



The Effect of Xylitol on Bone Alkaline Phosphatase Serum Level and Bone Defect Diameter in Rabbits

ABSTRACT

Our study aimed to investigate the systemic and topical effect of xylitol on the bone Alkaline Phosphatase and the bone mineral density in rabbits at the healing site in femur bone postoperatively. Twenty-four healthy white male, New Zealand rabbits, will be taken from the same species; the same age, Weight, and circumstance were chosen in this study. The Weight ranges from (1.3- 1.8) Kg and aged (6-8) months were used in this study). All animals were submitted to operation in the femur bone region. The groove of 2mm diameter was drilled in the femur bone by using the heavy-duty dental engine. After the operation, the rabbits were randomly divided into three groups (8 rabbits/group); each group was subdivided into 2 experimental periods (14,28 days) four rabbits for each period as follows: Control group, n=8 (the hole was not filled by anything), locally treated group n=8 (xylitol powder was applied and condensed well in the hole) and systemically treated group n=8 (the hole was not filled by anything but the rabbits received orally of 1mg/kg of xylitol. Bone alkaline phosphates and radiological analysis were measured after 14 and 28 days, respectively. Statistical analysis showed significant differences between all groups (control and treated). Biochemical analysis for bone alkaline phosphatase showed a significant increase in bone Alkaline Phosphatase in the systemically treated group compared with the control one. The estimated bone healing by measuring the diameter of bone defect showed a highly significant difference in diameter in the bone defect at day 14 between the control group (36.0 ± 0.05) in comparison with the treated local group and systemic treated group (39 ± 0.78) and (25 ± 0.90) respectively. Also, we found a significant difference between the local treated group (39 ± 0.78) and systemic treated group (25 ± 0.90) in diameter. Still, on day 28, there was no significant difference between the control group (28.0 ± 0.55) and the local treated group in diameter in the bone defects. There were significant differences between the control and the local treated groups compared with the systemic treated group (24.0 ± 0.23) at $p \leq 0.05$. This study concluded that xylitol was accelerating bone healing when used topically and systemically, and this was indicated by increasing the bone alkaline phosphates and bone mineral density in densitometric analysis.