

## Effect of a single dose of tranexamic acid on perioperative blood loss in dogs undergoing spinal surgery

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The aim of this prospective clinical study was to determine whether single pre-operative administration of tranexamic acid reduces blood loss in dogs undergoing spinal surgery. One hundred dogs (excluding sighthounds and crosses) scheduled for spinal surgery were enrolled. Dogs were randomly allocated into two groups: treatment (TXA, 15 mg kg<sup>-1</sup>, IV) and control (equivalent volume of 0.9% NS). Block-randomisation was based on surgical procedure (ventral slot, dorsal laminectomy, hemilaminectomy, complex hemilaminectomy). Blood loss was estimated by measuring surgical swabs and suction jar weights and visual estimation of losses on the surgical drapes and floor. The primary preregistered outcome measure was the total blood loss in mL kg<sup>-1</sup>. Secondary outcomes were blood loss exceeding 10% of blood volume and clinical requirement for unblinding. Mann-Whitney-U and Chi-squared tests were used to compare groups ( $\alpha = 0.05$ ).

Anaesthesia and surgical times, breed, age or weight were not significantly different between groups. Mean ( $\pm$  SD) blood loss in controls was 5.01 mL kg<sup>-1</sup> ( $\pm$  4.49) and 4.80 mL kg<sup>-1</sup> ( $\pm$  5.03) in the TXA group ( $p = 0.459$ ). Eleven dogs were unblinded in the control group versus twelve in the TXA group. Blood loss greater than 10% was experienced in 12 dogs, 7 in the control group and 6 in the treatment group. The single pre-operative administration of TXA at 15mg kg<sup>-1</sup> did not result in reduced blood loss during spinal surgery.

Based on the effect size in the human literature a difference should have been evident (Heyns et al. 2021). This may be due to species differences; dogs have shown to have accelerated fibrinolysis compared to humans and an *in vitro* model has suggested that higher intravenous doses may be necessary (Fletcher et al. 2014; Osekavage et al. 2018). Thus, studies assessing higher intravenous doses and guided with *in vivo* coagulation assays may be insightful.

### References

Fletcher DJ, Blackstock KJ, Epstein K et al. (2014) Evaluation of tranexamic acid and epsilon-aminocaproic acid concentrations required to inhibit fibrinolysis in plasma of dogs and humans. *Am J Vet Res* 75, 731-738.

Heyns M, Knight P, Steve AK et al. (2021) A Single Preoperative Dose of Tranexamic Acid Reduces Perioperative Blood Loss: A Meta-analysis. *Ann Surg* 273, 75-81

Osekavage KE, Brainard BM, Lane SL et al. (2018) Pharmacokinetics of tranexamic acid in healthy dogs and assessment of its antifibrinolytic properties in canine blood. *Am J Vet Res* 79, 1057-1063.