Authors have nothing to disclose with regard to commercial support.

β -BLOCKERS IN AORTIC VALVE SURGERY: BETA SAFE THAN SORRY?

To the Editor:

We recently read with interest the article by Schubert and colleagues¹ on β -blocker use in patients undergoing aortic valve replacement surgery. This study is provocative and timely, given the increased emphasis on quality reporting in cardiac surgery and recent uncertainties about perioperative β -blocker use. In their analysis, Schubert and colleagues¹ found that patients taking β -blockers had increased risks of postoperative atrial fibrillation, allogeneic transfusion, and renal failure requiring dialysis. These findings should be interpreted cautiously for several reasons.

First, Schubert and colleagues¹ analyzed 19 study outcomes, which substantially increases the probability of a false-positive finding. When 20 statistical comparisons are made, the incidence of type 1 error, finding a significant difference that does not actually exist, is 64%.² Considering the study's findings from a Bayesian perspective, it is unlikely that preoperative β -blocker use actually increases postoperative atrial fibrillation.

Second, Schubert and colleagues¹ did not have data on β_1 selectivity. Because β -blockers have diverse pharmacology, categorizing them together almost certainly introduces bias. For example, nebivolol has 40:1 β_1 to β_2 selectivity, whereas carvedilol has 0.6:1.³ Drugs that have β_1 selectivity are associated with better perioperative outcomes, but they tend to be more expensive and less prescribed.⁴ Alternatively, blockade of β_2 receptors reduces renal blood flow and cerebral oxygen delivery, particularly in the setting of hemodilution.⁵ If a high percentage of patients in the study of Schubert and colleagues¹ received nonselective β -blockers, this could explain the study's outcomes; however, it may also limit its generalizability, because β -blocker prescribing practices change with time.

Finally, the Society of Thoracic Surgeons definition for preoperative β -blocker use is too narrow to draw

meaningful conclusions from a large, multicenter database. The Society of Thoracic Surgeons defines preoperative β -blocker use as receiving any β -blocker within 24 hours of surgery. There is no accounting for whether β -blocker use was long-standing or initiated just before surgery. This is important, because long-term β -blocker use is more likely to be beneficial in patients with severe aortic stenosis than a single dose of a β -blocker given just before surgery.

In summary, the study by Schubert and colleagues¹ highlights the need for more studies on β -blockers in cardiac surgery. It has significant limitations, however, which need to be considered before drawing general conclusions about β -blocker use in patients with aortic stenosis who require aortic valve replacement surgery.

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<https://doi.org/10.1016/j.jtcvs.2019.05.060>