

ABSTRACT

Effectiveness of Injectable Alendronat for Bone Defect because of Fracture with Osteoporosis Model

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The aim of this study was to determine the effectiveness of injectable alendronate in bone defect due to fracture of osteoporosis using ovariectomized rat model (OVX).

In this study, 24 female Wistar rats were divided into 4 groups: negative control (not OVX), positive control (OVX), and 2 treatment groups were BHA-Gel-HPMC (OVX) and BHA-Gel-HPMC-Ale (OVX). After 8 weeks, a defect was created at the right femur with a diameter of 2mm in all groups and filled with injectable in the treatment group. Healing process was observed after 6 weeks. Radiological analysis was focused on the size of bone defect and histological analysis using hematoxylin-eosin (HE) staining was focused on the number of osteoblast, osteocyte, and osteoclast.

In the radiology analysis, the size of bone defect significantly decreased in the negative control compared to the positive control ($p < 0.05$). However, BHA-Gel-HPMC-Ale not significant difference between positive control and BHA-Gel-HPMC ($p > 0.05$). In the histological analysis, the osteoblast and osteoclast number in the positive control significantly increased compared to the negative control ($P < 0.05$). Both BHA-Gel-HPMC and BHA-Gel-HPMC-Ale group significantly increased the number of osteoblast, osteocyte, and osteoclast compared to the positive control ($p < 0.05$) with not significant difference between BHA-Gel-HPMC and BHA-Gel-HPMC-Ale group ($p > 0.05$).

This study showed that injectable alendronate did not accelerate closure of bone defect and bone cell formation.

Keyword : Osteoporosis, fracture, Alendronate, Ovariectomy, *Bovine Hydroxyapatite*, Gelatin.