



Original Research Article

Use of tranexemic acid on postoperative blood loss and transfusion requirements in patients undergoing total knee replacement

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ABSTRACT

Background: Knee replacement, similarly called as knee arthroplasty, is a clinical system to override the weight-bearing surfaces of the knee joint to alleviate misery and debilitation. Supreme knee overriding is normally associated with postoperative blood loss. The current examination was coordinated to evaluate the effect of the usage of tranexemic acid on postoperative blood loss and transfusion essentials in patients encountering absolute knee replacement.

Materials and Methods: The prospective study was conducted in Basaveswara Medical College and Hospital, Chitradurga and contained data of patients who experienced supreme knee replacement between February 2019 to January 2020. The effect of intra articular tranexamic acid on postoperative hemoglobin and number of blood units reinforced was noted.

Results: A total of 100 patients encountering knee overriding clinical methods were picked with 20(20%) men and 80(80%) women. The overall mean age was 61 years (41-85 years). Tranexamic acid was used in all the patients. Exactly when it was used, only 2 (2%) patients required blood transfusion. The typical fall in hemoglobin postoperatively was 0.76 gm/dl.

Conclusion: Intra-articular Tranexamic acid decreases the hard and fast blood loss and transfusion requirements in patients encountering total knee replacement.

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1. Introduction

Full scale knee replacement (TKR) is commonly related to postoperative blood loss.¹ Tranexamic destructive (TXA) is a medication used to treat or keep superfluous blood setback from noteworthy injury.^{2,3} Tranexamic destructive (TXA), a fake foe of fibrinolytic pro is about 7-10 times more grounded than epsilon-aminocaproic destructive and genuinely impedes the lysine-limiting site of plasminogen, plasmin, and tissue urokinase which hinders their relationship with fibrin.⁴⁻⁶ Different Authors have proposed successful intraarticular (IA) association of TXA before wound end to scale back the potential burdens related with the hazard of thrombotic events.⁷⁻⁹ This assessment was coordinated to survey the effect of the

utilization of TXA on postoperative blood hardship and transfusion requirements in patients encountering full scale knee replacement.

2. Materials and Methods

The prospective study was conducted in Basaveswara Medical College and Hospital, Chitradurga and included data of patients who experienced outright knee replacement between February 2019 to January 2020. Both the uneven and two-sided total knee replacement patients are associated with the assessment. Patients with adjustment knee and patients who encountered a couple of systems other by then outright knee replacement were dismissed.

Preoperatively if any patient taking ibuprofen or clopidogrel were instructed to hinder this platelet cutting down prescription three days before clinical strategy

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and this medicine was restarted 3 days after clinical methodology. An appropriate assessed tourniquet was applied in proximal thigh with pressure kept up at 300 torr. Clinical methodology was done using either standard medial parapatellar arthrotomy or subvastus approach. Hard cuts in Tibia, femur and patella were made using standard moves. Before proceeding to cleaned items, fragile tissue balance was checked. Wound was totally overwhelmed with customary saline and last implantation of fitting evaluated parts were done using bone cement. Every single observable vein inside the field were coagulated. Channel wasn't utilized notwithstanding. Intra articular TXA was given. Wound end was gotten out layers. Tourniquet was fell before skin end. Compressive Dressing was done.

3. Results

A whole of 78 patients were pondered, with females being 41 (52.5%) and guys 37(47.5%). The mean age was 61 years (41-85 years). The mean preoperative hemoglobin was 11.78 gm/dl and the mean postoperative hemoglobin was 11.23gm/dl. The mean fall in hemoglobin was 0.55 by calculating the difference between mean pre-op and mean post activity and 0.55 by taking mean of the impressive number of patients supreme fall in hemoglobin. Only 1 patient required blood transfusion post operatively.

4. Discussion

Tranexemic acid is more affordable and less allergenic than aprotinin and is more grounded than e-aminocaproic acid, its preferred⁴. After supreme knee replacement, the declared event of blood loss ranges from 500ml to 1500ml contingent upon patients and clinical technique variables.^{10–15} To the extent pharmacology, blood setback in full scale knee replacement are much of the time reduced by various antifibrinolytic authorities like e-aminocaproic acid, aprotinin and tranexemic acid. Ho KM, Ismail H., et al suggests that association of Tranexemic acid has lessened postoperative blood loss.¹⁶ In any case, concerns remain over the risk of thromboembolic complexities after essential association.^{17,18} Wong et al., done out an examination with 124 patients and uncovered on a very basic level reduced postoperative leaking after supreme knee arthroplasty when tranexemic acid was applied topically to the injury before closure.¹⁹

Akizuki et al., first declared powerful usage of tranexemic acid in orthopedic clinical technique in 1997, itemizing no postoperative blood loss in 42 coordinated proportional cementless tranexemic acid patients and 64 uneven cementless TKA patients.²⁰

Another examination in 2012 was performed by Mutsuzaki et al., during which they showed that hard and fast blood loss, total waste, mean transfusion volume, and transfusion rates were all lower when tranexemic acid was imbued through the channel after full scale

knee arthroplasty and thus the channel by then cut, as differentiated and not injecting tranexemic acid.²¹ Soni et al., saw that intra-articular association of tranexemic acid can correspondingly be gainful as a three-parcel IV routine in reducing intraoperative blood loss during hard and fast knee arthroplasty.²²

5. Conclusion

Intra-articular tranexamic acid reduces the total blood loss in patients encountering hard and fast knee replacement and besides prerequisite for the post usable blood transfusion is diminished.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Sehat KR, Evans RL, Newman JH. Right administration of blood transfusion should consider shrouded transfusion. *J Bone Joint Surg Br.* 2004;86:561–6.
2. British National Formulary (69 ed.). ; 2015. p. 170.
3. Impact of early tranexamic acid organization on mortality, hysterectomy, and different morbidities in ladies with baby blues drain: a worldwide, randomized, twofold visually impaired, fake treatment controlled preliminary. *Lancet.* 2017;389(10084):2105–16.
4. Hoylaerts M, Lijnen HR, D C. Studies on the system of the antifibrinolytic activity of tranexamic acid. *Biochim Biophys Acta.* 1981;673(1):75–85.
5. Wittmann FW, Ring PA. Blood transfusion related with Ring uncemented all out knee substitution: correlation among ceaseless and irregular pull seepage. *J R Soc Med.* 1984;77:556–8.
6. Horrow JC, Riper DV, Strong MD, Grunewald KE, Parmet JL. The portion reaction relationship of tranexamic acid. *Anesthesiol.* 1995;82:383–92.
7. Soni A, Saini R, An G. Examination among intravenous and intra-articular regimens of tranexamic acid in diminishing blood misfortune during all out knee arthroplasty. *J Arthroplast.* 2014;29:1525–7.
8. Patel JN, Spanyer JM, Smith LS. Examination of intravenous versus effective tranexamic acid in complete knee arthroplasty: a planned randomized investigation. *J Arthroplast.* 2014;29:1528–31.
9. Chen S, Wu K, Kong G. The adequacy of effective tranexamic acid in all out hip arthroplasty: a meta-investigation. *BMC Musculoskelet Disord.* 2016;17:81.
10. Mylod AG, France MP, Muser DE, Parsons JR. Perioperative blood transfusion related with complete knee arthroplasty. An examination of strategies performed with and without solidifying. *J Bone Joint Surg Am.* 1990;72:1010–2.
11. Burkart BC, Bourne RB, Rorabeck CH, Kirk PG, Nott L. The viability of tourniquet discharge in blood preservation after absolute knee arthroplasty. *Clin Orthop Relat Res.* 1994;299:147–52.
12. Karnezis TA, Stulberg SD, Wixson RL, Reilly P. The hemostatic impacts of desmopressin on patients who had all out joint arthroplasty. A twofold visually impaired randomized preliminary. *J Bone Joint Surg Am.* 1994;76(10):1545–50.
13. Goodnough LT, Verbrugge D, Marcus RE. The connection between hematocrit, blood lost, and blood bonded in all out knee substitution. Suggestions for postoperative blood rescue and reinfusion. *Am J Knee*

- Surg.* 1995;8:83–7.
14. Fragen RJ, Stulberg SD, Wixson R, Glisson S, Librojo E. Impact of ketorolac tromethamine on draining and on prerequisites for absence of pain after complete knee arthroplasty. *J Bone Joint Surg Am.* 1995;77:998–1002.
 15. Faunø P, Suomalainen O, Rehnberg V, Hansen TB, Krøner K, Soimakallio S. Prophylaxis for the counteraction of venous thromboembolism after complete knee arthroplasty. A correlation among unfractionated and low-molecularweight heparin. *J Bone Joint Surg Am.* 1994;76:1814–8.
 16. Ho KM, Ismail H. Use of Intravenous Tranexamic Acid to Reduce Allogeneic Blood Transfusion in Total Hip and Knee Arthroplasty: A Meta-analysis. *Anaesth Intensive Care.* 2003;31(5):529–37.
 17. Mannucci PM. Hemostatic medications. *N Engl J Med.* 1998;339(4):245–53.
 18. Raveendran R, Wong J. Tranexamic acid lessens blood bonding in careful patients while its impacts on thromboembolic occasions and mortality are dubious. *Evid Based Med.* 2012;.
 19. Wong J, Abrishami A, Beheiry HE, Mahomed NN, Davey JR, Gandhi R. Topical Application of Tranexamic Acid Reduces Postoperative Blood Loss in Total Knee Arthroplasty. *J Bone Joint Surg Am.* 2010;92(15):2503–13.
 20. Akizuki S, Yasukawa Y, Takizawa T. A new method of hemostasis for cementless total knee arthroplasty. *Bull Hosp Jt Dis.* 1997;56(4):222–4.
 21. Mutsuzaki H, Ikeda K. Intra-articular injection of tranexamic acid via a drain plus drain-clamping to reduce blood loss in cementless total knee arthroplasty. *J Orthop Surg Res.* 2012;7(1):32.
 22. Soni A, Saini R, Gulati A, Paul R, Bhatti S, Rajoli SR, et al. Comparison Between Intravenous and Intra-articular Regimens of Tranexamic Acid in Reducing Blood Loss During Total Knee Arthroplasty. *J Arthroplasty.* 2014;29(8):1525–7.

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