LETTER TO THE EDITOR

Nocturnal Infusion of Low-dose Dexmedetomidine and Propofol for Prevention of Delirium Occurring in the ICU after Hip Fracture Surgery in Elderly Patients

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Introduction

Ekkapat et al.[1] evaluated the efficacy of propofol and dexmedetomidine for the prevention of postoperative delirium (POD) during the ICU stay by carrying out a randomized controlled trial in 108 elderly patients who underwent elective hip fracture surgery and were admitted to the ICU after extubation and showed that a nocturnal infusion of low-dose propofol or dexmedetomidine did not decrease the incidence of POD. But, in this study, several methodological issues and potential confounders may have influenced the authors' conclusions.

First, the authors described that the sample size was calculated based on a 27.7% incidence of POD following the hip surgery reported in previous work, and a total of 111 patients with 37 patients in each group were needed when a 10% dropout rate was considered. However, they did not provide the assumed effector, the power of trial (commonly set between 80 and 90%), and type I statistical error (usefully set $\alpha = 0.05$), which are the essential components of sample size calculation in a randomized controlled trial.[2] Given the lack of these needed basic assumptions, we cannot determine whether the calculated sample size in this study has enough power to identify significant between-group differences for primary outcome.

Second, the objects of this study were elderly patients with an average age of 81.4 years undergoing hip fracture surgery, who are at a greater risk of developing POD.[3] However, the overall incidence of POD reported in this study was 12.0%, which is far lower than the findings of other works.[3] Other than the patients with a high risk of POD were excluded from the study, we noted that the studied drugs were given from 8 p.m. to 6 a.m. each day during the ICU stay. One of our main concerns is that the time points of delirium monitoring in this study, that is, before the operation, 1 hour before and after the studied drug or placebo administration, and then every 12 hours until discharge from the ICU, are not in agreement with 2017 guideline recommendations from the European Society of Anaesthesiology.[4] As POD can occur soon after emergence from anesthesia, screening should start as early as the emergence is completed. Furthermore, delirium that occurred in the period from the completion of emergence to 7 p.m. on surgery day (1 hour before the first administration of the studied drug) should have been included in the results. In addition, the authors used a 12-hour interval for delirium screening, that is, the Confusion Assessment Method for the ICU form interview was performed at 7 p.m. and 7 a.m. each day. As POD is a fluctuating condition that frequently manifests late at night,[3] it may be missed with the Confusion Assessment Method for the ICU form interviews only at these time points. We are concerned that these design limitations would have greatly underestimated the actual incidence of POD in this study.

Finally, other than a single-injection fascia iliaca block with levobupivacaine, patient-controlled analgesia with intravenous fentanyl was also used for postoperative pain control. The postoperative fentanyl consumption was not significantly different among the three groups but the readers were not clearly provided whether the three groups were comparable with respect to postoperative pain levels each day. Available evidence indicates that the severity and duration of postoperative pain are significantly associated with the increased risks of POD in elderly patients who underwent elective hip fracture surgery.[3,5] To differentiate the actual effect of one intervention on the primary outcome in a randomized controlled trial, all other factors that can influence the primary outcome measurement must be standardized to avoid potential biases. Thus, we argue that any unbalanced postoperative pain control in three groups may have biased the incidence of POD reported in this study.

Author Contributions

All authors conceived the article. NC drafted the initial manuscript. All authors provided further critique and refinement. All authors provided final approval for submission.

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References

1. Ekkapat G, Kampitak W, Theerasuwipakorn N, Kittipongpattana J, Engsusophon P, Phannajit J, et al. A comparison of efficacy between low-dose dexmedetomidine and propofol for prophylaxis of postoperative delirium in elderly patients undergoing hip fracture surgery: A randomized controlled trial. Indian J Crit Care Med 2024;28(5):467–474. DOI: 10.5005/jp-journals-10071-24710.
2. Abdulatif M, Mukhtar A, Obayah G. Pitfalls in reporting sample size calculation in randomized controlled trials published in leading anaesthesia journals: A systematic review. Br J Anaesth 2015;115(5):699–707. DOI: 10.1093/bja/aev166.
3. Martocchia A, Curto M, Comite F, Scaccianoce S, Girardi P, Ferracuti S, et al; Orthogeriatric Group. The prevention and treatment of delirium in elderly patients following hip fracture surgery. Recent Pat CNS Drug Discov 2015;10(1):55–64. DOI: 10.2174/1574889810666150216152624.
4. Aldecoa C, Bettelli G, Bilotta F, Sanders RD, Audisio R, Borozdina A, et al. European Society of Anaesthesiology evidence-based and consensus-based guideline on postoperative delirium. Eur J Anaesthesiol 2017;34(4):192–214. DOI: 10.1097/EJA.0000000000000594
5. Morrison RS, Magaziner J, Gilbert M, Koval KJ, McLaughlin MA, Orosz G, et al. Relationship between pain and opioid analgesics on the development of delirium following hip fracture. J Gerontol A Biol Sci Med Sci 2003;58(1):76–81. DOI: 10.1093/gerona/58.1.m76.