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Meeting abstract

The effect of cetirizine, an H_1 receptor antagonist, on bone modeling during orthodontic tooth movement in rats

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Background

H_1 receptor antagonists are widely used drugs for treatment of allergic conditions. While histamine is involved in bone remodelling [1-3], the aim of this study was to determine the effects of cetirizine, an H_1 receptor antagonist, on bone modeling processes during orthodontic tooth movement.

Methods

We used three groups of Wistar rats: control group (n = 16), orthodontic appliance only group (n = 16) and cetirizine group (n = 16). Animals of the last two groups were fitted with a super-elastic closed coil spring appliance (F = 25 cN) between the upper first left molar and the upper incisors. Animals of the appliance only group were treated daily with saline and animals of the cetirizine group with 3 mg/kg of cetirizine, respectively. Tooth movement was measured weekly from day 0 to day 42. Animals of each group were sacrificed on day 42 and tissue samples were prepared for further analysis. Gene expression levels for bone turnover markers cathepsin K and osteocalcin were determined by means of RT-PCR. Alveolar bone volume, osteoblast and osteoclast volume were determined histomorphometrically.

Results

Cetirizine decreased the amount of tooth movement from day 28 onwards ($p < 0.01$) and it also decreased osteoclast volume ($p < 0.001$). The increase in the alveolar bone volume was observed in the cetirizine group ($p < 0.01$) compared to the appliance only group. No significant difference was observed in osteoclast activity, osteoblast volume and osteoblast activity between the cetirizine and the appliance only groups.

Conclusion

Cetirizine influences bone modeling, mainly by inhibiting bone resorption. Therefore, H_1 receptor antagonists therapy is supposed to interfere with orthodontic treatment.

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