Evaluation of Interleukin-6, Matrix Metalloproteinase-8 and Osteoprotegerin levels in both Chronic and Aggressive Periodontitis patients

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Faculty of Dentistry
Ain Shams University

By

Manal Salem Bazina

Demonstrator, Department of Periodontology, Faculty of Dentistry, Benghazi University. Libya
B.D.S . (2005)

Faculty of Dentistry
Ain Shams University
2014

Supervised By

Prof.Dr. Hadir Fouad El Dessouky

Professor of Oral Medicine, Periodontology, and Oral Diagnosis
Department of Oral Medicine, Periodontology, Oral Diagnosis and Radiology

Faculty of Dentistry
Ain Shams University

Dr. Ahmed Abdel Aziz Hassan

Lecturer of Oral Medicine, Periodontology, and Oral Diagnosis
Department of Oral Medicine, Periodontology, Oral Diagnosis and Radiology

Faculty of Dentistry
Ain Shams University

Prof.Dr. Ola Ibrahim Ahmed

Professor of Medical Microbiology & Immunology
Department of Medical Microbiology & Immunology
Faculty of Medicine
Ain Shams University

تقييم مستوى كل من الأنترلوكين-٦ والماتريكس ميتاللوبروتينيز-٨ والأستيوبروتجرين في مرضى التهاب الأنسجة الداعمة حول السنية المـــزمن والهجومـــــي

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منـــــــال سالم بازينـــــــة

معيدة بقسم علاج اللثة, كلية طب وجراحة الفم و الأسنان جامعة بنغازي

بكالوريوس طب الأسنان , بنغازي – ليبيا

2005

كلية طب الأسنان
جامعة عين شمس
2014

تحت أشـــــــــراف

أ.د. هــدير فـــــؤاد الدســوقي

استاذ بقسم طب الفم ,علاج اللثة ,التشخيص,والاشعة
كـلية طب الاسنان – جامعة عيـن شمـس

د. أحمـــــد عبد العـــزيز حسن

مدرس بقسم طب الفم ,علاج اللثة ,التشخيص, والاشعة
كـلية طب الاسنان – جامعة عيـن شمـس

أ.د. عـــــــلا ابراهـيم أحمد

استاذ بقسم الميكروبيولوجي و المناعة
كلية الطب- جامعة عين شمس

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DEDICATION

To the soul of my father who taught me the value of learning.

To the person I admire most, my mother who offered me unconditioned support throughout the course of my life.

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Contents

List of Abbreviations

AAP	American Academy Of Periodontology
Aa	Aggregatibacter actimomycetemcomitans
AgP	Aggressive periodontitis
CAL	Clinical Attachment Level
CP	Chronic periodontitis
CRP	C-reactive protein
ECM	Extracellular matrix
ELISA	enzyme-linked immunosorbent assay
GAgP	Generalized aggressive periodontitis
GCF	Gingival crevicular fluid
HbA1c	Hemoglobin A1C
IFN	Interferon
Ig	Immunoglobulin
IL-6	Interleukin-6
IL- 1Ra	IL-1 receptor antagonist
LPS	Lipopolysaccharides
MMPs	Matrix metalloproteinases
MPO	Myeloperoxidase
OPG	Osteoprotegerin
OSM	Oncoststin M
PBI	Papillary Bleeding Index

PD	Periodontal disease
PDL	Periodontal ligament
Pg	Porphromonas gingivalis
PG	Prostaglandins
PI	Plaque index
PMNs	Polymorphonuclear granylocytes
PPD	Probing pocket depth
RANKL	Receptor activator of nuclear factor kappa B ligand
SDD	Subantimicrobial-dose doxycycline
TGF-β	Transforming growth factor-β
Th1	T- helper type 1
TIMP	Tissue inhibitors of matrix metalloproteinases
TNF	Tumor necrosis factor
TNF-α	Tumor necrosis factor-α
T2DM	Type 2 diabetes mellitus
UWS	Unstimulated whole saliva

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INTRODUCTION

Periodontal disease (PD) is a chronic bacterial infection characterized by persistent inflammation, connective tissue breakown and alveolar bone destruction. Contributing inflammatory mediators and tissue destructive molecules have been detected in the gingival tissue, gingival crevicular fluid (GCF) and saliva of patients affected by periodontitis.[(1)]

Chronic periodontitis (CP) is characterized by the occurrence of an irreversible destruction of periodontal supporting tissues. Disease appears to result from a complex interaction between the periodontopathogenic bacteria and the host immunoinflammatory response. Periodontal loss is considered to occur as cycles of acute-activity episodes that alternate with prolonged periods of quiescence.[(2)] The disease progression involves a network of interacting molecular pathways including proinflammatory mediators, reactive oxygen species, matrix metalloproteinases (MMPs), and their MMP inhibitors and regulators.[(3)] Type I collagen is the main extracellular matrix component of periodontal tissues, and

thus, collagen degradation is regarded as one of the key factors in uncontrolled destructive lesions.[4]

Aggressive periodontitis (AgP) is characterized by a rapid loss of clinical attachment and alveolar bone and normally affects young adults. As opposed to chronic periodontitis, the amount of biofilm and calculus accumulation in aggressive periodontitis subjects is inconsistent with the severity and progression of the periodontal destruction. It is subdivided into localized and generalized form, according to the extent of the periodontal destruction. Diagnosis of aggressive periodontitis requires exclusion of the presence of systemic diseases that may severely impair host defenses and lead to premature tooth loss.[5,6]

Interleukin-6 (IL-6) is an important cytokine involved in the regulation of host response to tissue injury and infection .[7] It is produced by a variety of cells, such as monocytes, fibroblasts , osteoblasts and vascular endothelial cells in response to inflammatory challenges . It plays an important role in B-cell differentiation and in T-cell proliferation , while IL-6, synergistic with