

Bone Regeneration Treatment in Diabetics

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Technology description

Prof. Salem and his colleagues at the University of Iowa have developed a unique formulation and method to deliver vitamin D, insulin, fibrin, and BMP-2 to bone fracture sites in diabetics. This combination has the potential to enhance bone regeneration, and in some instances, it also leads to bone formation in diabetics. This delivery method to the fracture site does not affect systemic blood glucose parameters.

Background Information

Certain systemic diseases that affect the metabolism of glucose are associated with decreased bone mineral density and increased risk of fractures. One such disease is chronic diabetes mellitus (DM), which currently affects over 150 million people worldwide. Insulin can act as an anabolic agent for bone and appears to play a key role in fracture healing and bone growth. Therefore, the delivery of insulin and vitamin D at the fracture sites could normalize cellular proliferation, mineralization, and cartilage content of the fracture callus without affecting systemic blood glucose parameters. However, studies exploring the effect of vitamin D on bone healing in diabetic animals are rare, and there is currently no efficient drug delivery system for delivering insulin and vitamin D to enhance bone regeneration.

Technology Summary

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Advantages

- Enhanced bone regeneration in diabetic patients
- Potential for bone formation
- Effective delivery of vitamin D and insulin to the fracture site, without affecting systemic blood glucose parameters

Institution

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