Intraosseous administration of TXA is as effective as intravenous in reversing hyperfibrinolysis in a porcine model of hemorrhagic shock” Lallemand et al (2017).

Abstract:

BACKGROUND: The acute coagulopathy of trauma is often accompanied by hyperfibrinolysis. TXA can reverse this phenomenon, and, when given early, decreases mortality from bleeding. Establishing IV access can be difficult in trauma and IO access is often preferred for drug administration. Currently, there is no data on the efficacy of IO administered TXA. Our objectives were to compare serum concentrations of tranexamic acid (TXA) when given IV and intraosseous (IO) and to compare the efficacy of IO administered TXA to IV at reversing hyperfibrinolysis.

METHODS: Using a porcine hemorrhage and ischemia-reperfusion (IR) model, 18 swine underwent hemorrhagic shock followed by a tissue plasminogen activator (tPA) infusion to induce hyperfibrinolysis. Animals then received an IV or tibial IO infusion of TXA over 10 minutes. Blood was then analyzed using ROTEM to monitor reversal of hyperfibrinolysis. Serum was analyzed for drug concentrations.

RESULTS: After hemorrhage and IR, there were no significant differences in MAP (48 vs 49.5),
Intraosseous administration of Tranexamic Acid is as effective as intravenous | 2

lactate (11.1 vs 10.8), and pH (7.20 vs 7.22) between groups. Intraosseous TXA corrected the lysis index at 30 minutes in EX-TEM and IN-TEM, like IV infusion. Peak serum levels of TXA after IV and IO administration show concentrations of 160.9μg/mL and 132.57μg/mL respectively (p=0.053). Peak levels occurred at the completion of infusion. Drug levels were tracked for four hours. At the end of monitoring, plasma concentrations of TXA were equivalent.

CONCLUSION: Intraosseous administration of TXA is as effective as intravenous in reversing hyperfibrinolysis in a porcine model of hemorrhagic shock. Intraosseous administration was associated with a similar peak levels, pharmacokinetics, and clearance. Intraosseous administration of TXA can be considered in hemorrhagic shock when IV access cannot be established.

LEVEL OF EVIDENCE: III STUDY TYPE: Therapeutic Study.

Reference:


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