 2019. The data was collected with the permission of ethical committee of hospital. The data was collected from 100 patients. Five ml of fasting fresh blood sample was taken from all the patients. Then this blood was centrifuged at 4000 rpm for 10 minutes. Serum was separated and was analysed for the quantification of serum ALP, CPK and Ca using standard methods.

Statistical analysis

Statistical analysis of the acquired data was carried out using SPSS 21.0 software and Microsoft Excel. Values were reported as mean ± standard deviation.

RESULTS:

The data was collected from 100 patients of both male and females. The mean age was 40.52±5.65 years. The mean values of serum ALP (203.92 U/I) and Ca (10.28 mg/dL) was higher in female subjects as compared to the male subjects. The noted in females and positive in male subjects. Significant correlation of CPK (p = 0.001) was found with age in females while positive correlation was found for CPK in both the groups with other variables.

Table 01: Analysis of ALP, Ca and CPK values of serum

Gender	Parameter	ALP		CPK		Ca	
		r	ρ	r	ρ	r	ρ
F	Age	0.269	0.094	0.497**	0.001	0.000	1.000
	BMI	-0.163	0.315	-0.163	0.316	0.402**	0.010
M	Age	0.012	0.943	0.205	0.204	-0.217	0.178
	BMI	0.130	0.422	-0.033	0.815	0.135	0.407

DISCUSSION:

The activity of CPK increases in gingival inflammation and is considered as an important marker both in periodontal disease and cardiovascular diseases. Shimazaki et al observed a significant negative association between normal serum CPK level and periodontitis in male subjects [7]. Calcium is a potent biochemical marker for determination of decalcification and structural changes in alveolar bone, as calcium concentration rises in the patients with chronic periodontitis. In case of calcium deficiency desorption of alveolar bone show the initial structural changes in periodontitis [8].

Periodontal diseases are strongly linked with cardiovascular and chronic kidney diseases, but the association is not very much clearly understood. The elevated level of CPK observed in this study add evidence in these relations and open up a new possible pathway in the complex puzzle that is a periodontal-systemic health relation [9]. Periodontal disease is associated with many other diseases. ALP, CPK and Ca are not only used to detect the level/degree of dental diseases but are also used to measure the patient's overall health status [10]. The potential role of ALP, CPK and Ca in measuring the extent and cause of disease could be useful in measuring other diseases that are related to dental diseases. Chronic periodontitis get worsen with age along with other risk factors [11]. Various risk factors which can induce periodontitis can be minimized by maintaining proper oral hygienic measures and our study concluded that lifestyle related risk factors associated with chronic periodontitis results in the progression of disease [12]. Prevention is the better way of limiting diseases. Dental diseases are mostly related with the person's lifestyle [13].

CONCLUSION:

It is concluded that chronic periodontitis was associated with systemic oxidative stress in human bodies. Female subjects are at greater risk of periodontitis and alveolar bone degradation in term of mean values of serum ALP and Ca than the male subjects.

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