

## Documents

Zulkifly, A.H., Jan, N.H.M., Ibrahim, M.Z.

**A STUDY ON GENTAMICIN IMPREGNATED BIOMATERIALS FOR TREATING INDUCED OSTEOMYELITIS IN THE NEW ZEALAND WHITE RABBIT ANIMAL MODEL: AN OVERVIEW OF MICROSCOPIC ANALYSIS**

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**Abstract**

Osteomyelitis (OM) treatment remains a significant challenge in orthopaedics surgery. This infection is challenging to treat and requires prolonged antibiotic administration. The New Zealand White Rabbit (NZWR) is a suitable experimental model for studying local delivery antibiotics treatment for osteomyelitis because it closely mimics the disease process in humans. This study aimed to induce osteomyelitis in rabbit femurs and analyse the treatment with gentamicin beads impregnated with biomaterials. The study was evaluated in thirty-six of NZWRs. They were divided into Hydroxyapatite (HA) and Calcium Sulphate (CaSO<sub>4</sub>) with four subgroups: 3, 6, 12, and 26 weeks. Each NZWR underwent two surgeries; involved the first surgery was to induce osteomyelitis by inoculating *Staphylococcus aureus* in the distal femur, followed by the second surgery was for debridement and biomaterial-impregnated antibiotics implantation. Histological interpretations indicated that all rabbits developed osteomyelitis 3 weeks after the bacteria were inoculated. At 6 to 26 weeks, complete healing of the infected area was noted, with the appearance of new bone formation. Both findings indicated a complete bone healing after a 26 weeks interval. The results of histology interpretation in each group were comparable. Therefore, the findings of this study indicated that gentamicin impregnated with HA could be used in treating OM. © Malaysian Journal of Microscopy (2023). All rights reserved.

**Author Keywords**

calcium sulphate; gentamicin-impregnated biomaterials; histological interpretation; hydroxyapatite; Osteomyelitis

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