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Original Research Paper

Blood Loss By Use Of Intra-ArticularTranexamic Acid In Total Knee Replacement; A Cross Sectional Study.

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ABSTRACT:

Total knee arthroplasty (TKA) is one of the most common surgeries in orthopaedics today. Tranexamic acid (TXA) is an antifibrinolytic medication that can reduce perioperative blood loss in TKA. However, the best method of delivery has not been defined although topical intra-articular TXA (IA-TXA) may have a theoretical advantage as it is applied directly when and where it is needed to control bleeding. Aim: To find blood loss by use of intra-articular tranexamic acid in total knee replacement. Material and methods: A prospective observational study was carried out which included 40 patients undergoing TKR in the Department of Orthopaedic Surgery. Post-operative outcomes such as blood loss, Hb count (pre and post-operative), need of blood transfusion, etc. was studied in both groups. Results: In present study average age in years of patient was 63.6+8.4. In present study average blood volume of patient was 3.94+0.66, average HB in gm% of patient was 12.95+0.94, average HB in gm% on day 1 of patient was 11.54+0.94 and on day 3 was 10.94+0.89. In present study average blood loss in ml on day 1 of patient was 433.52+166.79 and on day 3 of patient was 741.66+275.34. Conclusion: Study demonstrate that the intra articular administration of tranexamic has good efficacy in reducing blood loss during total knee replacement surgery. With respect to avoiding blood transfusions, intra articular administration is efficacious. Additionally, intra articular administration controlled blood loss, without complications. Considering intra articular TXA works directly at the surgical site and has markedly decreased systemic absorption, intra articular application could be a rational choice.

Keywords: intra articular, tranexamic acid, total knee replacement

INTRODUCTION:

Total knee replacement (TKR) is a cost-effective and efficacious treatment modality for severe osteoarthritic knees. Growth in the proportion of obese population, combined with the increase in demand from an ageing population, will inevitably lead to a rise in the number of patients requiring TKR. This number is expected to increase five-fold by 2030. [(1)] Tranexamic acid (TXA) is an antifibrinolytic medication that can reduce perioperative blood loss in TKA. However, the best method of delivery has not been defined although topical intra-articular TXA (IA-TXA) may have a theoretical advantage as it is applied directly when and where it is needed to control bleeding. [(2)]Data were extracted and analyzed with the goal of discovering through meta-analysis if IA-TXA reduces blood loss, blood transfusions, and without increasing adverse events, especially thromboembolic events, compared with placebo. The frequency of blood transfusion and the number of units of blood transfused were significantly lower in the IA-TXA group. The risk of adverse events was not increased for IA-TXA versus placebo. Topical IA-TXA in primary, unilateral TKA successfully reduces blood loss and the frequency of blood transfusions. [(3,5)]In addition, it does not appear to increase the risk of thromboembolic adverse events. There is need for further research to determine the optimal dosage and the preferred delivery system of IA-TXA in TKA. [(6)] Despite several studies proving the efficacy of both intra-articular and intravenous TXA in reducing blood loss after TKR, the ideal route of administering TXA will remain a topic for ongoing debate and controversy in the upcoming years. [(7)] Present study was conducted to compare the efficacy of both intra-articular ranexamic acid in total knee replacement.

Aim: To find blood loss by use of intra-articular tranexamic acid in total knee replacement

MATERIAL AND METHODS:

Study design: Study design: Prospective Observational study

Study area: Patients who attended Orthopaedics Department of tertiary care hospital

Study population: Patients who underwent TKR under Department of Orthopaedics and who satisfied.

inclusion criteria.

Sample size: 40 cases.

Inclusion criteria:

• Age above 50 years

• Patients not suffering from any hemoglobinopathies

• Willing to participate and giving consent

Written informed consent was taken from patients, detailed medical history and clinical examination was done as per pre-designed and pre-tested proforma. Each patient underwent detailed orthopaedic examination. Patients suffering from osteoarthritis and those who were satisfying the inclusion criteria for total knee replacement were included in the study. Pre-op routine investigations were done & then patients underwent total knee replacement. All patients who underwent total knee replacement were given tranexamic acid for reducing blood loss. Post-operative outcomes such as blood loss, Hb count (pre and post-operative), need of blood transfusion, etc. were studied in all two groups and comparison between all two groups was done. Among group I patients IA TXA was given immediately after skin closure, 10 mL saline with TXA was infused in the joint. Among group II, IV TXA was given, half an hour before tourniquet inflation. 1gram TXA in 100 ml normal saline was used. No surgical drain was used. The tourniquet was not released until application of a compressive elastic bandage. Patients were allowed to flex the knee joint as soon as possible, and weight-bearing also was allowed on the second day after the surgery. For the prevention of DVT, INJ.ENOXAPARIN 40 mg subcutaneously was started 12 hrs pre-operatively and continued till day of discharge. On discharge the patient were prescribed TAB. RIVAROXABAN, 10 mg Once daily for 2 weeks followed by TAB, ECOSPRIN, 150 mg Once daily for4 weeks. Transfusion of one unit of packed red cell concentrate containing the standard 400 mL of red blood cells (RBCs; 48 ±2 g Hb) was indicated when Hb will be < 8 g/dL, or <10 g/dl with clinical evidence of acute anemia or any organ dysfunction that was caused by anemia. All data was collected and complied in Microsoft excel. Results of continuous (quantitative data) measurement were presented on Mean +/- SD (min-max) and result on categorical (qualitative data) measurements was presented in percentage and proportions (%).

RESULTS:

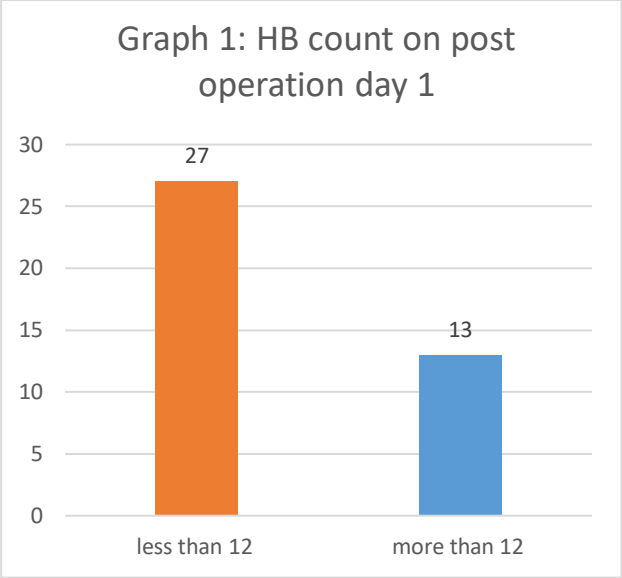
In present study the average age in years of patient was 63.6+8.4.

Table 1: Calculated blood volume distribution

Blood volume	Total
≤4	25
>4	15
Total	40

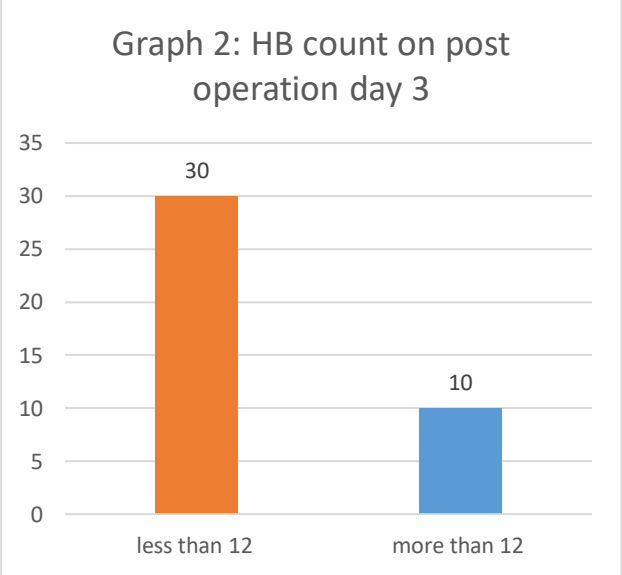
Average blood volume of patient was 3.94±0.66.
Average HB in gm% of patient was 12.95+0.94

Graph 1: Hb count on post operation day 1



Average HB in gm% on day 1 of patient was 11.54+0.94

Graph 2:Hb count on post operation day 3



Average HB in gm% on day 3 of patient was 10.94±0.89

Table 2: Calculated blood loss on post operation day 1

Average blood loss in ml on day 1 of patient was 433.52±166.79

Blood loss in ml	Total
≤200	2
201 to 400	14
401 to 600	21
>600	3
Total	40

Table 3: Calculated blood loss on post operation day 3

Average Blood loss in ml on day 3 of patient was 741.66±275.34

Blood loss in ml	Total
201 to 400	3
401 to 600	12
>600	25

Total	40

DISCUSSION:

In present study average age in years of patient was 63.6+8.4. Study by Tsukada et al [8] showed that mean age in years of was 72.5+6.9 and Deniz Cankaya et al [9] showed that mean age in years of was 66.1+7.1. In present study average blood volume of patient was 3.94±0.66. Duan Wang et al [10] showed that average blood volume of patient was 2.1±0.7. In present study average HB in gm% of patient was 12.95+0.94. Study by Tsukada et al [8] showed that mean Hb in gm% in was 13+1.3 and Duan Wang et al [10] showed that mean Hb of patients was 13.35+1.17. Lacko M et al [11] in their study showed that among patients was 13.8+ 0.9. In present study average HB in gm% on day 1 of patient was 11.54+0.94 and on day 3 was 10.94+0.89. Duan Wang et al [10] showed that mean Hb on day 1 of patients was 11.63+1.19 and on day 3 was 10.38+1.13. Paolo Adravanti et al [12] showed that mean Hb on day 1 of IA group was 11.5+1.2 and on day 3 was 11.1+1.2. In present study average blood loss in ml on day 1 of patient was 433.52±166.79 and on day 3 of patient was 741.66±275.34. Paolo Adravanti et al [12] showed that mean blood loss was 746.2+291.5 on day 1 Duan Wang et al [10] showed that calculated blood loss on day 3 was 1059.37±422.99mL .

CONCLUSION:

Study demonstrate that the intra articular administration of tranexamic has good efficacy in reducing blood loss during total knee replacement surgery. With respect to avoiding blood transfusions, intra articular administration is efficacious. Additionally, intra articular administration controlled blood loss, without complications. Considering intra articular TXA works directly at the surgical site and has markedly decreased systemic absorption, intra articular application could be a rational choice.

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