World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:8, No:09, 2014

Improval of Fracture Healing of Osteoporotic Bone by Lovastatin-Incorporated Poly-(DL-Lactide)

Authors : Nurul Izzah Ibrahim, Isa Naina Mohamed, Norazlina Mohamed, Ahmad Nazrun Shuid

Abstract : Osteoporosis disease delays fracture healing. Statins have shown potential for osteoporosis and to promote fracture healing. The effects of statin can be further potentiated by combining it with a carrier known as poly-(DL-lactide), which would provide persistent release of statin to the fracture site. This study was designed to investigate the effects of direct injection of poly-(DL-lactide)-incorporated lovastatin on fracture healing of postmenopausal osteoporosis rat model. Twenty-four Sprague-Dawley female rats were divided into 3 groups: sham-operated (SO), ovariectomized-control rats (OVxC) and poly-(DL-lactide)-incorporated lovastatin (OVx+Lov) groups. The OVx+Lov group was given a single injection of 750 µg/kg lovastatin particles incorporated with poly-(DL-lactide). After 4 weeks, the fractured tibiae were dissected out for biomechanical assessments of the callus. The OVx+Lov group showed significantly better callus strength than the OVxC group ($p<0.05$). In conclusion, a single injection of lovastatin-incorporated poly-(DL-lactide) was able to promote better fracture healing of osteoporotic bone.

Keywords : statins, fracture healing, osteoporosis, poly-(DL-lactide)
Conference Title : ICBBE 2014 : International Conference on Biological and Biomedical Engineering
Conference Location : Rome, Italy
Conference Dates : September 18-19, 2014