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Evaluation of the Systemic Inflammatory Marker C-Reactive Protein in Blood of Patients Submitted to Minor Oral Surgical Procedures

A Thesis

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Abstract

Background:

C-reactive protein (CRP) is an acute phase protein that its plasma levels increase after trauma or surgery under the influence of interleukins and other cytokines that cause increase in its hepatic production and this increase is related to the degree of inflammation so it is used as an indicator for the level of inflammation after surgical procedures.

Objectives:

To investigate the pre- and postoperative levels of CRP in three types of oral surgical interventions (Apicoectomy, Impaction, and Crown Exposure) and to evaluate the level of inflammation after these procedures to predict the degree of the postoperative complication and the need of anti-inflammatory medication.

Materials and Methods:

This study was conducted from November 2014 to March 2015 at the department of oral and maxillofacial surgery, College of Dentistry, University of Baghdad. It based on clinical, laboratory and radiographical data.

The study was performed on (40) healthy individuals aged (20-40) years, (21) male & (19) female who need oral surgical intervention for either (surgical removal of impacted mandibular third molars, surgical exposure of impacted maxillary canine, or Apicoectomy for maxillary incisor tooth).

The surgical techniques were done under local anesthesia that was done by inferior dental block technique (for impaction) and infiltration technique (for Apicoectomy and Exposure) using two carpules (if needed) of Lidocaine hydrochloride 2% local anesthetic 2.2 ml with adrenaline 1:80000.

A 4ml venous blood was harvested from each patient at two occasions, preoperatively at the day of operation (which is considered as day0 in this study) and postoperatively after 48 hours (which is considered as day2 in this study),

then centrifuged for 15 minutes at (1000x gravity) and finally the sera were separated and stored at (-20^{o}c) to be used for later analysis by Enzyme Linked Immuno Sorbent Assay (ELISA) for the quantitative determination of high sensitive CRP in human serum. The laboratory tests were done at the Teaching Laboratories unit of Baghdad Medical city.

For each patient, pain and swelling were recorded in the postoperative period using Simple Descriptive Scale for pain (for 7 days postoperatively) and Visual Analog Scale for swelling (after 48hrs and 7th day postoperatively). And the time of the surgical procedure was recorded from the starting of the incision to the finishing of the flap suturing.

Results:

Results showed that there was statistically high significant increase in the level of CRP after oral surgical interventions in all types of operations (the CRP mean values preoperatively at the day of operation was 2.40 mg/L, postoperatively after 48hrs was 8.48 mg/L, and the P-value was 0.00).

Results also showed that there was a high significant difference among Apicoectomy, Impaction, and Exposure operations in the level of CRP at 48hrs postoperatively (P-value was 0.00).

The statistical analysis showed that there was no significant relationship between the level of pain intensity and the level of CRP after 48hrs from operation (P-value= 0.47) but the intensity of the postoperative pain after oral surgical intervention were highest in the day of operation with the highest level of pain intensity was recorded in Apicoectomy group (mean value was 2.73) and the lowest level was recorded in Exposure group (mean value was 1.33).

The statistical analysis showed that there was a significant correlation between the swelling after 48hrs from surgery and the level of CRP in all types of operations (P-value = 0.03).

The results showed that there was high significant relationship between the time of operation and the level of CRP after 48hrs from surgery (P-value=0.00).

Conclusion:

it is concluded that an inflammatory process develops after minor oral surgical interventions which necessitate the use of anti-inflammatory agents after these procedures and that the severity of inflammation measured by means of CRP levels is correlated to the degree of postoperative swelling, the length, and type of the surgical procedure.