Republic of Iraq

Ministry of Higher Education

and Scientific Research

University of Baghdad

College of Dentistry

EFFICACY OF ANALGESICS ON PAIN PERCEPTION AND RATE OF TEETH ALIGNMENT (A RANDOMIZED CLINICAL TRIAL)

A thesis submitted to the council of the College of Dentistry/ University of Baghdad in partial fulfillment of the requirement for the degree of *Doctor of Philosophy* in *Orthodontics*

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February 2022 *Rajab 1443*

ABSTRACT

Background: Pain is one of the most reported side effects of orthodontic treatment despite the advanced technology in orthodontics. Many analgesics have been introduced to control orthodontic pain including acetaminophen and selective and nonselective nonsteroidal anti-inflammatory drugs. The great concern about these drugs is their adverse effect on rate of teeth alignment.

Aim of study: The purpose of this study was to evaluate and compare the effect of acetaminophen, ibuprofen and etoricoxib on pain perception and levels of receptor activator of nuclear factor kappa- β ligand (RANKL), osteoprotegerin (OPG), prostaglandin E_2 (PGE_2) and leptin in gingival crevicular fluid (GCF), and to evaluate their influence on the rate of teeth alignment during leveling and alignment stage.

Methods: Forty patients were evenly and randomly distributed in a blinded way to one of four groups: placebo (starch capsules), acetaminophen 500mg thrice daily, ibuprofen 400mg thrice daily, and etoricoxib 60mg once daily. Drug was given 1 h before bonding and archwire placement and continue for 3 days. A 100mm visual analogue scale was used to measure pain levels before archwire placement, after archwire placement, on the first, second, third, and seventh day. GCF samples were collected before bonding, on the first, and seventh day to measure the amount of RANKL, OPG, PGE_2 and leptin released. GCF contents was determined using enzyme-linked immunosorbent assay (ELISA) test. Little irregularity index was measured before bonding and at every activation visit until the end of the alignment and leveling stage.

Results: All the 3 drugs showed lower pain levels than placebo at the bonding and first activation visits. Etoricoxib showed the least pain level

among other drugs followed by ibuprofen. No statistically significant differences were found between the drug groups and the placebo at the second and third activation visits. No significant differences were found in inflammatory mediators within all experimental groups. Etoricoxib showed a significant higher OPG levels than acetaminophen after 24 hours and placebo group after 7 days from bonding, while leptin levels were significantly higher in control group than acetaminophen group after 24 hours from bonding. No statistically significant differences were detected between the four experimental groups concerning the rate of teeth alignment. No statistically significant correlation was found between different inflammatory mediators and rate of teeth alignment in drugs and control groups.

Conclusions: The 3 drugs were all effective in controlling pain only during the first two visits of orthodontic treatment. However, etoricoxib 60mg/day was the most effective. All the 3 drugs had no influence on rate of teeth alignment when used in their least recommended dose.

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