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The Effect of Systemic Administration of Simvastatin on Dental Implant Stability: A Random Clinical Study

A Thesis

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the Degree of Master of Science in Oral and Maxillofacial Surgery

By

Ali Mohammed Hasan

B.D.S.

Supervised By

Assist. Prof. Adil Al Kayat

FDSRCS London

M. Med. Sci. Sheffield University

B.D.S. Baghdad

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Jamadi II 1435

Abstract

Background: the primary objective for many researches carried out in dental implantology was to reduce the period needed for functional implant loading, simvastatin (cholesterol lowering medication) had many pleiotropic effects, one of which was increasing bone density around titanium implants and subsequently establishing faster osseointegrated dental implants.

Aim of the study: This study aims to evaluate and compare dental implant stability measured in ISQ (implant stability quotient) that refer to as osseointegration between a group of females with administration of systemic oral simvastatin and another group without prescribing the drug.

Materials and methods: twenty four healthy females aged (40-51) years old received 29 dental implants (Dentium, Korea) were divided into two groups, control and intervention groups with eleven subjects in each group. All subjects were radiographed with OPG for preliminary assessment and with CT scan for registering bone density in Hounsfield Units.

The control group received 13 dental implants and the intervention group received 16 dental implants, all dental implants were placed in the traumatic functional implant zone. Different dental implant sizes were used according to optimal patient's needs.

Subjects of the intervention group were administered simvastatin tablets orally 40mg/day for three months starting from the day of surgery after an informed consent was obtained from them and the recommended monitoring protocol was followed.

Dental implant stability ISQ were recorded using RFA by Osstell™ ISQ for both groups three times: immediately after implant placement (at surgery) and after 8, 12 weeks respectively.

Results: results showed that the mean implant stability for the intervention group was significantly higher $P= 0.01$ after 12 weeks in comparison to that of the control group.

Age, bone density and implant dimensions had no statistical significance on primary stability of the implant.

Simvastatin showed statistically significant effect on implant stability among the intervention group after 8 and 12 weeks (P value for both times <0.001) with the attributed risk percent was 70.8 and 50 respectively. Dental implant length and diameter had statistically significant effect on implant stability after 8 weeks (P value 0.08, 0.017) respectively, and after 12 weeks (P value 0.07, 0.007) respectively, whereas age and bone density remained non-significant statistically.

Conclusions: this study concluded that the intervention group had higher implant stability and was ready for functional loading prior to control group and that when correct choices regarding implant dimensions and surgical technique were made, age and bone density played minimal role in primary stability.