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Evaluating the Systemic Effect of Magnesium Oxide on Gene Expression of Osteocalcin and Vitamin D Receptors in Rabbits with Orthodontic Teeth Movement



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Abstract

BACKGROUND: The Bone is continuously remodeling in response in response to external and metabolic stimuli. It mimics orthodontic tooth movement by altering bone. Magnesium is a main human mineral That helps in bone development **Aim of the study** : to evaluate the systemic effect of Magnesium oxide on bone formation in rabbit with orthodontic teeth movement. **Material and method** : 20 male albino rabbits weighing (1100-1450) gm. Two control (positive and negative) and two experimental groups each had five animals (low dose and high dose). During orthodontics, experimental animals received 40 mg/kg and 80 mg/kg of MgO daily. Lower central incisors of rabbits received fixed orthodontic devices for three weeks. All study groups sacrificed animals at the end. The lower jaw was isolated and section bone specimens were taken from the site of relocated teeth, gum, and periodontal ligament for quantitative PCR (QPCR). SPSS used ANOVA and Tukey tests to find statistically significant differences **Result** : No significant changes at $p \leq 0.05$. Regarding serum Ca^{+2} , Mg^{+2} and alkaline phosphatase) in treatment group compared to control groups, however genomic study showed that there was an increase in the quantitative gene expression of both osteocalcin and vitamin D receptors at (bone , gum and periodontal ligament) in the regarding low dose magnesium -treated group than in the control group and high dose group at the end of study periods. **Conclusion** : magnesium low dose increase bone formation and regeneration at the bone sites of orthodontic teeth movement more than the control untreated rabbits and high dose group.