



**COMPARISON OF THE EFFECTS OF IBUPROFEN
(A CONVENTIONAL NON STEROIDAL
ANTI-INFLAMMATORY DRUG) AND ACETAMINOPHEN ON
THE LEVELS OF PGE₂ IN THE GCF DURING ORTHODONTIC
TOOTH MOVEMENT- AN IN VIVO STUDY**

By

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Abstract

Background and objectives: Pain is among the most cited negative effects of orthodontic treatment. Non Steroidal Anti-Inflammatory Drugs (NSAIDs) seem to be an effective option for minimizing the discomfort caused by appliance activation. The concern with NSAIDs is that they can have adverse effects on tooth movement owing to their ability to block prostaglandin synthesis. Acetaminophen has been suggested as the analgesic of choice for relieving the pain associated with orthodontic treatment, as it showed no effect on orthodontic tooth movement in previous animal studies. The purpose of this study was to compare the effects of ibuprofen and acetaminophen on the PGE₂ levels of the GCF during orthodontic tooth movement in human subjects.

Method: A total of 42 patients (mean age: 18 ± 4.5 yrs) were randomly divided into three equal groups. In all patients, the maxillary canines were distalized with 150 g of force delivered by nickel titanium coil springs between the maxillary molars and canines. The first group was prescribed with ibuprofen, second with acetaminophen. The third group was used as control. GCF samples were obtained from the gingival crevicular sulcus of the maxillary canine using micropipettes before the activation of the closed coil springs (T₀) and after the activation of the closed coil springs at 24(T₁), 48(T₂) and 168 (T₃) hours. The quantitative PGE₂ content of the crevicular fluid was determined using enzyme linked immunosorbent assay. Intra-group differences of the PGE₂ levels in the GCF between different time periods were evaluated by the *Wilcoxon matched pairs test*. Inter-group differences of the PGE₂ levels at the different time periods were determined by the *Kruskal Wallis ANOVA test* and the *Mann-Whitney U test*.

Results: PGE₂ levels in all the experimental groups increased significantly by 24 and 48 hours of orthodontic force application and decreased to baseline levels by 168 hours. No statistically significant difference was found between the PGE₂ levels in the acetaminophen and control groups at any time point. There was a statistically significant decrease in PGE₂ levels in the ibuprofen group at 24 and 48 hrs when compared to the other two groups.

Conclusions: Results obtained from this study indicate that NSAIDs like ibuprofen have an inhibitory effect on synthesis of prostaglandins tooth movement and thereby may cause an impediment in the rate of tooth movement. Acetaminophen showed no significant effect on prostaglandin synthesis and may be the safe choice for relieving the pain associated with orthodontic treatment.

Key words: NSAIDs, ibuprofen, acetaminophen, pain, GCF, PGE₂