

Application of Dexmedetomidine in Cardiopulmonary Bypass Prefilling and Several Confounding Factors

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Dear Editor

I read with interest the article, titled “Application of Dexmedetomidine in Cardiopulmonary Bypass Prefilling” by Wang et al., recently published in *Dose-Response*.¹ The highly-selective alpha-2 adrenoceptor agonist dexmedetomidine is widely used during the perioperative period to provide sedation and analgesia, for reduction of intraoperative stress, and to decrease the amount of anesthetic and opioid required.² The following comments, which may contribute to the bias in this study, should be considered while interpreting the results.¹ First, surgical trauma, myocardial reperfusion, and cardiopulmonary bypass are accompanied by open heart surgery, which induces an inflammatory response with release of proinflammatory cytokines, including interleukin-6, and produces reactive oxygen species contributing to form malondialdehyde.³ Thus, the following factors should be described in this study³: 1) the aortic cross-clamping time, kind of open heart surgery, and cardiopulmonary bypass time; 2) preoperative and intraoperative medications, including cardiovascular drugs (calcium channel blocker, beta-blocker, diuretic, nitroglycerin, angiotensin converting enzyme inhibitor, angiotensin receptor blocker, statin, dopamine, phenylephrine); and 3) medical history. The difference in these factors between the 2 groups may greatly affect the hemodynamic changes, inflammatory response, and myocardial injury, thus becoming a confounding factor in this study. This study mentioned all types of surgery in all 60 patients included in the 2 groups but did not describe the details of surgery in each group.¹ Therefore, the above-mentioned factors should be considered to reduce confounding bias.¹ Second, linear-mixed effect model is more appropriate than Fisher exact test to analyze the effect of dexmedetomidine and normal saline on the hemodynamic changes, cardiac troponin I, interleukin-6, malondialdehyde, and tumor necrosis factor- α at different times.⁴ Third, although the dosage of anesthetic (propofol and midazolam) used in this study was

less in dexmedetomidine group than in the normal saline group, the criteria of administration of propofol and midazolam used in this study should be described.¹ This study reported that intraoperative blood pressure during cardiopulmonary bypass was lower in the dexmedetomidine group than in the normal saline group.¹ However, the pump flow and the magnitude of hemodilution during cardiopulmonary bypass in both groups should be described, because intraoperative blood pressure during cardiopulmonary bypass is mainly determined by pump flow and peripheral resistance associated with hemodilution.⁵ The volume and composition of priming solution, which was mixed with dexmedetomidine, should be also described, because large doses of dexmedetomidine produce hypertension via the activation of alpha-2 adrenoceptor in the vascular smooth muscle.⁶⁻⁸ Moreover, the type and incidence of preoperative arrhythmia and the type of postoperative arrhythmia should be mentioned.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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