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Serum interleukin 1-βlevels among salivary secretary ABO blood group chronic periodontitis subjects

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Abstract:
Introduction: *Periodontal disease is defined as inflammatory destruction of periodontal tissue and alveolar bone supporting the teeth. The key role for inflammation in periodontitis is interleukins; the important one is IL-1β. Limited efforts have been made to inspect the association between periodontal disease and secretor status ABO blood group. The aim of this study was to show if there is any relationship between secretors ABO group and IL-1B in chronic periodontitis subjects in comparison to control.*
Materials and methods: *the saliva and serum were collected from 21patients with chronic periodontitis in comparison to 18 healthy subjects with the average age about 35-55 years for both groups. Clinical periodontal parameters (PLI, GI and BOP) for both studied groups were taken and probing pocket depth (PPD) for only chronic periodontitis group. Determination of serum IL-1β level was done by ELISA. The secretary ABO blood group from saliva by using Blood Typing Kit # 11.*
Results: *The means of all clinical periodontal parameters were higher in chronic periodontitis group. While the mean for periodontal pocket depth was (4.9 ±1.36).The results show non significance difference between chronic periodontitis and control group for O secretary blood group in mean concentration of serum IL-1β and significance difference for A secretary blood group while for the B secretary blood group it was highly significance. There were no statistical differences for AB secretary blood group because there was only one subject from chronic periodontitis AB secretary blood group*
Conclusion: *the concentration of serum interleukin 1-β in chronic periodontitis differs according to secretary status ABO blood group and this play a role in the extent of the severity of periodontal disease.*
Key words: *ABO blood group, serum interleukin 1-β,chronic periodontal disease.*

I. Introduction

Periodontal disease, a chronic infectious inflammatory disease described by the destruction of the tooth- supportive structures. It is originated by the multifaceted micro biota found as dental plaque, a complex microbial biofilm, and tissue damage is mainly facilitated by an atypical host response to specific bacteria and their products [(1)].The ABO antigens system is an important part and is considered as an image to the overall health state that indicates many systemic variations in the human body [(2).]Saliva has been broadly studied relative to periodontal disease as it is simply collected and permits analysis of a number of local or systemic biological indicators[(3).]There is indication that the personal reaction to the environment and changes in the immune response in periodontitis are concomitant with genetic factors. As stated by Michalowicz et al., [(4)] chronic periodontitis is related with heredity in 50% of subjects. The search for applicant genes to determine gene polymorphism concentrated on the cytokine network due to their verified role in periodontitis. Cytokines have Proinflammatory role like interleukin-1 (IL-1) which is considered a key mediator of the inflammation and has been studied broadly as it is a more powerful inducer of bone resorption[(5)].

The presence of antigen of ABO system is an important part on the membrane of red blood cell, which are similarly located in plasma and other body fluids. The occurrence or absence of individual antigens has been correlated with numerous diseases and abnormalities, and the antigens also acting as receptors for infectious mediators [(6)].

Limited efforts have been made to examine the relationship between ABO blood group and periodontal disease. The greater part of the researchers[(7,8)] have demanded that different ABO blood groups comprise an enlarged risk for the development of oral and periodontal diseases; while one study[(9)] failed to discover such an correlation. But there is no study shows the relationship between interleukin -1B with secretary blood groups in chronic periodontitis patients. So the aim of this study was to show if there is any relationship between secretary ABO group and IL-1B in chronic periodontitis subjects in comparison to control.

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II. Materials And Methods

Samples

Thirty nine persons (male and female) were obtained from Department of Periodontics in the Collage of Dentistry, University of Baghdad. The study samples included twenty one persons with chronic periodontitis. Eighteen with clinically healthy periodontium. All subject with an age range from (35-55) year's old and with no history for any systemic disease. Consent was taken from each subject

Collection the saliva

Five ml unstimulated saliva samples of the two groups were collected. Collection of saliva was including their agreement to enroll the study and it was performed 2-3 hours after the volunteer usual breakfast time and after thoroughly rinsing the mouth with water. Saliva was collected by standard drooling method then saliva collected in a plane tube, centrifuged 5 minutes at 4000 rpm, The clear supernatant was separated by micropipette be stored in plane tubes at (-20 C̊) till being assessed.

Collection the serum

Five ml of venous blood were drawn from all subjects. Blood samples were collected in serum separating tubes (SSTs) contain the clot activator and special gel at the base. After centrifugation for 15 minutes at 1000 rpm the separation serum samples kept at -20 till used.

Clinical examination

The following parameters were taken plaque index (PLI) [(10)], gingival index (GI) [(11)], bleeding on probing (BOP) [(12)] and probing pocket depth (PPD) [(13)].

Detection of serum interleukin 1-β

The presence of cytokine in the serum samples was determined by using commercial enzyme linked immune sorbent assay kits. The kits detected human IL-1β. (Serum IL1-β, CUSABIO kit, China) Concentrations of the cytokine in serum measured in (pg/µl.).

Detection of ABO salivary secretors

Blood Typing Kit # 11: Blood Typing Using Saliva Student Manual by the following steps

1- Expectorate several milliliters of saliva into a small beaker.
2- Stand the tube upright in a test tube rack in a boiling water path for ten minutes to denature both salivary as well as the bacterial enzymes.
3- Centrifuge the test tube for several minutes to sediment any coarse precipitate. Use only supernatant fluid for this study.
4- Place six test tubes in arrow of a test tube rack. Label the tube as follows: C, 2, 4, 8, 16, 32. C refers to control tube, to which no saliva will be added.
5- Using a clean pasture pipette, (or micropipette) to place one drop of saliva into the tube labeled 2. Place one drop of saline into each of six tubes. Titer (dilute) the saliva in tube 2 by mixing it with the saline in the tube and then drawing the contents in the pipette.
6- Expel one drop into the next test tube (test tube 4) and then return the remaining liquid in the pipette to test tube 2.
7- Draw the contents of test tube 4 into the pipette and expel one drop into the test tube 8. Return the remaining liquid to test tube 4. Continue this procedure from one tube to the next.
8- Finally, remove one drop from the tube 32 and discard it. Return the remaining saline-saliva mixture liquid to test tube 32.
9- Add one drop of anti-A serum to each test tube. Shake each tube and let them stand them stand undisturbed for ten to fifteen minutes. Then add one drop of the suspension of group a red blood cells to each tube, let the tubes stand to for five minutes and then centrifuge them at high speed (about 3500 rpm) for 20 seconds. Inspect he tubes for the presence or absence of red blood cell clumping.

(Repeat the same procedure for anti-B serum and group B red cell and for the anti-H serum and group O red cell)

III. Results

The summary descriptive of clinical periodontal parameters (PLI, GI and BOP) for studied groups with their statistical results shown in (table 1). PLI, GI and BOP for each group were found to be higher in chronic periodontitis group than in control group. While the mean for periodontal pocket depth was (4.9 ±1.36).

Table 2 revealed the distribution of ABO blood group, and mean concentration of serum IL-1β for each group with statistical differences. The results show non significance difference between chronic periodontitis and control group for O secretary blood group in mean concentration of serum IL-1β and significance difference for a secretary blood group while for the B secretary blood group it was highly significance. There were no statistical differences for AB secretary blood group because there was only one subject from chronic periodontitis and not found in control group.

Table 3. Correlation between cons. of IL-1β for each ABO blood group with their clinical parameters (PLI, GI and BOP) for studied groups. This table revealed a highly significance correlation PI andIL-1Bconcentration for the chronic periodontitis group while the correlation for GI and BOP it was non-significance on the other hand for the control group the correlation was only a highly significance for the BOP withIL-1Bconcentration and a non-significance correlation for the PI and GI as shown in table 3.

Table 4. Present the correlation of IL-1β cons. with probing pocket depth/ ABO blood group for chronic periodontitis group. It was appear that a non-significance correlation exist between IL-1Bconcentration and periodontal pocket depth for both A, O secretary ABO group.

IV. Discussion

Blood group factors in body fluids are of medico-legal importance in detections method**s.** Many other workers [(14, 15, and 16)] have studied and confirmed the presence of ABO blood group agglutinins in saliva. Only limited studies have examined the relationship between Secretary ABO blood group and periodontal disease. The results of the present study have shown that there was a non-significant difference in the concentration of serum IL-1β in O secretary blood group, this result agree with Rawlinson et al. ,2003[(17)] who reported lower concentrations of IL-1β at diseased sites in comparison with healthy sites. These results revealed that the parsons with secretary O blood group may be with less severity to chronic periodontitis. In contrast to Gawrzewska [(18)]who establish that individuals with blood group O have more severity of periodontal disease.

The results for the other secretary blood group revealed significance difference for A secretary blood group while for the B secretary blood group it was highly significance, this results agree with Kaslick et al[(19)]who found that patients with periodontitis were further possible to have A or B blood groups. The sample sizes in this study were small and the results cannot be generalized. Frias and Lopez [(20)]settled that there is no association between secretor status of ABO blood group and juvenile periodontitis.

There was non-significant correlation between clinical parameters (GI, BOP) and serum IL-1β concentrations in the present study. But there was highly significance with PI in opposite to control group. While for the PPD there was non-significance in O and A secretary blood group with the concentration of serum IL-1β and these results in contrast to Rchna et al [(21)] who concluded that there were significant correlations between IL-1β levels and all clinical parameters.

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Table 1. Summary Descriptive of clinical periodontal parameters for studied groups

	Clinical periodontal parameters			
Groups	Plaque Index (PI) (Mean ± SD)	Gingival Index(GI) (Mean ± SD)	Bleeding on probing (BOP) (Mean ± SD)	Probing pocket depth(PPD) (Mean ± SD)
Chronic Periodontitis	1.16 ± 0.33	1.19 ± 0.36	36.6 ± 17.8	4.9 ±1.36
Control	0.57±0.17	0.54±0.11	13.8 ± 12.2	_

Table 2.Distribution of ABO blood group, and mean concentration of serum IL-1β for each group with statistical differences

ABO Blood group	**IL-1β Chronic periodontitis**	**IL-1β Control**	**t-test**	**Sig.**	
Group O	n= 13 Cons= 184.7 ± 26.3	n= 13 Cons= 188.8 ± 33.3	0.427	0.677	NS
Group A	n= 6 Cons= 212.3 ± 26.6	n= 3 Cons= 189 ± 29.4	-1.062	0.337	S
Group B	n= 1 Cons= 235	n= 2 Cons= 181 ± 25.2	-5.250	0.003	HS
Group AB	n= 1 Cons= 192	n= 0	-	-	-

Table3. Correlation between cons. of IL-1β for each ABO blood group with their clinical parameters for studied groups

Clinical parameters	IL-1β Chronic periodontitis group	IL-1β Control group
PI	r= - 0.408 Sig= 0.074	r=0.388 Sig= 0.111
GI	r= 0.047 Sig= 0.843	r= 0.530 Sig= 0.029
BOP	r= 0.026 Sig= 0.914	r= 0.554 Sig= 0.017

Table4. Correlation of IL-1β cons. with probing pocket depth/ ABO blood group with for chronic periodontitis group

ABO Blood group	IL-1β concentration	PPD	R	Sig.
Group O	184. 69 ± 26.31	5.01 ± 1.46	0.306	0.309
Group A	214.4 ± 29.21	4.81 ± 1.39	-0.554	0.333
Group B	235	4.2	_	_
Group AB	192	4	_	_