EDITORIAL

Tranexamic Acid in Total Joint Arthroplasty: Efficacy and Safety

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Despite improvements in surgical and anesthetic techniques, total joint arthroplasty (TJA) is still associated with substantial blood loss and postoperative anemia (1). A considerable portion of patients with postoperative anemia require blood transfusion, which has been shown to negatively affect the outcome of TJA and predisposes patients to development of surgical site infection and periprosthetic joint infection (2,3).

Various blood conservation strategies have been developed to reduce the need for allogeneic blood transfusion in patients undergoing TJA (3). Administration of tranexamic acid (TA) is one of the most effective (4). TA is a synthetic lysine derivative drug that binds to plasminogen and prevents the interaction of plasminogen and fibrin, eventually leading to dissolution of fibrin clots (5).

There is level I evidence supporting the need for allogeneic transfusion in primary total hip and total knee arthroplasties, and the efficacy of TA in particular for reducing blood loss (6,7). TA is also effective in reducing the need for blood transfusion in bilateral TJA and revision surgeries (4). Moreover, when TA is used, other blood conservation strategies are rendered unnecessary (4).

The drug can be used intravenously in a weight-based manner (10-20 mg/kg), or administered 1gm intravenously at the start of surgery and 1gm intravenously at the end of surgery, or up to 3 hours after the first dose. TA can also be applied topically to the surgical site to provide hemostasis, or it can be injected intra-articularly (1g in 50 cc saline). Although oral administration of TA (25 mg/kg, maximum 2g, two hours preoperatively) has also been reported to be effective, it is not routinely used in TJA patients and intravenous and topical methods are preferred (4).

Despite the proven efficacy of the use of TA in TJA, there are still some concerns about the development of venous thromboembolism (VTE) after TA is used. Since VTE following TJA is relatively rare, the majority of studies that evaluated the efficacy of TA are underpowered for evaluation of its safety. In a recent study by Poeran et al. using a large national database including 872,416 patients who had total hip or knee arthroplasty, the authors suggested that TA is effective in reducing the need for blood transfusions while not increasing the risk of VTE and renal complications (8). However, it is still advised that patients with cardiac stents and previous thromboembolic events including ischemic stroke not be administered TA. TA can also cause gastrointestinal disturbance and its dose needs to be adjusted in patients with renal impairment (5).

In conclusion, administration of TA in TJA patient is a cost-effective blood conservation strategy and there is strong evidence to support the efficacy and safety of the drug in reducing blood loss and transfusion in TJA patients. Given the adverse effects of allogeneic blood transfusion on the outcome of TJA, administration of TA should be considered in patients with no contraindication for its use.

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