Underutilized Fuel: Angiotensin II for Vasoplegia in the Heart Failure Patient Population

To the Editor:

WE WOULD LIKE TO congratulate the authors of their post hoc analysis of angiotensin II (ANG-II) for the treatment of vasoplegia in patients after cardiac surgery. The study found that patients with vasoplegia after cardiac surgery with cardiopulmonary bypass rapidly responded to ANG-II, with swift blood pressure response and rapid down-titration of standard-of-care vasopressors with no reported thrombosis. Early recognition and treatment of vasoplegia improves survival and reduces risks of major adverse events. However, in patients with heart failure and severe vasoplegia, treatment with ANG-II is not widely utilized despite the data demonstrating the efficacy of the drug.

In this trial, patients who received ANG-II were more likely to achieve a mean arterial pressure of 75 mmHg or an increase in mean arterial pressure by 10 mmHg above that seen in patients who received placebo in as little as three hours. Furthermore, the median pressor dose decreased from baseline by 76.5% in the ANG-II group compared with an increase of 7.8% in the placebo group (p < 0.05). This makes ANG-II very favorable to the cardiac critical care patient. Given the rapid improvement in the hemodynamic profile upon initiation, one of the advantages of ANG-II may be the beneficial reduction in myocardial oxygen demand following withdrawal of other pressors.

Vasoplegia following graft failure after heart transplantation or in cases of extreme cardiogenic shock commonly are encountered in many cardiac intensive care units. Norepinephrine is often the first-line agent recommended in such cases. The results of this trial raised questions on how to best utilize ANG-II in the cardiovascular intensive care units. Other agents, such as vasopressin and norepinephrine, in addition to mechanical circulatory support and extracorporeal membrane oxygenation, more commonly are utilized. We propose that the cardiac community advocate for and engage in research trials to assess the efficacy of ANG-II in the heart failure patient population who suffer from vasoplegia.

Conflict of Interest

None.

References


In Reference to “Perioperative Milrinone Infusion Improves One-Year Survival After the Norwood-Sano Procedure”

To the Editor:

IN THE ABSTRACT of the article “Perioperative Milrinone Infusion Improves One-Year Survival After the Norwood-Sano Procedure,” Kanazawa et al stated “Perioperative milrinone infusion improved the mortality after the Norwood-Sano procedure.” Furthermore, in the conclusion of the article, they stated, “In conclusion, perioperative milrinone infusion reduced mortality after the Norwood-Sano procedure.” Finally, the title of the article itself stated clearly that the effect of the milrinone infusion was to improve one-year survival.

All three of these statements imply a direct cause–effect relationship between the milrinone infusion and the one-year outcomes. However, the study was a retrospective observational study of just 45 patients. There is no justification, methodologically or statistically, to make a cause–effect statement from any observational study. In fact, the word association should be used for all observational studies when describing a relationship between a putative exposure variable and an outcome. Nothing more can be stated.

As scientists and clinicians, precision of vocabulary and phrasing are very important. This is particularly true for

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titles, abstracts, and concluding paragraphs of scientific articles. This is because it is highly likely that many clinicians will ever read the full text of an article, and, therefore, they may be misled by phrasing in the title or abstract that implies a cause–effect relationship between two variables. We know that abstracts of randomized clinical trials in the anesthesiology literature often are inadequate and subject to “spin” by their authors. Given the additional methodologic challenges inherent to observational studies when compared to randomized clinical trials, it is particularly important to use precise language when they are reported.

Conflict of Interest

None.

References


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Use of the Ventrain Ventilation Device and an Airway Exchange Catheter to Manage Hypoxemia During Thoracic Surgery and One-Lung Ventilation

To the Editor:

HYPOXEMIA is a common challenge during one-lung ventilation (OLV), and first-line approaches for its management include assessing airway device position, increasing oxygen-inspired fraction (Fio2), optimizing ventilation, and applying continuous positive airway pressure to the nonventilated lung. The Ventrain (Ventinova Medical, Eindhoven, Netherlands) allows for ventilation through smaller internal diameter endotracheal tubes or smaller bore catheters. It is a handheld device with tubing for connection to an oxygen flow meter on one end and a male Luer Lock connector on the other end. Ventilation is actuated by alternately covering and uncovering the exhaust hole with the operator’s thumb. On exhalation, the device design exploits the Venturi effect to generate negative pressure during active expiration phase. Ventrain has been used in patients with critical airway narrowing or patients in extremis as a result of failed airway management.

We used the Ventrain device in combination with an 11-Fr airway exchange catheter (VBM Medizintechnik GmbH, Sulz am Neckar, Germany) and DLT (double-lumen tube) to treat refractory hypoxemia in a 52-year-old woman with normal preoperative pulmonary function tests undergoing right video-assisted thoracoscopic pleural biopsies and talc pleurodesis. After anesthetic induction, a left-sided 37-Fr DLT (Shiley Medtronic, Watford, UK) was positioned and checked with the bronchoscope. OLV was initiated using volume control ventilation (tidal volumes = 6 mL/kg predicted body weight), positive end-expiratory pressure (PEEP = 5 cm H2O), and fraction of inspired oxygen of 0.55. After two minutes, oxygen saturation (SpO2) decreased from 98% to 84%, and Fio2 was increased to 90%. SpO2 remained between 88% and 89% after the confirmation of the correct DLT position, an alveolar recruitment maneuver, and PEEP titration to 10 cm H2O. Therefore, an airway exchange catheter cut to 50 cm was inserted through the tracheal lumen adaptor, (leaving the proximal part clamped), to a depth of 45 cm and connected to the Ventrain device. The oxygen flow was set to 6 L/min, and manual ventilation of the right lung was performed at a respiratory rate of about 20/min (Video 1 shows the in vitro model of this technique). SpO2 returned to 98% in one minute. Capnography waveform was displayed on the monitor (Fig 1), and lung movement was thoracoscopically observed (Video 2). The lung movements did not interfere with the surgeon’s work. Two-lung ventilation was restored after 15 minutes. The postoperative course was unremarkable.

In this patient, desaturation occurred quickly and was reversed by manual ventilation using the Ventrain device. This observation suggests that its main cause was probably a high shunt fraction during OLV. Continuous positive airway pressure application and jet ventilation are effective alternatives for managing this kind of hypoxemia. The use of high- and low-frequency jet ventilation also has been shown to improve oxygenation in adults and children. We believe that Ventrain use is easier than jet ventilation systems that use higher work pressures that increase the risk of barotrauma. Jet ventilation also needs specific training, special equipment, and high-pressure wall-piped oxygen. The Ventrain also can be used to manage OLV using a bronchial blocker.

Limitations of our technique remain the lack of monitoring of inspiratory and expiratory flows and airway pressures. Also, airway exchange catheters are quite stiff and potentially can cause bronchial injuries. We decreased this risk by limiting the exit of the tip from the tube by about one centimeter. A small aspiration catheter may be a safer choice, but a connection to the Ventrain must be made without specific connectors.