Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Will the prehospital topical administration of injectable Tranexamic acid decrease time to hemostasis and reduce the occurrence of rebleeding in adult patients experiencing epistaxis?*

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Clinical Scenario: *Paramedics arrive at the scene to a 54-year-old female patient complaining of an acute onset of epistaxis. She explains that her nose began bleeding approximately 30 minutes ago, but denies any preceding nasal or facial trauma. She admits that she first attempted to stop the bleeding by squeezing her nose and applying a towel, and after approximately 10 minutes, she believed the bleeding had stopped. However, shortly afterward, she noticed the bleeding had once again started and as a result she called 911. The patient denies any personal or familiar history of coagulopathic disorders and takes no anticoagulant medications. Rather than once again attempting manual occlusion of the hemorrhaging nare the paramedics opt to treat this patient by applying injectable Tranexamic acid to a piece of gauze that they then place in the nare in hopes to obtain hemostasis quicker, as well as reduce the risk of further rebleeding episodes.*

PICO (Population – Intervention – Comparison – Outcome) Question:

In prehospital adult patients, experiencing acute epistaxis, does the topical administration of injectable Tranexamic Acid, when compared to manual occlusion, reduce both the time to hemostasis and the occurrence of episodes of rebleeding?

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Search Strategy:

((("Epistaxis"[Mesh] OR epistaxis OR nosebleed OR rhinorrhag OR nasal haemorrhag*))) AND ((("Tranexamic Acid"[Mesh] OR tranexamic acid OR TXA OR antifibrinolytic)))*

Search Outcome:

119

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Zahed R. 2013	*216 Emergency Department patients with acute anterior epistaxis*	*Randomized Control Trial* *LOE 1* *Topical TXA vs Anterior Nasal Packing*	*- Frequency of hemostasis within 10 minutes of treatment onset* *- Frequency of patients experiencing rebleeding within 24 hours after treatment* *- Frequency of patients experiencing rebleeding within 7 days after treatment* *- Patient time to discharge from the ED* *- Patient satisfaction* *- Prevalence of complications*	*Within 10 minutes of treatment, 71% of TXA group achieved hemostasis compared to 31.2% of nasal packing (p<0.001)* *Rebleeding within 24 hours of treatment was reported in 4.7% of the TXA group and 12.8% of the nasal packing group (p=0.034)* *Rebleeding within 7 days of treatment was reported in 2.8% of the TXA group and*	*No study flaws were found.* *Sample size calculation was performed and resulted in 91 patients needed. Investigators increased this number by 20% with the intent to enroll 110 patients in each group. Final enrollment was 109 in nasal packing and 107 in TXA group* *Randomization was done well. Attempted double blinding by having RN*

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			(nausea/vomiting and intolerance)	*11% of the nasal packing group (p=0.018)* *95.3% of the TXA group were discharged in 2 hours, compared to only 6.4% of the nasal packing group (p<0.001)* *On a 0-10 rating scale, patient satisfaction was higher in the TXA group (8.5 ± 1.7) than the nasal packing group (4.4 ± 1.8) (p<0.001)* *There was no statistical significance found between both groups with respect to complications.*	*prepare unmarked medications based on randomization. However, due to color, smell, etc. of medications, true blinding wasn't achieved.* *Very generalizable to the EMS setting as we can determine almost all inclusion criteria (with the exception of the INR), see this patient population frequently and can easily administer this medication using the same method.*
Zahed R. 2017	*124 Emergency Department patients who presented with anterior epistaxis and were on a prescribed antiplatelet drug*	*Randomized Control Trial* *LOE 1* *Topical TXA vs Anterior Nasal Packing*	*- Frequency of hemostasis within 10 minutes of treatment onset* *- Frequency of patients experiencing rebleeding within 24 hours after treatment* *- Frequency of patients experiencing rebleeding within 7 days after treatment* *- Patient time to discharge from the ED* *- Patient satisfaction*	*Within 10 minutes of treatment, 73% of TXA group achieved hemostasis compared to 29% of nasal packing (p<0.001)* *Rebleeding within 24 hours of treatment was reported in 5% of the TXA group and 10% of the nasal packing group (p=0.299)* *Rebleeding within 7 days of treatment was reported in*	*Good quality RCT with solid methodology.* *Sample size calculation was performed and resulted in 114 patients needed (57 per group). Investigators increased this number by 10% with the intent to enroll 124 total patients in each group. Final enrollment was 124 total; 62 in nasal packing and 62 in TXA groups respectfully.*

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				5% of the TXA group and 21% of the nasal packing group (p=0.007) *97% of the TXA group were discharged in 2 hours, compared to only 13% of the nasal packing group (p<0.001)* *On a 0-10 rating scale, patient satisfaction was higher in the TXA group (median 9, IQR 8-9.25) than the nasal packing group (median 4, IQR 3-5) (p<0.001)* *There was no statistical significance found between both groups with respect to complications.*	*Randomization was performed by computational methods by research nurse in an area inaccessible to the ED personnel. Due to obvious differences in # of plegets, consistency, colour, and smell, it was not possible to blind patients and physicians. However, analysts were blinded and were different than individuals from study investigators.* *It would have been interesting if they had stratified the treatment assignment by specific antiplatelet medication.* *This can be generalizable to our patient population, however currently we do not offer ANP with plegets as a treatment option. However, this new treatment option may also show similar improved benefit over our system's current standard of care; that of manual*

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					occlusion.

Comments: *Although my search strategy uncovered a substantial number of studies, a large portion of them assessed the value of topical TXA for bleeding in surgical setting. It appears as though in the surgical setting, TXA is a valued option with significant research supporting its use. Additionally, there were a number of studies that addressed other routes of administration of TXA, from TXA gel to intranasal spray. None of the research for these alternative routes showed any statistically significant improvement in outcomes.*

The two studies I reviewed for this CAT were both good quality randomized control trials with decent sample size and blinding as much as possible, given the treatment arms. Both assessed not only the cessation of hemostasis and frequency of rebleeding but also various other important outcomes such as time to discharge and patient satisfaction; all of which showed improvement with the treatment arm vs the control arm.

Finally, the most recent study I included also helped allay fears that can exist when administering an antifibrinolytic medication to a patient with potential antiplatelet medications already on board. The administration of TXA to these patients not only improved outcomes but had no adverse effects that could be attributed to the use of antiplatelet medications. This is important because it not only supports previous research of this treatment option, but also widens the potential patient population it can safely be used in.

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Consider: *Although the two included studies both showed excellent improvement in multiple outcomes when treating with TXA vs the control group, there are some limitations to applying this to current practice.*

First, the studies are based on Emergency Department patients rather than EMS, and although similar environments, the two cannot be assumed to be completely identical.

Second, the control group in both studies was that of anterior nasal packing, whereas our current standard of practice is simple manual occlusion. This may affect any potential improvement when using this care option compared to the reported results from the studies. Although the use of TXA may in fact show even greater improvement when compared to manual occlusion, rather than anterior nasal packing, we cannot accurately assume that from these studies and therefore more research is needed.

Clinical Bottom Line: *Tranexamic acid's ability as a highly efficacious antifibrinolytic medication has been well documented in the literature. It has shown excellent results in hemorrhage secondary to penetrating trauma as well as when applied topically in the surgical setting. More recently, research has proven its effectiveness in topical application for the emergency department epistaxis patient, however, it is still unclear if this can be applied to the prehospital patient and whether or not it will improve outcomes in that patient population.*

References:

Zahed, R., Jazayeri, M. H. M., Naderi, A., Naderpour, Z., Saeedi, M. (2017). *Topical Tranexamic Acid Compared With Anterior Nasal Packing for Treatment of Epistaxis in Patients Taking Antiplatelet Drugs: Randomized Controlled Trial. Academic Emergency Medicine, Accepted Manuscript*

Zahed, R., Moharamzadeh, P., AlizadehArasi, S., Ghasemi, A., Saeedi, M. (2013). *A new and rapid method for*

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epistaxis treatment using injectable form of tranexamic acid topically: a randomized controlled trial. American Journal of Emergency Medicine, 31 (9), 1389-92

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