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The effect of acetaminophen, ibuprofen, and misoprostol on prostaglandin E_2 synthesis and the degree and rate of orthodontic tooth movement

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ABSTRACT

The present study compared the effect of acetaminophen, ibuprofen and misoprostol on PGE_2 synthesis and orthodontic tooth movement. Guinea pigs were randomly assigned into one of three test groups or a control group. Each group received study treatments every 12 hours as an orthodontic force was applied to the maxillary incisors. Direct linear measurements of tooth separation were recorded at days 2, 4, 6,10, and 11, and inflammatory exudate from the periodontal ligament (PDL) space was extracted and quantitatively analyzed radioimmunologically for the presence of PGE_2 at days 4 and 9. Comparing the concentration of PGE_2 in sample extracts, a significant difference (P=0.001) was found among drug groups. A highly significant difference was found between the mean tooth separation among the various drug groups (P<0.001). At day 11 the misoprostol group exhibited 4.49 ± 0.49 mm of separation; ibuprofen 2.56 ± 0.11 mm, and the control and acetaminophen groups exhibited similar degrees of tooth separation: 3.31 ± 0.07 mm and 3.31 ± 0.08 mm, respectively. A highly significant difference occurred between the mean rates of tooth separation among the various drug groups after day 8 (P<0.001). Results of this study suggest that acetaminophen is the analgesic of choice for the relief of minor discomfort associated with orthodontic treatment.

KEY WORDS: Prostaglandin E_2, Tooth movement, Inflammation, Nonsteroidal anti-inflammatory drugs.

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