



Does tranexamic acid reduce blood loss and blood transfusion requirement in knee arthroplasty?

Traneksamik asit total diz artroplastisindeki kan kaybı ve kan transfüzyonu gereksinimi azaltır mı?

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Strong evidences which indicate that tranexamic acid reduces blood loss and blood transfusion requirement in patients who are scheduled for total knee arthroplasty are available. However, dose and method of administration, safety and side effects are still controversial issues. The effect of tranexamic acid on thromboembolic events and mortality is still unknown.

Key words: Blood loss; blood transfusion; knee arthroplasty; tranexamic acid.

Ameliyat olacak hastalarda traneksamik asidin total diz artroplastisindeki kan kaybı ve kan transfüzyonu gereksinimini azalttığına ilişkin güçlü deliller vardır. Bununla birlikte, doz ve verilmiş yöntemi, güvenlik ve yan etkiler konuları tartışmalıdır. Traneksamik asidin tromboembolik olaylar ve mortalite üzerine etkisi henüz netleşmemiştir.

Anahtar sözcükler: Kan kaybı; kan transfüzyonu; diz artroplastisi; traneksamik asit.

There is strong evidence that tranexamic acid reduces blood loss and blood transfusion requirement in surgical patients.^[1-4]

However, dose and method of administration, safety and side effects are still controversial issues.^[5-7]

Does tranexamic acid reduce blood loss and blood transfusion requirement in knee arthroplasty?

Yes, the evidence that tranexamic acid reduces blood loss and blood transfusion requirement in knee arthroplasty is strong. The retrospective or prospective randomized controlled trials as well as systematic reviews or meta-analyses have shown that tranexamic acid reduces blood loss and blood transfusion requirement in knee arthroplasty.^[1,3,7]

How does tranexamic acid reduce blood loss?

A pneumatic tourniquet can reduce intraoperative blood loss; however, bleeding is often extensive in total knee arthroplasty during postoperative period.^[8-10] The use of a pneumatic tourniquet is associated with increased fibrinolytic activity in animal models and in patients having orthopaedic surgery.^[11,12]

The increased fibrinolytic activity may increase blood loss after knee arthroplasty during early postoperative period.^[5] Tranexamic acid reduces postoperative blood loss inhibiting fibrinolytic activity after knee arthroplasty.^[5]

What is the optimal dose and method of administration of tranexamic acid?

It is still controversial. There are several studies reporting different protocols including one intraoperative dose of 10 mg/kg, one intraoperative dose of 15 mg/kg, one intraoperative dose of 20 mg/kg, and two intraoperative doses of 10 mg/kg, given three hours apart.^[5,13-15]

The administration route and the timing of the application are also controversial. There are several studies reporting different protocols including intravenous injection one given preoperatively and one on deflation of the tourniquet,^[16] or intravenously (10 mg/kg) 10 minutes before inflation of the tourniquet and every three hours postoperatively and orally (250 mg/capsule; two capsules three times daily) for five days,^[3] one intravenous injection before deflation

of the tourniquet,^[17] two injections given preoperatively and intraoperatively,^[18] 1.5 or 3.0 g of tranexamic acid in 100 mL of normal saline solution applied into the joint for five minutes at the end of surgery.^[6]

A recent prospective randomized controlled study revealed that a three-dose regimen (intraoperative dose given before tourniquet deflation, additional preoperative dose, and additional postoperative dose) produced the most effective reduction in blood loss.^[4]

Is tranexamic acid safe in reducing blood loss in total knee arthroplasty?

Conflicting reports have been published on the safety of tranexamic acid in reducing postoperative blood loss in total knee arthroplasty. Tranexamic acid administration seems to be an effective and safe technique in reducing blood transfusion requirement and blood loss in revision total knee arthroplasty.^[19] A recent meta-analysis shows that the use of tranexamic acid for the patients undergoing total knee arthroplasty is effective and safe for the reduction of blood loss.^[7]

However, uncertainties about its effect on thromboembolic events and mortality persist in surgical patients as indicated in another systematic review and cumulative meta-analysis.^[20]

Further clinical trials of tranexamic acid in heterogeneous groups of surgical patients are necessary to resolve the uncertainties about the effects on thromboembolic events and mortality. Hence, the patients should be instructed on this evidence, so that they can make a choice before surgery.

Declaration of conflicting interests

The author declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The author received no financial support for the research and/or authorship of this article.

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