

ABSTRACT

OBJECTIVES:

Standard blood flow rates for cardiopulmonary bypass have been assumed to be the same for awake cardiac surgery with thoracic epidural anesthesia as for general anesthesia. However, compared to general anesthesia, awake cardiac surgery with epidural anesthesia may be associated with higher oxygen consumption due to missing effect of general anesthetics. This may result in insufficient oxygen delivery and lactic acidosis when standard blood flow rates were used. The primary aim of our study was to investigate if standard blood flow rates are adequate in awake cardiac surgery. The secondary aim was to evaluate postoperative clinical outcomes of patients undergoing awake cardiac surgery.

METHODS:

Forty-seven patients undergoing elective on-pump cardiac surgery were assigned to receive either epidural (Group TEA, n=17), combined (Group TEA-GA, n=15) or general (Group GA, n=15) anesthesia. To monitor adequacy of standard blood flow rates, arterial lactate, acid base parameters, central venous and jugular bulb saturation were measured at six time points during in all groups. Blood flow rates were adjusted when needed. Subsequently, early and late postoperative outcome data including hospital and 3-year mortality was recorded and compared among the study groups

RESULTS:

No lactic acidosis has developed in any group. TEA as compared to TEA-GA and GA groups had mildly lower central venous and jugular bulb oxygen saturations during cardiopulmonary bypass and during post cardiopulmonary bypass period. TEA group as compared to TEA-GA and GA groups had also mild hypercapnic respiratory acidosis and mild decrease of arterial oxygen saturation at the end of surgery without any clinical consequences. Thus, no additional blood flow rates adjustments in any study group and no ventilatory support in TEA group was required. There was also no major difference in postoperative outcome data across all study groups, except for lower incidence of atrial fibrillation in the TEA group compared to GA group. TEA and TEA-GA group as compared to GA group had lower pain visual analogue scale scores at 24 hours postoperatively and morphine requirements during the first 24 hours after surgery.

CONCLUSIONS:

Under careful monitoring, the use of standard blood flow rates is adequate for patients undergoing awake on-pump normothermic cardiac surgery. Additionally, awake TEA showed no improvement in postoperative outcome, except for lower incidence of atrial fibrillation and superior pain relief.