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CORRESPONDENCE

Does the method of anesthesia really affect outcomes and survival after total joint replacement?

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To the Editor,

We were greatly interested in the recent article by Chen *et al.*[1] assessing the effects of anesthesia methods on patient outcomes and long-term survival after total joint replacement (TJR). The authors showed that, compared with patients given general anesthesia, patients given neuraxial anesthesia had better long-term survival (58.2% *vs* 57.3%, respectively; $P = 0.009$), shorter length of hospital stay (8 [7-10] days *vs* 8 [6-10] days, respectively; $P = 0.024$) and lower hospital treatment costs ($4,079 [3,805-4,444] *vs* $4,113 [3,812-4,568], respectively; $P < 0.001$). The strength of this retrospective nationwide population-based study is the use of Taiwan's National Health Insurance Database which includes both large numbers of patients undergoing TJR and many known factors affecting the postoperative outcomes of such surgical patients. Propensity-score-matching was used to reduce possible effects of confounders on study endpoints. Nevertheless, one shortcoming of propensity-score-matching is that patients who cannot be matched are excluded from analysis. The excluded patients tend to be both the sickest and the healthiest patients, leaving only the patients with moderate morbidities for group comparison.[2] This would limit generalizability of the results. For example, before propensity-score-matching in this study, patients given general anesthesia had a higher Charlson comorbidity index score, more congestive heart failure, and mild liver disease, whereas patients given neuraxial anesthesia were notably older and had more myocardial infarction and chronic obstructive pulmonary disease. To generate two propensity-score-matched subgroups, 4.8% of patients given general anesthesia and 42.9% of patients given neuraxial anesthesia were excluded. Furthermore, the National Health Insurance Database used in this study does not include data that can potentially influence postoperative outcomes and survival, including the patients' American Society of Anesthesiologists physical status classification, preoperative hemoglobin levels, perioperative cardiac medications, preoperative functional status, and surgical complications.[3] This can further decrease the accuracy and inferences of propensity-score-matched subgroups adjusted for potential confounders.

In this retrospective study, we were not provided with the details of anesthesia and perioperative management. Consequently, it is difficult to estimate the extent of influence that anesthesiologists' interventions might have on postoperative outcomes and long-term survival. Actually, in clinical practice, anesthesiologists would have selected anesthetic methods based on patients' baseline characteristics and pre-existing mobidities. Furthermore, intraoperative blood loss, transfusion, and hemodynamic instability have also been independently associated with postoperative outcomes and mortality of patients with noncardiac surgery.[4] In addition, a single-centre analysis of 1,998 patients undergoing TJR shows that there are significant differences in mortality risk factors between early and late periods after surgery. Early mortality, which lasts about one month, is most likely related to the surgical procedure and perioperative management; however, longer-term mortality primarily

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represents the natural process of aging or potential diseases.[5]

It is generally thought that randomized controlled trials remain the gold standard for the evaluation of any treatment. Considering the retrospective nature of this study, we argue that large-scale randomized controlled clinical trials are still required to determine the association of neuraxial anesthesia with improved postoperative outcomes and long-term survival. If further studies show consistent beneficial effects of neuraxial anesthesia on postoperative outcomes and long-term survival of patients undergoing TJR, the implications for practice are immense.

Competing interests None declared.

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