

ABSTRACT

Microbial activity study of ciprofloxacin in bone implant towards *Escherichia coli* ATCC 25922 (chitosan – bovine hydroxyapatite as composit and genipin as cross-linker)

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Osteomyelitis is a bone inflammation process caused by microorganism infection. Osteomyelitis will lead to bone damage. Ciprofloxacin as local antibiotic delivery system (implant) is an effective way for osteomyelitis therapy. Composite implants consist of bovine hydroxyapatite and chitosan combination has physical characteristics suitable for ossification. Cross-linked chitosan can control drug release. Genipin can be used for chitosan cross-linker. This study aims to determine influence of genipin concentration in bone implant to microbial activity ciprofloxacin towards *Escherichia coli* ATCC 25922.

In the previous studies, implants were made from ciprofloxacin 10% formulated into chitosan-bovine hydroxyapatite (60:30) composites with genipin 0.3% dan 0.5% as cross-linker. Result showed that the implant had released ciprofloxacin in controlled condition with therapeutic window 2-50 µg/mL. The sample of released study was done with microbial assay by 3-3 design Agar Diffusion using hole-plate method.

The result of this study described that the potency of ciprofloxacin in bone implant Formula I (0.3% genipin), Formula II (0.5% genipin) were 111.28% and 110.79% respectively. Potency of two formulas meets the requirements for antibiotic microbial assay that was 80-125%. Increasing genipin concentration statistically didn't affect the potency of ciprofloxacin in chitosan-bovine hydroxyapatite bone implant.

Keywords : ciprofloxacin-bone implant, chitosan-bovine hydroxyapatite, genipin, microbial assay