Tranexamic acid in total knee replacement surgeries: Some concerns

Sir,

We read with great interest the recent article by Gautam *et al*.[1] on tranexamic acid (TXA) and blood loss during total knee replacement surgeries (TKR). However, we have a few concerns in interpreting the results of the same.

Firstly, author claims it to be the first of its kind study in North Indian population. But there is ample literature on the effect of TXA on reducing the blood loss during orthopaedic surgeries. Infact, a similar study was conducted by us on north Indian population only, also published in *Indian Journal of Anaesthesia* way back in 2009.[2]

Secondly, the fibrinolysis activation is a cascade phenomenon, which is most easily inhibited in its earlier phases. Once it is set in, the efficacy of TXA markedly decreases. It is surprising that, the authors have given TXA before deflation of tourniquet (after the surgery is complete) and still were able to show a marked reduction in the blood loss (more than reported in literature). The literature suggests that the TXA is most effective once it is given before the incision.[3-5] Moreover, the fibrinolytic response after trauma is biphasic with an increased activity during the first hours, followed by a shutdown that peaks at about 24 hours. Thus, suppression of fibrinolysis from the beginning of the operation may be more effective than only at the time of the peak of hyperfibrinolysis later. So it would have been better if the drug is administered at the start of surgery (before tourniquet inflation) and then continued perioperatively.

Thirdly, the temperature of the theatre is generally kept lower (around 20 degrees) in joint replacement surgeries. Such a low temperature can lead to hypothermia, platelet dysfunction, coagulation abnormalities and increases perioperative bleeding.[6] So, one should monitor core temperature and take measures (forced air warming, warm fluids, etc.) to minimise the induced hypothermia. But neither OT temperature nor core temperature were monitored. Moreover, no measures were taken to reduce hypothermia. This may have been a confounding variable and may have resulted in a greater blood loss in the control group patients.

Fourthly, the duration of tourniquet time and timing of its deflation (whether it was deflated before closing or after bandaging) is not mentioned. This may also have affected the results because the bleeding is more if tourniquet is deflated intraoperatively. Moreover, the prolonged use of tourniquet can increase the

blood loss. The probable reason for this is increased fibrinolysis associated with tourniquet use.[7]

Fifthly, the type of TK procedure done, also affects the blood loss (cemented or noncemented, primary/secondary or whether femoral plug was used?). Raut *et al*. in their study observed that postoperative blood loss is lower in TKA after using cemented press fit condylar prosthesis and a femoral intramedullary plug.[8] But there is no mention of the type and whether they were equally distributed in the two groups. This may also have affected the blood loss occurring and the results in the two groups.

Sixthly, there is a definitive risk of thromboembolism with use of TXA especially in patients of TKR (who maybe immobilised for a long time). But there is neither a mention of this fatal complication in the article nor the patients were given low molecular heparin prophylactically. These patients should have been screened for the DVT clinically, biochemically or radio logically (Doppler ultrasound) for timely detection and subsequent management.

The patients undergoing orthopaedic surgeries complain of pain in the postoperative period. Generally, a combination of postoperative epidural infusions/infusion through femoral catheters and/or intravenous analgesics is given to control the severe pain. But in the study there is no postoperative analgesia being given or else they have forgotten to mention this very important aspect of this particular surgery (surgery was done under single shot spinal without additive).

Finally, the blood loss greater than 15% was replaced with whole blood which is not evidence based. The indications of the transfusion of whole blood are very few now days. Packed cells should have been preferred instead.

Hence, we urge caution in interpreting the results of the study because of the multiple confounding variables involved.

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Announcement

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All the members of ISA are requested to obtain their Bar coded ID card to participate in election process, to be held during ISA AGBM 2012 at Indore during ISACON 2012 on 28th December 2012.

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