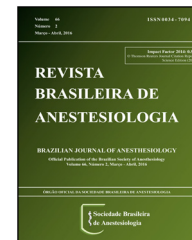




REVISTA BRASILEIRA DE ANESTESIOLOGIA

Publicação Oficial da Sociedade Brasileira de Anestesiologia
www.sba.com.br



SCIENTIFIC ARTICLE

Behavior of stroke volume variation in hemodynamic stable patients during thoracic surgery with one-lung ventilation periods

María Lema Tome*, Francisco Andrés De la Gala, Patricia Piñeiro, Luis Olmedilla, Ignacio Garutti

Hospital General Universitario Gregorio Marañón, Department of Anesthesiology and Reanimation, Madrid, Spain

Received 2 June 2016; accepted 8 November 2017

KEYWORDS

Thoracic surgery;
One-lung ventilation;
Stroke volume
variation;
Goal-directed
therapy;
Heart-lung
interaction

Abstract

Introduction: In last few years, emphasis was placed in goal-directed therapy in order to optimize patient's hemodynamic status and improve their prognosis. Parameters based on the interaction between heart and lungs have been questioned in situations like low tidal volume and open chest surgery. The goal of the study was to analyze the changes that one-lung ventilation can produce over stroke volume variation and to assess the possible impact of airway pressures and lung compliance over stroke volume variation.

Methods: Prospective observational study, 112 patients undergoing lung resection surgery with one-lung ventilation periods were included. Intravenous fluid therapy with crystalloids was set at $2 \text{ mL} \cdot \text{g}^{-1} \cdot \text{min}^{-1}$. Hypotension episodes were treated with vasoconstrictive drugs. Two-lung Ventilation was implemented with a TV of $8 \text{ mL} \cdot \text{g}^{-1}$ and one-lung ventilation was managed with a TV of $6 \text{ mL} \cdot \text{g}^{-1}$. Invasive blood pressure was monitored. We recorded the following cardiorespiratory values: heart rate, mean arterial pressure, cardiac index, stroke volume index, airway peak pressure, airway plateau pressure and static lung compliance at 3 different times during surgery: immediately after lung collapse, 30 min after initiating one-lung ventilation and after restoration of two-lung ventilation.

Results: Stroke volume variation values were influenced by lung collapse (before lung collapse 14.6 (DS) vs. OLV 9.9% (DS), $p < 0.0001$); or after restoring two-lung ventilation (11.01 (DS), $p < 0.0001$). During two-lung Ventilation there was a significant correlation between airway pressures and stroke volume variation, however this correlation lacks during OLV.

* Corresponding author.

E-mail: maria.lematome@gmail.com (M. Lema Tome).

<https://doi.org/10.1016/j.bjane.2017.11.003>

0104-0014/© 2017 Published by Elsevier Editora Ltda. on behalf of Sociedade Brasileira de Anestesiologia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Please cite this article in press as: Lema Tome M, et al. Behavior of stroke volume variation in hemodynamic stable patients during thoracic surgery with one-lung ventilation periods. Rev Bras Anesthesiol. 2018. <https://doi.org/10.1016/j.bjane.2017.11.003>

PALAVRAS-CHAVE

Cirurgia torácica;
Ventilação
monopulmonar;
Variação do volume
sistólico;
Terapia alvo-dirigida;
Interação
coração-pulmão

Conclusion: The decrease of stroke volume variation values during one-lung ventilation with protective ventilatory strategies advises not to use the same threshold values to determine fluid responsiveness.

© 2017 Published by Elsevier Editora Ltda. on behalf of Sociedade Brasileira de Anestesiologia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Comportamento da variação do volume sistólico em pacientes hemodinamicamente estáveis durante cirurgia torácica com períodos de ventilação monopulmonar

Resumo

Introdução: Nos últimos anos, a importância da terapia alvo-dirigida foi enfatizada para otimizar o estado hemodinâmico do paciente e melhorar seu prognóstico. Os parâmetros baseados na interação entre o coração e os pulmões foram questionados em situações como baixo volume corrente e cirurgia aberta do tórax. O objetivo do estudo foi analisar as alterações que a ventilação monopulmonar pode produzir na variação do volume sistólico e avaliar o possível impacto das pressões da via aérea e da complacência pulmonar sobre a variação do volume sistólico.

Métodos: Estudo observacional prospectivo, no qual 112 pacientes submetidos à cirurgia de ressecção pulmonar com períodos de ventilação monopulmonar foram incluídos. A terapia de fluidos intravenosos com cristaloides foi ajustada a $2 \text{ mL.kg}^{-1}.\text{h}^{-1}$. Os episódios de hipotensão foram tratados com vasoconstritores. A ventilação dos dois pulmões foi implementada com volume corrente de 8 mL.kg^{-1} e a ventilação monopulmonar foi controlada com volume corrente de 6 mL.kg^{-1} . Pressão arterial invasiva foi monitorizada. Registramos os seguintes valores cardiorrespiratórios: frequência cardíaca, pressão arterial média, índice cardíaco, índice de volume sistólico, pressão de pico das vias aéreas, pressão de platô das vias aéreas e complacência pulmonar estática em três tempos diferentes durante a cirurgia: imediatamente após o colapso do pulmão, 30 minutos após o início da ventilação monopulmonar e após a restauração da ventilação dos dois pulmões.

Resultados: Os valores de variação do volume sistólico foram influenciados pelo colapso pulmonar (antes do colapso pulmonar $14,6$ [DS] vs. ventilação monopulmonar $9,9\%$ [DS], $p < 0,0001$), ou após o restabelecimento da ventilação dos dois pulmões ($11,01$ [DS], $p < 0,0001$). Durante a ventilação dos dois pulmões houve uma correlação significativa entre as pressões das vias aéreas e a variação do volume sistólico, porém, essa correlação não existe durante a ventilação monopulmonar.

Conclusão: A diminuição dos valores da variação do volume sistólico durante a ventilação monopulmonar com estratégias ventilatórias protetoras sugere não usar os mesmos valores de limiar para determinar a responsividade aos fluidos.

© 2017 Publicado por Elsevier Editora Ltda. em nome de Sociedade Brasileira de Anestesiologia. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

During the last few years, emphasis was placed in goal-directed therapy (GDT) in order to optimize patient's hemodynamic status and thus improve their prognosis. These appear to be based on the dynamic parameters used to predict the volume response: stroke volume variation (SVV), pulse pressure variation (VPP) and pulse delta variation. Some authors have recently shown that these hemodynamic parameters may be useful to guide fluid therapy in thoracic surgery.¹⁻⁶

However, other researches have questioned their usefulness in different situations such as the use of a tidal volume (TV) under 8 mL.kg^{-1} , under open-chest surgery or during

one-lung ventilation (OLV) because of the greater shunt that takes place.⁷⁻⁹ These circumstances coincide in the regularly handling during protective ventilation in thoracic surgery during OLV.

During OLV, even with protective ventilation, the air-flow cut to the prone lung, is associated with a decrease of lung compliance and the increase of airway pressures (Paw). There are different lines of investigation that experimentally have shown that in patients with Acute Respiratory Stress Syndrome (ARDS) the decrease in lung compliance or Paw can disturb SVV values even though a constant blood volume is maintained. However, to our knowledge, this line of research has not been carried out in thoracic surgery. In this type of surgery, the interaction between heart and

Download English Version:

<https://daneshyari.com/en/article/8611603>

Download Persian Version:

<https://daneshyari.com/article/8611603>

[Daneshyari.com](https://daneshyari.com)