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CARBOXYMETHYL CHITOSAN-ZINC COATING FOR PREVENTION OF PIN TRACT INFECTION: AN ANIMAL MODEL

Vidmi Taolam Martin^{1,2}, Lei Wang^{1,2}, Rong Zeng³, DeQiang You³, XianRong Zhang^{1,2}, Welera Haissou Elodie¹ and Bin Yu^{1,2}

¹Nanfang Hospital of Southern Medical University, China

²Jinan University, China

Background: Pin tract infection is a common problem in orthopaedic and traumatology surgery. The aim of this study was to investigate the efficacy of an implant coated with carboxymethyl chitosan-zinc (CMC-Zn²⁺) in prevention of pin tract infection.

Materials & Methods: 24 male New Zealand white rabbits were randomized into two equal groups (n=12, uncoated and CMC-Zn²⁺). The implants were colonized with 1x10⁶ colony forming units of *Staphylococcus aureus* and inserted into the lateral right proximal tibia in each rabbit. In each group, at 2 and 4 weeks post-surgery, five and seven rabbits were killed, respectively, to harvest the soft tissues around the implant as well as the hard tissue for histological analysis. The bone cross-sectional view, X-ray, and micro-computed tomography (μ CT) were performed.

Results: The surgical sites in each animal were evaluated individually at both time points. No evident signs of infections were found in the CMC-Zn²⁺ group, while a high rate of infection was observed in the uncoated group where minor infections were 85.71% (n=12) and major infections 14.29% (n=12). The radiography, μ CT and histological analysis showed no evident signs of infection in both groups at two weeks post-surgery. However, at four weeks, signs of infection were found in all the animals in the uncoated group, whereas in the CMC-Zn²⁺ group, no infections were observed. The difference between the two groups was highly significant (p=0.00).

Conclusions: Our study showed that CMC-Zn²⁺ coated implants were effective in preventing pin tract infection.

Biography

Vidmi Taolam Martin is a PhD candidate in Orthopedic and Trauma Surgery at Southern Medical University (China). He is currently working in Clifford Hospital as an Attending Physician. He has published two papers in reputed journals.

taolamfils@yahoo.fr