

**Participation of TRPV1 in tooth movement-related pain**

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The many patients complain about orthodontic force-induced pain. It has reported that jaw-opening reflex (JOR) excitability is increased in 1 (D1) day and is decreased in 7 days (D7) after orthodontic force application in rats. In this model, potential analgesic role of Receptor Potential Vanilloid 1 (TRPV1) antagonism in orthodontic force-induced pain and related features were investigated.

Rats were applied continuous orthodontic force to right maxillary first molar. TRPV1 antagonists (A-889425: 5-10 mmol/kg, AMG9810: 10-15 mmol/kg) or aspirin (560 mmol/kg) was applied to D1-D7. Inflammatory cytokines were measured by antibody arrays. Excitation of trigeminal ganglia (TG) was evaluated by expression of Glial fibrillary acidic protein (GFAP) in satellite glial cells. And, expression of mature osteoclasts was measured by TRAP staining.

All chemicals significantly reduced JOR excitability at D1. Temporal alteration of JOR excitability was associated with GFAP expression and that was significantly reduced by TRPV1 antagonists and aspirin. Although these chemicals reduced expression of mature osteoclasts at D7 significantly, distance of tooth movement was not altered. Significant increase of CINC2 and IL-6 was induced by orthodontic force application. Both TRPV1 antagonists significantly reduced CINC2 and IL-6, however, aspirin failed to reduce CINC2.

Taken together, TRPV1 antagonism, in both peripheral and central, induced broad effects on orthodontic force-induced physiological and morphological alterations.