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CORRESPONDENCE

Letters to the Editor

Cardioprotection by Volatile Anesthetics in Noncardiac Surgery? No, Not Yet At Least

In the recently published article by Fleisher et al. (1), the authors advise using volatile anesthetics as cardioprotective agents in patients at risk for myocardial ischemia undergoing noncardiac surgery. These drugs have indeed shown marked cardioprotective properties in cardiac surgery, reducing post-operative mortality and myocardial infarction rate when compared with total intravenous anesthesia (2).

No study to date has allowed these interesting results to be translated in noncardiac surgery settings. A recent meta-analysis including more than 80 randomized controlled studies in which volatile anesthetics were compared with total intravenous anesthesia in noncardiac surgery highlighted the complete lack of published randomized clinical trials reporting data regarding postoperative mortality or cardiac complications after noncardiac surgery (3), which indicates that cardioprotection by halogenated anesthetics in noncardiac surgery is a new and interesting subject that deserves further study.

Because the authors of the guidelines suggest a class of evidence IIA, level B ("some conflicting evidence from single randomized trial or non-randomized studies"), we would appreciate knowing which article(s) provided the evidence to state that "it can be beneficial to use volatile anesthetic agents during noncardiac surgery for the maintenance of general anesthesia in hemodynamically stable patients at risk for myocardial ischemia."

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Reply

There is intense interest in the actions of volatile anesthetics agents to pre- and post-condition myocardium against injury after myocardial ischemia and reperfusion. Anesthetic pre-conditioning was first demonstrated in animal models in 1997 (1,2) and in patients undergoing coronary artery bypass graft surgery in 1999 (3). The American College of Cardiology/American Heart Association 2007 Guidelines on Perioperative Cardiovascular Evaluation and Care for Noncardiac Surgery (4) summarize the findings of 15 randomized clinical trials in patients undergoing coronary artery bypass graft surgery demonstrating that volatile anesthetic agents decrease troponin release and enhance left ventricular function compared with several intravenous anesthetics. Studies designed to evaluate the efficacy of anesthetic pre- or post-conditioning against myocardial injury have been conducted in patients undergoing cardiac surgery because the timing and duration of the myocardial ischemic stimulus is relatively well defined. In addition, the majority of these investigations controlled for important variables that could influence anesthetic cardioprotection, such as by discontinuing sulfonylurea hypoglycemic agents that block anesthetic pre- and post-conditioning. The data indicate that volatile anesthetic agents are protective against myocardial ischemia/reperfusion injury and can likely be generalized to patients with coronary artery disease undergoing noncardiac surgery. To date, there have been no published studies specifically designed to assess the efficacy of anesthetic pre- or post-conditioning against myocardial injury in patients undergoing noncardiac surgery. Also, volatile anesthetics produce important negative inotropic effects, and the risks and benefits of these drugs in hemodynamically unstable patients are unclear. There is a great need for further investigation in this area. The conduct of adequately powered and well-controlled studies of anesthetic cardioprotection in noncardiac surgical patients will be challenging. Meta-analyses of heterogeneous clinical trials using volatile or intravenous anesthetics in patients who are at low or intermediate risk for developing myocardial ischemia due to the nature of the surgical procedure, the burden of disease, or both may not be adequate to elucidate the risks versus benefits of specific anesthetic agents to produce cardioprotection. Per the American College of Cardiology/American Heart Association Task Force on Practice Guidelines Methodology, unpublished data cannot be used to formulate guideline recommendations. Thus, the weight of the evidence suggests that volatile anesthetics are protective against myocardial ischemia/reperfusion injury, and in the absence of data to indicate