OsteoBiol® by Tecnoss

The Effects of Insulin and Strontium Ranelate on Guided Bone Regeneration in Diabetic Rats

EXPERIMENTAL STUDIES

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ABSTRACT

Diabetes can be associated with different pathologies and with a decreased tissue regeneration capacity. One of the consequences and signs of diabetes is the reduced repairing and bone formation capacity. The relationship between diabetes and dental implants osseointegration has been widely analyzed, but little information is known about the impact of diabetes on guided bone regeneration. The purpose of this study was to evaluate the effects of insulin and strontium ranelate on guided bone regeneration in diabetic rats. Thirty Wistar male rats were divided in 5 group: Group H, with healthy subjects; Group D, with experimentally induced diabetes; Group DI, with experimentally induced diabetes treated with insulin, daily; Group DS, with experimentally induced diabetes, treated with strontium ranelate 5 days/ week; Group DIS, with experimentally induced diabetes treated with insulin, daily and with strontium ranelate 5 days/week. The surgical procedures were performed 7 days following diabetes induction. Following a muscular-periosteal flap elevation and the proximal metaphysis of the left tibia exposition, a 1 mm diameter hole was drilled, in which a cortical - lamellar bone (OsteoBiol® mp3®, Tecnoss®, Giaveno, Italy) and a collagen membrane (OsteoBiol® *Lamina*, Tecnoss®) were applied. The bone graft was a mixture of cortical - lamellar bone (90%), of porcine origin (600-1000 μm granulometry) combined with a collagen gel (10%) (OsteoBiol® *Gel 0*, Tecnoss®). After 12 weeks, the animals were sacrificed for the histological examination and histomorphometric analysis. The results showed that strontium ranelate increased bone regeneration capacity and newly formed volume when compared with controls. Strontium ranelate improved bone density in the region where the porcine graft was inserted. Bone regeneration with this type of material took place in optimum conditions both for both healthy subjects and those with diabetes who have had a controlled glycaemia.

CONCLUSIONS

In Authors' opinion, the result of this study confirm the biocompatibility of Osteobiol® *mp3®*, combined with OsteoBiol® *Gel 0*, in healthy and diabetic subjects with controlled status of serum glucose concentration. As reported in their conclusions, *"the material has osteoconductive properties, acting as a matrix for bone cells, which leads to a gradual increase in bone growth in the xenograft. We also observed the replacement of osteoid by adipose tissue and hematopoietic bone marrow, which indicates the ability of this material to resorb partially and sequentially"*.

A Nemtoi[1]
V Danila[2]
E Dragan[2]
S Pasca[3]
A Nemtoi[2]
M Constantin[2]
A Sava[1]
D Haba[2]

1 | TGr. T. Popa University of Medicine and Pharmacy, Department of Anatomy, 16 Universitatii Str., 700115, Iasi, Romania
2 | Gr. T. Popa University of Medicine and Pharmacy, Department of Oral and Maxillofacial Surgey, 16 Universitatii Str., 700115, Iasi, Romania
3 | Ion Ionescu de la Brad University of Agricultural Sciences and Veterinary Medicine, Department of Pathological Anatomy and Forensic Medicine, 3 Mihail Sadoveanu Alley, 700490, Iasi, Romania

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