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Original Research

Assessment of RANTES levels in periodontitis patients: A case control study

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***ABSTRACT*:**

Background: Periodontitis results from the inflammatory response of the host to the bacterial challenge in the gingival crevicular area. Regulated on activation, normal T cell expressed and secreted (RANTES) is a member of the C-C chemokine subfamily and is produced by fibroblasts, lymphoid and epithelial cells of the mucosa. Hence; the present study was undertaken for assessing the RANTES levels in GCF of patients with periodontitis. **Materials & methods:** A total of 25 patients with radiographic and clinical diagnosis of periodontitis were included in Group 1 and 25 healthy subjects were enrolled as Group 2. For collection of GCF, area was isolated with cotton rolls and crevicular area was dried using an air syringe. GCF was collected by placing the filter paper strips into the sulcus for thirty seconds. Obtained samples were transported to the laboratory in sterile test tube where ELISA technique and auto-analyzer was used for evaluation of RANTES levels. All the results were recorded and analyzed by SPSS software. **Results:** Mean RANTES levels of the patients of the periodontitis group and the control group was found to be 69.4 pg/µL and 13.4 pg/µL respectively. While comparing the mean RANTES levels of the patients of the periodontitis group and the control group, significant results were obtained. **Conclusion:** RANTES levels are significantly raised in periodontitis patients highlighting their role in the pathogenesis of the disease.

Key words: Periodontitis, RANTES

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INTRODUCTION

Periodontitis results from the inflammatory response of the host to the bacterial challenge in the gingival crevicular area. Although bacteria are essential in the induction of the inflammatory response in the periodontal tissues, they are insufficient to cause destructive periodontal disease. It is generally acknowledged that not everyone is equally susceptible to the disease, which implicates intrinsic differences in the host immune response. Gingivitis is an inflammatory disease of bacterial origin initiated and perpetuated by pathogenic bacteria. The disease is characterized by infiltration of inflammatory cells like neutrophils, macrophages, etc.[1- 3]

Regulated on activation, normal T cell expressed and secreted (RANTES) is a member of the C-C chemokine subfamily and is produced by fibroblasts, lymphoid and epithelial cells of the mucosa in response to various external stimuli. RANTES expression has been demonstrated as an important proinflammatory mediator in a variety of diseases characterized by inflammation, including asthma, transplantation-associated accelerated atherosclerosis, endometriosis and fibrosis.[4- 6] Hence; the present study was undertaken for assessing the RANTES levels in GCF of patients with periodontitis.

MATERIALS & METHODS

The present study was conducted with the aim of assessing the RANTES levels in GCF of patients with periodontitis. A total of 25 patients with radiographic and clinical diagnosis of periodontitis were included in Group 1 and 25 healthy subjects were enrolled as Group 2. Criteria described in previous literature were used for confirming

the diagnosis of periodontitis. For collection of GCF, area was isolated with cotton rolls and crevicular area was dried using an air syringe. GCF was collected by placing the filter paper strips into the sulcus for thirty seconds. Obtained samples were transported to the laboratory in sterile test tube where ELISA technique and auto-analyzer was used for evaluation of RANTES levels. All the results were recorded and analyzed by SPSS software. Student t test was used for evaluation of level of significance.

RESULTS

In the present study, a total of 25 patients with periodontitis and 25 healthy controls were enrolled. Mean age of the patients of the periodontitis group and the control group was found to be 46.8 years and 45.8 years respectively. There were 13 patients and 15 patients of more t than 40 years of age in group 1 and group 2 respectively. There were 13 males and 12 females in periodontitis group and 15 males and 10 females in the control group.

In the present study, mean RANTES levels of the patients of the periodontitis group and the control group was found to be 69.4 pg/µL and 13.4 pg/µL respectively. While comparing the mean RANTES levels of the patients of the periodontitis group and the control group, significant results were obtained.

Table 1: Demographic data

Parameter		Group 1	Group 2
Age group (years)	Less than 25	4	3
	25 to 40	8	7
	More than 40	13	15
Gender	Males	13	15
	Females	12	10

Table 2: Comparison of RANTES levels

RANTES levels	Group 1	Group 2	p-value
Mean (pg/µL)	69.4	13.4	0.00
SD (pg/µL)	27.5	4.8	(Significant)

DISCUSSION

Periodontal disease is an inflammatory process that affects the protective and supportive tissues around the tooth. Bacterial plaque accumulation on the tooth surface leads to marginal tissue inflammation, known as gingivitis. If left untreated, gingivitis may progress to periodontitis, which is characterized by loss of periodontal attachment support (clinical attachment loss, [CAL]) and bone resorption, eventually resulting in tooth mobility and loss. Chronic periodontitis is a common disease characterized by a painless, slow progression. It may occur in most age groups, but is most prevalent among adults and seniors worldwide.[6-8]

The activity of the chemokine RANTES is not restricted merely to chemotaxis. It is a powerful leukocyte activator, a feature potentially relevant in a range of inflammatory disorders. RANTES has attracted attention because it can potently suppress and, in some circumstances, enhance HIV replication. These characteristics are critically dependent on its ability to self-aggregate and bind to glycosaminoglycans.[9] Hence; the present study was undertaken for assessing the RANTES levels in GCF of patients with periodontitis.

In the present study, a total of 25 patients with periodontitis and 25 healthy controls were enrolled. Mean age of the patients of the periodontitis group and the control group was found to be 46.8 years and 45.8 years respectively. There were 13 patients and 15 patients of more t than 40 years of age in group 1 and group 2 respectively. There were 13 males and 12 females in periodontitis group and 15 males and 10 females in the control group. J Gamonal et al investigated the involvement of interleukin-1 beta (IL-1 beta), IL-8, and IL-10 and RANTES (regulated on activation, normally T cell expressed and secreted) and the cell populations associated with the immune response in destructive periodontitis, as well as the effect of periodontal therapy on cytokine levels in gingival crevicular fluid (GCF). Data were obtained from 12 patients with moderate to advanced periodontitis and 6 healthy controls. IL-1 beta levels were significantly higher in active sites versus inactive sites ($P < 0.05$). IL-8 and IL-10 and RANTES were increased in active sites; however, differences were not significant ($P > 0.05$). A positive correlation between the IL-8 and RANTES ($r = 0.677$, $P < 0.05$) was observed in periodontitis patients. These data suggested that the amount of crevicular IL-1 beta, IL-8, and IL-10 and RANTES is associated with periodontal status.[9]

In the present study, mean RANTES levels of the patients of the periodontitis group and the control group was found to be 69.4 pg/µL and 13.4 pg/µL respectively. While comparing the mean RANTES levels of the patients of the periodontitis group and the control group, significant results were obtained. Gülnur Emingil et al examined the gingival crevicular fluid (GCF) levels of MCP-1 and RANTES in patients with generalized aggressive periodontitis (G-AgP). MCP-1 and RANTES levels were investigated in GCF samples of 10 patients with G-AgP and 10 periodontally healthy subjects. Periodontal status was evaluated by measuring probing depth, clinical attachment loss, presence of bleeding on probing and plaque. In the G-AgP group, GCF samples were collected from the two approximal sites; from one single-rooted tooth and from one first molar tooth with > or =6 mm probing depth. In the healthy group, GCF samples were collected from one of the single-rooted teeth. GCF MCP-1 and RANTES levels were quantified by enzyme immunoassay. The G-AgP patients had significantly higher GCF MCP-1 and RANTES levels compared to the healthy group ($p < 0.05$). GCF MCP-1 and RANTES levels were positively correlated with both probing depth and clinical attachment loss ($p < 0.05$). There was no correlation between GCF MCP-1 and RANTES levels and the percentage of sites

with bleeding (p>0.05). The results suggested that MCP-1 and RANTES could play key roles in both activation and recruitment of inflammatory and immune cells in periodontal environment of G-AgP patients.[10] Subramani T et al assessed the mRNA expression of TNF-α and RANTES in healthy individual, chronic periodontitis and CsAinduced gingival overgrowth tissues. Gingival tissue samples were collected from chronic periodontitis, CsAinduced gingival overgrowth patients and healthy individuals. Total RNA was isolated and reverse transcription polymerase chain reaction (RT-PCR) was performed for TNF-α and RANTES expression. The results suggest that CsAinduced gingival overgrowth tissues expressed significantly increased TNF-α and RANTES compared to control and chronic periodontitis. The findings suggested that CsA can modify the expression of TNF-α and RANTES in drug-induced human gingival overgrowth.[11]

CONCLUSION

From the above results, the authors concluded that RANTES levels are significantly raised in periodontitis patients highlighting their role in the pathogenesis of the disease.

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