



Republic of Iraq
Ministry of Higher Education
and Scientific Research
University of Baghdad
College of Dentistry



**EFFECTS OF LOCALLY DELIVERED GEL-BASED
ALENDRONATE AND/OR RECOMBINANT HUMAN BONE
MORPHOGENETIC PROTEIN-2 ON DENTAL IMPLANT
STABILITY, MARGINAL BONE LEVEL, AND
PERIIMPLANT BONE DENSITY:
A RANDOMIZED CONTROLLED CLINICAL STUDY**

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 Oral and Maxillofacial Surgery

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ABSTRACT

Introduction: The success of dental implant treatment is mainly dependent on the quality of bone holding the implant, and if this could be enhanced locally, the surgical procedure might be simpler and the rehabilitation would be earlier. The aim of this study was to evaluate the changes in the implant stability, marginal bone level, and periimplant bone density in response to local application of alendronate alone or combined with recombinant human bone morphogenetic protein-2 in comparison to a control.

Materials and Methods: 71 dental implants were used for replacing missing tooth/teeth in 27 patients. The implants were allocated randomly into four groups. Group 1 and 2; local application of alendronate and protein gel respectively, group 3; local application of a mixed formula of both gels. The gel application was immediately pre-implant insertion, group 4; implant insertion without application of any medication (control). Implant stability was measured 4 times; primary, 8- and 12-weeks post insertion, and about 25 weeks post functional loading. The changes of marginal bone level and periimplant bone density were assessed immediately post-surgery, immediately post prosthesis insertion, and post functional loading.

Results: A similar pattern of implant stability changes was reported over the study period with no significant differences ($p \geq 0.05$) between groups. There was no significant effect ($p \geq 0.05$) regarding bone level differences of test groups against control, although there were significant differences on palatal ($p=0.018$) and mesiodistal ($p=0.035$) surfaces among the test groups. Periimplant bone density was significantly increased post implant insertion in all study groups from baseline to the postloading measurements. Alendronate and protein groups showed also increase in bone density from baseline to the preloading time points, and representing the highest differences, although statistically not significant.

Conclusions: Within the limitations of this study, the results concluded that there was a continuous increase of implant stability and periimplant bone density which was dependent on the healing time and loading irrespective to the local therapy compared to the control group at the end of the study. There were no significant treatment effects regarding marginal bone level, although there were significant differences on palatal and mesiodistal surfaces among the test groups.



جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة بغداد
كلية طب الاسنان



**تأثير الاستخدام الموضعي لهلام الأليندرونات لوحده أو مقترناً بالبروتين المكوّن للعظم
البشري المؤتلف - ٢ على التغيرات في ثبات زرعة الأسنان ومستوى العظم
الهامشي وكثافة العظم المحيط بها: دراسة سريرية عشوائية**

رسالة مقدمة الى مجلس كلية طب الأسنان في جامعة بغداد كجزء من متطلبات نيل شهادة الدكتوراه في
جراحة الفم والوجه والفكين

مقدمة من قبل

ضحى عبدالرحمن العساف

بكالوريوس طب وجراحة الفم والأسنان

ماجستير جراحة الفم والوجه والفكين

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