Inadequate methodology renders results on the use of tranexamic acid inconclusive

Patrice Forget • Irina Grosu • Emmanuel Thienpont

Received: 8 February 2013 / Accepted: 28 March 2013 / Published online: 25 April 2013
© Springer-Verlag Berlin Heidelberg 2013

Sir,

With great interest we read the recent article from Iwai et al. entitled "Repeat-dose intravenous tranexamic acid further decreases blood loss in total knee arthroplasty" [1]. The authors report on the use of tranexamic acid to reduce the rate of peri-operative blood transfusions in patients undergoing total knee arthroplasty (TKA). We agree fully with the authors that the development of strategies to reduce blood loss and the rate of peri-operative transfusions is imperative in modern TKA surgery. However, we have some concerns related to the published work.

First, we wonder if the authors agree that performing 78 consecutive patients in a 20-month period should be considered as a low volume TKA practice and that this can be reflected in their operating times of 140.7 (± 17.5) to 145.7 (± 18.8) minutes. We reviewed our operating times for the last 400 consecutive cases last year and came up with 89 (± 11) minutes in patients with a substantially higher BMI of 30 (± 3) than in the article. In our opinion longer surgical times and less routine during the procedure can increase blood loss during TKA. For example, we wondered if the surgical haemostasis after tourniquet deflation was performed before placing the polyethylene and giving access to the posterior capsule and the lateral genicular artery or if the polyethylene was already in place and no posterior access was possible.

Second, we wonder if the three study groups were tested for type I and type II errors and if the size of the groups can be considered significant compared to previously published

papers [2, 3]. Power analysis based on a predefined hypothesis should be reported in all the prospective studies. Moreover, it must be stated that this observational study included more than one change in the practice (i.e. the use of TXA but also autologous donation) in patients operated upon over different periods. Consequently, there is a high risk of bias linked to this suboptimal study design.

Third, we would like to know what the anaesthetic technique was used and the body temperature of the patients were [4].

Fourth, we wonder if the authors agree that allowing the surgeon (ST) decide if patients with acute anaemia symptoms need transfusion induces a significant bias in a consecutive series study.

Fifth, we would like to know if we could obtain more information about the intra-operative blood loss measurements? Was this suction collected blood and weighed sponges? Or was this just a visual estimation?

Sixth, what would be the clinical advantage of this study since the authors demonstrate that none of the groups needed allogenic transfusion?

Seventh, why was no auto-transfusion collection system used in the twice-TXA group, which signals an important bias again?

Eighth, do the authors agree that their rather late use of enoxaparin (36 hours after surgery) is unusual as a DVT prevention protocol and that it is responsible for the high rates of DVT observed on day seven, as well as an extremely high PE rate of 3 % in the control group?

And finally, how do they explain the difference in results compared with the results of Maniar et al. [3]?

As a consequence of our concerns, although we do not discuss the validity of the results of the authors, we argue that these results cannot be extrapolated to other centres.

P. Forget (✉) • I. Grosu • E. Thienpont
Cliniques universitaires Saint-Luc, Université catholique de Louvain, av. Hippocrate, 10, B-1200, Brussels, Belgium
e-mail: forgetpatrice@yahoo.fr

References

1. Iwai T, Tsuji S, Tomita T, Sugamoto K, Hideki Y, Hamada M (2013) Repeat-dose intravenous tranexamic acid further decreases blood loss in total knee arthroplasty. *Int Orthop* 37(3): 441–445
2. Tanaka N, Sakahashi H, Sato E, Hirose K, Ishima T, Ishii S (2001) Timing of the administration of tranexamic acid for maximum reduction in blood loss in arthroplasty of the knee. *J Bone Joint Surg Br* 83:702–705
3. Maniar RN, Kumar G, Singhi T, Nayak RM, Maniar PR (2012) Most effective regimen of tranexamic acid in knee arthroplasty: a prospective randomized controlled study in 240 patients. *Clin Orthop Relat Res* 470:2605–2612
4. Rajagopalan S, Mascha E, Na J, Sessler DI (2008) The effects of mild perioperative hypothermia on blood loss and transfusion requirement. *Anaesthesiol* 108:71–77