



EVALUATION OF EFFICACY OF CHITOSAN DERIVATIVE BASED HEMOSTAT: ANIMAL STUDY

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Abstract

Background: Chitosan has been used to accelerate hemostasis. In our previous study, N,O-carboxymethylchitosan (NOCC), a chitosan derivative, was found to have a greater hemostatic ability than chitosan and its hemostatic ability was enhanced when NOCC was blended with alginate. The blood coagulation ability of the hemostat and a commercial hemostat, SPONGOSTANÒ, was conducted using a hemorrhagic rat model

Objectives: To evaluate the hemostatic ability of N,O-carboxymethylchitosan (NOCC)

Methods: Twenty nine anesthetized Wistar rats (females, 200-300 g) were divided into three groups. Bleeding was induced by transecting a rat tail, 10 mm from the tip. In Group I denoted as control, the blood was regularly blotted with a filter paper (No. 3) at 60 second intervals until no more blood was observed on the paper upon blotting. In Groups II and III, the NOCC based hemostat and SPONGOSTANÒ Standard pads were, on the other hand, pressed up against transected areas, respectively, from below for 1 min. The contact point was moved to another area of the pad every 1 min. The process was repeated until the bleeding stopped. The total bleeding time and blood loss were determined and compared among these groups. Statistical analysis was performed using One-Way ANOVA followed by Scheffe for a multiple comparison with a 95% confidence interval. Significance was at the $p < 0.05$ level.

Results: The average bleeding time of the non-treated rats was about 20 min. The chitosan derivative based hemostat could stop the bleeding more effectively than SPONGOSTANÒ. The bleeding time was reduced to about 7 min. With a SPONGOSTANÒ treatment, the average bleeding time was only decreased to about 15 min.

Conclusions: On comparison, both carboxymethylchitosan based hemostat and SPONGOSTANÒ demonstrated that the chitosan derivative based hemostat stopped the bleeding at the transected rat tails more effectively than the commercial product; the bleeding time was much shorter and the amount of the blood loss was far less.

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