

The Use of Tranexamic Acid to Decrease Perioperative Blood Loss Following a TKA

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Received date: Jul 3, 2014, Accepted date: Jul 16, 2014, Published date: Jul 22, 2014

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Mini Review

Perioperative blood loss during total knee arthroplasty can be significant; in fact, post-operative blood loss following a total knee arthroplasty (TKA) has been reported to range from 500 to 1000 mL [1-4]. Historically, allogenic transfusions were the standard method of managing acute blood loss after TKA; however, due to the published risks associated with transfusions including transfusion reactions [1,5] and the high cost, [6,7] surgeons are trying to find an alternative method to better manage blood loss following a TKA.

Tranexamic acid (TXA) is a pharmacological agent that reduces the conversion of plasminogen to plasmin, an enzyme that degrades fibrin clots, fibrinogen and other plasma proteins [8]. TXA provides an inexpensive synthetic antifibrinolytic agent that has been demonstrated to be effective in multiple surgical procedures [9]. For one, TXA has been shown to significantly reduce post-operative blood loss following TKA and can be safely administered both intravenously (IV) with a single or double dose and topically with no increased risk of thromboembolic events [4,7,10-19]. The cost of 1 g of tranexamic acid is approximately \$58; however, the decrease in transfusion rates using TXA leads to a significant decrease in cost per patient [6,7,11].

While the current literature has reported the success and safety of tranexamic acid, no consensus dosing schedule, timing or route of administration method has been established. The current contraindications to giving the drug IV include cardiac disease, renal or hepatic disease, and a previous embolic event, while no current contraindication exists for the topical administration [12]. If giving IV, some literature also suggests it should be given as two doses with one preoperatively or post-operatively and one dose 5 min prior to deflation of the tourniquet [20,21]; yet other studies state it can be given effectively at the start of the procedure [1,22,23]. In a meta-analysis of 7 studies analyzing topical TXA in primary TKA, the dose of topical tranexamic acid ranged from 250 mg to 3 g in 5 ml to 100 ml of saline [23], whereas IV dosages range from a single or double dose of either 1 g, 2 g or 3 g of tranexamic acid [24].

The use of pharmacologics has long been underappreciated in orthopedics; however, the use of tranexamic acid during total knee arthroplasty is becoming an emerging standard of care. For the orthopaedic surgeon, the take home message is it works regardless of how you dose it or how you administer it; while future studies need to establish consensus in the orthopaedic community as to how it is best delivered, surgeons can now use the drug with confidence, as it is cheap and effective at reducing blood loss after TKA.

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