

***Effect Of Orthodontic Tooth Movement On Salivary
Levels Of Interleukin-1Beta, Tumor Necrosis Factor-
alpha, and C- Reactive Protein***

***A Thesis Submitted to the Council of the College of
Dentistry at the University of Baghdad, in partial
fulfillment of the requirements for the Degree of
Master of Science in Orthodontic***

by
Noor Saadi Hasan
B.D.S

Supervised by
Professor Dr. Nidhal H. Ghaib
B.D.S., MSc.

Baghdad - Iraq

October 2013 A.D

Thu AL-Hijja 1434 A.H.

ABSTRACT

Background: Orthodontic force is considered to stimulate cells in the periodontium to release many mediators such as cytokines which play a responsible role for periodontal and alveolar bone remodeling, bone resorption and new bone deposition.

Aim of study: The present study was carried out to estimate changes of the (interleukin-one beta, tumor necrosis factor – alpha and c- reactive protein) levels in unstimulated whole saliva during the leveling stage of orthodontic tooth movement.

Materials and methods: The study group consisted of thirty adult patients including (12 males) and (18 females) individuals with ages ranges (19-23) years that were conformable the criteria of the study. Each sample had Class I and Class II malocclusion dental classification and required bilateral extraction of their maxillary first premolars, underwent a session of professional oral hygiene and received oral hygiene instructions before and during the period of study, one month later fixed orthodontic appliance were placed in the upper arch by using 0.014 nickel titanium arch wire. The unstimulated whole saliva was taken from each sample immediately before placement of the appliance (baseline), and at (after 1 hour, after one week and after two week) following placement of the fixed orthodontic appliance. In addition the plaque index and gingival index were recorded during the interval periods of this study to assess oral cleanliness. The interleukin – one beta and tumor necrosis factor-alpha were determined by enzyme linked immunosorbent assay, while the C-reactive protein was determined by latex agglutination.

Results: The results of the present study found the mean value of both salivary (interleukin-one beta and tumor necrosis factor -alpha) were highest at (after 1 hour) followed by at (after one week) then at (after two week) than the baseline with

highly statistical significant differences ($P < 0.01$) among males, females and total samples, in addition there were no statistical significant differences between males and females ($P > 0.05$).

While the mean values of C-reactive protein were higher at (after 1hour) only with highly significant differences ($P < 0.01$) among females and total samples while only significant difference ($P < 0.05$) for males, in addition there were no statistical significant differences between males and females.

Regarding the correlation between salivary (interleukin – one beta and tumor necrosis factor -alpha), there were positive correlation between them at all periods of study. Moreover there were positive correlation between salivary (interleukin – one beta and tumor necrosis factor -alpha) and salivary C-reactive protein.

On the other hand there were no association between the salivary (interleukin – one beta and tumor necrosis factor -alpha and C-reactive protein) and clinical parameter (plaque index and gingival index).

Conclusion: From this clinical study we conclude that orthodontic force induces increasing the levels of (interleukin – one beta, tumor necrosis factor -alpha, C-reactive protein) in unstimulated whole saliva during orthodontic tooth movement.