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Assessment of Gingival Crevicular Fluid Periostin Levels in Gingivitis Patients: A Case Control Study

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ABSTRACT

Background: Gingival pathologies occur as a result of interaction between the Immuno-inflammatory events of host and subgingival biofilm. Gingivitis is an inflammatory condition of the gingival tissue or the gums most commonly due to a bacterial infection. Periostin (POSTN) is found to be important in the regulation of the formation of bone. Hence, the present study was conducted for assessing GCF periostin levels in gingivitis patients.

Materials & methods: A total of 20 patients with the presence of chronic gingivitis and 20 healthy controls were included in the present study. Complete demographic and clinical details of all the patients were obtained. A Performa complete clinical findings of all the patients was recorded. GCF samples were obtained using sterile strips and were sent to a laboratory where an auto-analyser was used for assessing the GCF periostin levels. All the results were recorded and compared statistically using SPSS software.

Results: Mean GCF Periostin levels among the study groups and control group patients was 35.69 and 25.18pg/µL, respectively. Significant results were obtained while comparing the mean GCF Periostin levels among the study group and control group.

Conclusion: GCF Periostin level should be contemplated as a dependable marker in gingival disease diagnosis and its activity.

Keywords: Periostin, Gingival crevicular fluid.

INTRODUCTION

Gingival pathologies occur as a result of interaction between the Immuno-inflammatory events of host and subgingival biofilm. Gingivitis is an inflammatory condition of the gingival tissue or the gums most commonly due to a bacterial infection. It is inflammation of the gingiva with the attachment of the connective tissue to the tooth remaining at the original level, i.e., without attachment loss. This activity describes the evaluation and management of gingivitis and highlights the role of the interprofessional team in managing patients with this condition.[1-3] Periostin (POSTN) is found to be important in the regulation of the formation of bone. Biologically, the functions of POSTN also include the maintenance of the integrity of connective tissue in both states of health and disease. It functions as a matricellular protein inactivation of the cell by attaching to their cell surface receptors, thus exerting its actions of biological nature. POSTN, secreted by fibroblasts, is

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found to be present in various tissues, serum, saliva and also gingival crevicular fluid (GCF).[4- 6] Hence; the present study was conducted for assessing GCF periostin levels in gingivitis patients.

MATERIALS & METHODS

The present study was conducted with the aim of assessing GCF periostin levels in gingivitis patients. A total of 20 patients with the presence of chronic gingivitis and 20 healthy controls were included in the present study. Complete demographic and clinical details of all the patients were obtained. A Performa complete clinical findings of all the patients was recorded. GCF samples were obtained using sterile strips and were sent to a laboratory where an auto-analyser was used for assessing the GCF periostin levels. All the results were recorded and compared statistically using SPSS software.

RESULTS

The mean age of the patients of the gingivitis group and control group was 43.5 years and 46.8 years, respectively. There were 12 males and 8 females in the gingivitis group and 10 males and 10 females in the control group. Mean GCF Periostin levels among the study groups and control group patients was 35.69 and 25.18pg/µL, respectively. Significant results were obtained while comparing the mean GCF Periostin levels among the study group and control group.

Table 1: Demographic data

Parameter	Study group	Control group
Mean age (years)	43.5	46.8
Males (n)	12	8
Females (n)	10	10

Table 2: Comparison of GCF Periostin levels.

GCF Periostin levels (pg/µL)	Study group	Control group
Mean	35.69	25.18
SD	12.45	9.28
p- value	0.00 (Significant)	

DISCUSSION

Periostin is an 811 amino acid protein originally identified in murine osteoblasts. Periostin showed structural similarity with fasciclin-1, which is an insect axonal guidance protein, and it is also termed as osteoblast-specific factor-2. Periostin derived its name because of its expression in the periodontal ligament and periosteum. It is an extracellular matrix protein, has a role in connective tissue integrity and cell migration and adhesion. Another important role of periostin is wound repair, which causes interaction of type I collagen with fibronectin, thereby helps in remodelling the periodontium.[7- 10] Hence, the present study was conducted for assessing GCF periostin levels in gingivitis patients.

U Balli et al. investigated periostin levels in the gingival crevicular fluid and serum of patients with periodontal disease and compared them with those of healthy individuals. Eighty individuals (41 males and 39 females; age range: 25-48 years) were enrolled in the study. Individuals were divided into three groups following clinical and radiographic examinations: the periodontal-healthy group (n = 20), gingivitis group (n = 30) and chronic periodontitis group (n = 30). Gingival crevicular fluid and serum samples were collected, and periostin levels were determined using the enzyme-linked immunosorbent assay. The total amount and concentration of periostin decreased in gingival crevicular fluid with the progression and severity of the disease from healthy controls to gingivitis and to chronic periodontitis groups and differed significantly ($p < 0.05$). However, there was no significant difference in serum periostin concentration within all groups ($p > 0.05$). Periostin in gingival crevicular fluid negatively correlated with the gingival index in the periodontal disease groups, whereas it is inversely correlated with the clinical attachment level only in the periodontitis group ($p < 0.05$). When all the clinical groups were examined together, the periostin concentration negatively correlated with clinical attachment level and gingival index; moreover, total periostin positively correlated with periostin concentration and clinical attachment level ($p < 0.05$). The periostin levels in gingival crevicular fluid decreased proportionally with the progression and severity of periodontal disease and negatively correlated with the clinical parameters.[10]

Sophia K et al. compared the gingival crevicular fluid and serum periostin levels in subjects having chronic periodontitis, gingivitis and healthy periodontium. Ninety patients belonging to both sexes were categorized into three groups, 30 patients each as healthy periodontium (Group I), chronic gingivitis (Group II) and generalised chronic periodontitis (Group III). The clinical parameters included assessment of plaque index (PI), gingival index (GI), probing pocket depth (PPD) and clinical attachment level (CAL). Gingival crevicular fluid (GCF) and serum samples were collected, and the enzyme-linked immunosorbent assay was used to estimate periostin levels. Periostin levels in GCF were comparatively low in the chronic periodontitis than in the gingivitis and healthy periodontium groups, and the difference was statistically significant. No statistical difference was found for serum periostin levels among Group I, Group II and Group III. In a comparison of clinical parameters, a significant difference was noticed among the three groups. GCF periostin levels were correlated inversely with the clinical parameters in chronic periodontitis patients. GCF periostin levels were gradually reduced with the increase in severity of the periodontal disease.[11]

CONCLUSION

From the above results, the authors concluded that GCF periostin levels could be contemplated as a dependable marker in gingival disease diagnosis and its activity.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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