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Should We Use Antifibrinolytic Agents in Lower limb Arthroplasty?

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Editorial Note

In the United States, there are more than 200,000 total hip replacements [1] and 400,000 total knee replacements [2] performed annually. Continued research is undertaken to improve outcomes and decrease complications of these common procedures. Blood loss may be significant, requiring allogenic blood transfusion, which carries risks of immunological reactions, haemolysis, renal failure and infections [3,4] In an attempt to stem blood loss, anti-fibrinolytic agents as aprotinin, tranexamic acid and epsilon-aminocaproic acid have been used to reduce dissolution of blood clots. However, they are not widely used in many centres for the fear of developing thrombosis, and their use remains controversial in many orthopedic centres. The presence of multiple randomized control studies helps clarify the myths and facts around this area.

Seven meta-analysis and systematic reviews investigated the use of anti-fibrinolytic agents in total hip and knee arthoplasty. Ho et al. [5], identified 12 randomized control trials that compared the use of tranexamic acid to placebo in patients who received total hip or knee replacements. Tranexamic acid reduced the proportion of patients requiring blood transfusion, total blood loss, and total number of units of blood transfused. Meanwhile, tranexamic acid did not increase the risk of thrombosis. Gill et al. [6], investigated 13 randomized trials to identify whether antifibrinolytics significantly reduced blood loss and compared aprotinin to tranexamic acid. Anti-fibrionolytic agents were effective in reducing blood loss. Aprotinin alone was significantly effective in revision total hip replacements. Zuffery et al. [7], evaluated whether intravenous antifibrinolytics, when compared with placebo, reduced transfusion requirement in patients undergoing orthopedic surgery and whether it increased the risk of thromboembolism. The authors identified 43 randomized controlled trials in total hip and knee arthroplasty, spine fusion, musculoskeletal sepsis, and tumor surgery. Aprotinin, tranexamic acid and epsilon-aminocaproic acid were compared as anti-fibrinolytic agents. Aprotinin and tranexamic acid significantly reduced the proportion of patients requiring blood transfusion. Epsilon-aminocaproic acid was found ineffective. They were unable to draw a conclusion to the safety of these agents. Kagoma et al. [8], identified 29 randomized control trials that compared anti-fibrinolytic agents to evaluate their safety. They found that these agents reduced blood loss and the need for transfusion. There was not enough evidence to conclude that it did not increase the risk of thromboembolic complications. Sukeik et al. [9], examined 11 randomized control trials evaluating the efficiency of tranexamic acid in primary total hip replacements. The use of tranexamic acid reduced intra-operative blood loss, postoperative blood loss and significant reduction in the proportion of patients requiring blood transfusion. There were no significant differences in deep venous thrombosis, pulmonary embolism or infection rates among the study groups. Cid et al. [10], identified 9 randomized control studies that compared the use of tranexamic acid with placebo in total knee replacements. Tranexamic acid significantly reduced the proportion of patients requiring blood transfusion and the number of transfusions per patient when compared with patients who received placebo. Alshryda et al. [11], investigated 19 randomized control trials that used tranexamic acid in primary knee replacements. Tranexamic acid led to significant reduction in the proportion of patients requiring blood transfusion and reduced total blood loss. The meta-analysis concluded that there was no evidence to support an increased risk of deep venous thrombosis or pulmonary embolism due to tranexamic acid.

In conclusion, there is good evidence to support using aprotinin and tranexamic acid to reduce blood loss in primary total hip and knee replacements. Recent randomized control trials show these agents do not increase thromboembolic events. There still remains a need for large multi-centred randomised trials to establish this.

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