

***Gingival crevicular fluid levels of monocyte
chemoattractant protein-1 in chronic and
aggressive periodontitis before and after
treatment***

Thesis

***Submitted to the Faculty of Oral and Dental Medicine
Cairo University***

***In partial fulfillment of the requirements of master degree in Oral
medicine, oral diagnosis and periodontology***

By

Radwa Mohamed Ismail

B.D.S (2005)

Oral medicine, Oral diagnosis and Periodontology

***Faculty of Oral and Dental Medicine
Cairo University***

2013

Supervisors

Professor Doctor

Mahmoud Ibrahim Elrefaey

Professor of Oral medicine, oral diagnosis and Periodontology

Faculty of Oral and Dental Medicine

Cairo University

Professor Doctor

Olfat Gameel Shaker

Professor of Biochemistry

Faculty of Medicine

Cairo University

Professor Doctor

Riham Omar Ibrahim

Associate Professor of Oral medicine, oral diagnosis and

Periodontology

Faculty of Oral and Dental Medicine

Cairo University

ACKNOWLEDGMENTS

First of all, I would like to thank God most gracious for showering me with his blessings, his numerous gifts and for being my support throughout my whole life.

My deepest gratitude and sincere appreciation to Prof. Dr. Mahmoud Ibrahim Elrefaey, Professor of Oral medicine and Periodontology, Faculty of Oral and Dental Medicine, Cairo University, for his kind supervision, sincere help, understanding and modesty.

My deepest gratitude and thanks to Prof. Dr. Olfat Gameel Shaker, Professor of Biochemistry, Faculty of Medicine, Cairo University, for her sincere co-operation and kind supports

I am greatly indebted and extremely grateful to Associate Prof. Dr. Riham Omar Ibrahim, Associate Professor of Oral medicine and Periodontology, Faculty of Oral and Dental Medicine, Cairo University, for her unlimited effort, constructive criticism, and generous assistance in accomplishing this work.

This work is dedicated to...

My dear father and mother.....

My beloved husband...

My precious daughter Salma.....

My sister and brothers.....

You have brought unimaginable joy to my life.

TABLE OF CONTENTS

INTRODUCTION AND REVIEW OF LITERATURE.....	1-33
AIM OF THE STUDY.....	34
PATIENTS AND METHODS.....	35-48
RESULTS.....	49-67
CASES PRESENTATION.....	68-70
DISCUSSION.....	72-80
SUMMARY.....	81-82
CONCLUSION.....	83
REFERENCES.....	84-100
ARABIC SUMMARY.....	

List of abbreviations

Abbreviation	Name
AgP	Aggressive periodontitis patients
CP	Chronic periodontitis patient
PPD	Pocket depth
CAL	Clinical attachment loss
GI	Gingival index
PI	Plaque index
PGE2	Prostaglandin E2
MCP-1	Monocyte chemoattractant protein-1
KD	Kilo Dalton
ELISA	Enzyme Linked Immunosorbent Assay
GCF	Gingival crevicular fluid
IL-1	Interleukin-1
MMP	Matrix metalloproteinase
TNF-α	Tumor necrosis factor alpha
LPS	Lipopolysaccharide
GPCRs	seven-transmembrane G-protein coupled receptors
CCRs	Chemokine receptors
CCL2	Chemokine ligand
IL-1β	Interleukin-1 β
IL-4	Interleukin-4
TH2	T-helper2
SNPs	single nucleotide polymorphisms
HIV	Human immunodeficiency virus
DNA	Deoxyribonucleic acid
SRP	Scaling and root planning

Abbreviation	Name
MIP-1β	macrophage inflammatory proteins-1 β
MDC	monocyte derived chemokine
MIP-1α	macrophage inflammatory proteins-1 α
IL-12p70	Interleukin- 12p70
VEGF	Vasular endothelial growth factor
IL-8	Interleukin 8
IP-10	Inducible protein-10
IL-10	Interleukin-10
IFN-γ	Interferon- gamma
IL-8	Interleukin 8
IgG2	Immunoglobulin G2
TRAP	Tartrate-resistant acid phosphatase

List of Figures

Number of figures	
1	Sample collection
2	sample collected in Eppendorf vials
3	calibrated Elisa reader machine
4	Elisa kit
5	Reagent preparation
6	Human MCP-1 concentration (PG/ML)
7	mean ages values in the three groups
8	Mean GI values in the three groups
9	Changes after treatment in GI values in chronic and aggressive periodontitis groups
10	Mean % decrease in GI values in chronic and aggressive periodontitis groups
11	Mean PI values in the three groups
12	Changes after treatment in PI values in chronic and aggressive periodontitis groups

13	Mean % decrease in PI values in chronic and aggressive periodontitis groups
14	Mean PD values in chronic and aggressive periodontitis groups
15	Changes after treatment in PD values in chronic and aggressive periodontitis groups
16	Mean % decrease in PD values in chronic and aggressive periodontitis groups
17	Mean CAL values in chronic and aggressive periodontitis groups
18	Changes after treatment in CAL values in chronic and aggressive periodontitis groups
19	Mean % decrease in CAL values in chronic and aggressive periodontitis groups
20	Mean MCP-1 values in the three groups
21	Changes after treatment in MCP-1 values in chronic and aggressive periodontitis groups
22	Mean % decrease in MCP-1 values in chronic and aggressive periodontitis groups
23	Scatter diagram representing positive correlation between GI and MCP-1 values before treatment
24	Scatter diagram representing positive correlation between PD and MCP-1 values after treatment
25	Scatter diagram representing positive correlation between CAL and MCP-1 values after treatment

26	Periapical x-ray of chronic periodontitis case
27	Pocket depth of 5 mm in chronic periodontitis case before treatment
28	Pocket depth of 3 mm in chronic periodontitis case after treatment
29	Periapical x-ray of aggressive periodontitis case
30	Pocket depth of 5 mm in aggressive periodontitis case before treatment
31	Pocket depth of 4 mm in aggressive periodontitis case after treatment

List of tables

Number of table	
1	Materials provided
2	the mean standard deviation (SD) values and results of ANOVA test for the comparisons between ages in the three groups
3	The mean, standard deviation (SD) values and results of Kruskal-Wallis test for the comparison between GI in the three groups
4	The mean, standard deviation (SD) values and results of Wilcoxon signed-rank test for the changes after treatment in chronic and aggressive periodontitis groups
5	The mean %, standard deviation (SD) values and results of Mann-Whitney U test for the comparison between % decreases in GI in the two groups
6	The mean, standard deviation (SD) values and results of Kruskal-Wallis test for the comparison between PI in the three groups
7	The mean, standard deviation (SD) values and results of Wilcoxon signed-rank test for the changes after treatment in chronic and aggressive periodontitis groups
8	The mean %, standard deviation (SD) values and results of Mann-Whitney U test for the comparison between % decrease in PI in the two groups

9	The mean, standard deviation (SD) values and results of Student's t-test for the comparison between chronic and aggressive periodontitis groups
10	The mean, standard deviation (SD) values and results of paired t-test for the changes after treatment in chronic and aggressive periodontitis groups
11	The mean %, standard deviation (SD) values and results of Mann-Whitney U test for the comparison between % decrease in PD in the two groups
12	The mean, standard deviation (SD) values and results of Student's t-test for the comparison between chronic and aggressive periodontitis groups
13	The mean, standard deviation (SD) values and results of paired t-test for the changes after treatment in chronic and aggressive periodontitis groups
14	The mean %, standard deviation (SD) values and results of Mann-Whitney U test for the comparison between % decrease in CAL in the two groups
15	The mean, standard deviation (SD) values and results of ANOVA test for the comparison between MCP-1 in the three groups
16	The mean, standard deviation (SD) values and results of paired t-test for the changes after treatment in chronic and aggressive periodontitis groups
17	The mean %, standard deviation (SD) values and results of Student's t-test for the comparison between % decreases in MCP-1 in the two groups

18	Results of Pearson's correlation coefficient for the correlation between MCP-1 before treatment and different parameters
19	Results of Pearson's correlation coefficient for the correlation between MCP-1 after treatment and different parameters

INTRODUCTION AND REVIEW OF
LITERATURE

INTRODUCTION AND REVIEW OF LITERATURE

Periodontal diseases are the most common dental conditions; it is a bacterial-induced chronic inflammatory disease affecting soft and hard supporting structures encompassing the teeth. It is characterized by loss of connective tissue attachment around the teeth with the formation of periodontal pockets due to apical migration of the junctional epithelium. When left untreated, the ultimate outcome is alveolar bone loss and exfoliation of the involved teeth (**Armitage, 2008**). Periodontitis is a nonreversible form of periodontal disease and it represents the destructive category of periodontal disease (**Offenbacher, 1996**).

Periodontal disease is not a continuous process but it is characterized by episodes of activity and episode of relative quiescence (**Silva et al, 2008**).

Periodontitis is classified into chronic periodontitis (localized and generalized), aggressive periodontitis (localized and generalized), and periodontitis as a manifestation of systemic disease, necrotizing ulcerative periodontitis, abscesses of periodontium, and combined periodontic-endodontic lesions (**Armitage, 1999**). Other classification are made by **Picolas et al in 2005** stated that there are two main forms of destructive periodontal disease, chronic and aggressive periodontitis.