

# Comparison the Level of the IL-20 Cytokine in Gingival Crevicular Fluid in Periodontally Health and Periodontitis Patients

Dr. Maha Asaad Amin Munshi<sup>1</sup>, Dr. Mohammed Abdullah Batwa<sup>2</sup>,  
Dr. Abdullah Ahmed Ali Agilley<sup>3</sup>, Dr. Reem Ali Ayedh Alshamrani<sup>4</sup>

<sup>1</sup>Senior Register-Periodontics Ministry of Health- Jeddah-K.S. A

<sup>2</sup>Consultant-Periodontics Ministry of Health-Jeddah-K.S. A

<sup>3</sup>Resident- Saudi periodontics Board Ministry of Health-K.S. A

<sup>4</sup>General Dentist-Jeddah - K.S.A

Corresponding Author: Dr. Mohammed Abdullah Batwa

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## ABSTRACT

**Background:** Periodontitis refer to the inflammation of the tissues surrounding tooth structure. Multiple cytokines are involved in the pathogenesis of periodontitis.

**Objectives:** A comparison of the IL-20 level found in gingival crevicular fluid in healthy and periodontitis patients.

**Methods:** GCF samples were obtained from both patients systematic healthy with periodontitis and with healthy periodontium patients. The subjects included in this study were divided into two equal groups: group 1: included 10 patients with stage 3-4 periodontitis and group 2: included 10 periodontally healthy subjects. The GCF samples were collected. All samples were stored at -80°C till laboratory analysis. IL-20 levels were measured by ELISA.

**Results:** IL-20 levels were significantly higher in patients with Periodontitis compared with healthy periodontal patients (p-value  $\leq 0.05$ )

**Conclusions:** IL -20 play a role in Periodontitis patients.

**Key words:** IL-20, Periodontitis Patient, GCF

## INTRODUCTION

Periodontal diseases consist of a group of inflammatory conditions affecting the periodontium that are initiated by certain types of microorganisms and are mainly classified as gingivitis and periodontitis (Seymour GJ 1991).

Periodontitis define as an inflammation of the tissues surrounding the teeth. characterized by redness of the gingiva, gingival bleeding, gingival swelling, unlikely mouth smell, deep pocket depth and attachment loss of alveolar bone (Michael G. Newman et al, 2015). The major factor causing periodontitis dental plaque (Christopher J et al 2013) The

treatment for patient with periodontitis divide into non-surgical (including patient education and motivation, scaling and root planning) and surgical treatment. (O'leary TJ et al, 1972)

Periodontitis occurs due to the challenge between periodontal pathogens and the host immune defense. (Consolaro A et al 2013) Cytokines play a critical role in mediating the inflammatory processes and tissue homeostasis underlying periodontitis, and an exaggerated and disproportionate host immune response has been shown to be responsible for periodontal damage in infected patients. The adaptive immune response is mainly caused by the

involvement of various pro-inflammatory cytokines produced by activated T cells in diseased periodontal and periodontal tissues. T cells produce inflammatory cytokines that are predisposing factors in the symptoms and complications of periodontitis. (Hajishengallis G 2014) Cytokine's roles such as interleukin 1, IL6, IL8 in periodontitis and their involvement in periodontal tissue destruction has been evaluated. Now the attention is on the study of newly identified cytokines as IL20. IL-20 is a pro-inflammatory cytokine member of the IL-10 family can be produced by lipopolysaccharides, hypoxia or oxidized low density lipoprotein, IL-20 is a chemoattractant and angiogenesis factor (Chi-Chen Wei et al, 2006, Zhang JMet al, 2007; Moore K.W et al,2001 ; Rousset F et al, 1992 ; Thompson-Snipes L et al , 1991 ; Moore K.W et al,1990 and Go N.F et al 1990)

There are limited available studies about the level of IL-20 present in the GCF fluids among periodontally healthy patients and periodontally diseased patients. Thus the present study was designed to compare level of IL-20 in GCF of periodontitis patients and healthy periodontal patients.

### Aim of the study:

Evaluate the IL-20 level found in gingival crevicular fluid in healthy and periodontitis patients.

### METHODS

The patients on this study were selected from dental teaching hospital at Umm Al-Qura University-Makkah- KSA. The ethical approval got from the Institutional Review Board of the Faculty of Dentistry (IRB) at Umm Al-Qura University, and a written consent for participation in the study was obtained from the patients. Patients inclusion criteria: (healthy patient, age between 20-60 years old, periodontally diseased patients who have stage 3-4 periodontitis \* and non-smoker. Immunocompromised patients, Pregnant women, Smoking patients, gingivitis

/aggressive periodontitis pt/ mild chronic periodontitis patients, Patients on NSAID drugs and Patients receive periodontal therapy since 1 year were excluded from this study. The patients were divided into 2 equal groups: Group1: (10 patients with stage 3-4 periodontitis periodontitis ), and group 2: (10 periodontally healthy subjects ).

Full mouth probing depth (PD), Plaque index (O'leary TJ et al, 1972 and Ainamo, J. Bay I, 1975), clinical attachment level (CAL) (Ramfjord S et al, 1968) and bleeding on probing measured by using a Williams periodontal prop (Ainamo, J. Bay I, 1975).

### Samples collected:

GCF samples collected from periodontally diseased patients and periodontally health subjects

( upper posterior premolar teeth).

GCF samples: 5 micro  $\mu$ L samples of GCF collected by micropipette capillary tube, and the samples were placed in tube containing 300  $\mu$ L phosphate buffer solution as diluting solution

### STATISTICAL ANALYSIS

All samples are measured by use of enzyme-linked immunosorbent assays (ELISA) kit for selected cytokine [IL-20 (pg/ml)] levels.

Data were statistically analyzed using SPSS v.17. T-test. A p-value  $\leq 0.05$  was considered statistically significant.

### RESULTS

There was a statistical difference of IL-20 level between patients with periodontitis compered to healthy periodontally patients (p-value  $\leq 0.05$ )

Table 1. Evaluate the level of IL-20

Groups	IL-20 M $\pm$ SD	Comparison
Healthy	0.0 $\pm$ 0.0	Independent
Vs.	Vs.	T-Test:
Periodontitis patients	0.93 $\pm$ 1.534	T=2.712p=0.010

### DISCUSSION

IL-20 is a pro-inflammatory cytokine that plays a role against the inflammatory

diseases. Interleukin-20 is a cytokine with potent inflammatory, angiogenic, and chemoattractive effects, all of which are characteristics of psoriasis, rheumatoid arthritis, and atherosclerosis. The previous involved diseases are characterized by the inflammatory status similar to periodontitis that also characterized by inflammatory angiogenic effect. The findings of the present study indicated that, there is a statistically significant in the level of the IL-20 when comparing patients with periodontitis to healthy periodontal patients. This finding is similar to study by Wang Zuomin et al 2010, they reported that serum levels of IL-20 were significantly increased in patients with moderate and severe periodontitis than those of their respective controls.

## CONCLUSIONS

IL-20 play a role in Periodontitis patients. We recommend further research to discover thereasons behind our findings.

### Declaration by Authors

**Ethical Approval:** Approved

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