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Inferior vena cava distensibility index predicting fluid responsiveness in ventilated patients

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Introduction

Echocardiography is a non-invasive procedure which enables full assesment of cardiac function. The inferior vena cava (IVC) is a compliant blood vessel, easily distended, especially in cases of hypovolemia. Assessment of the physiologic characteristics of the IVC provides a rapid distinction between low and high volume states and offers the clinician a rapid, noninvasive way to guide resuscitation in critically ill patients.

Objectives

To assess the reliability of the distensibility of inferior vena cava (dIVC),measured by ultrasound, as an indicator of fluid responsiveness in ventilated patients

Methods

Observational prospective study in a 14-bed Intensive Care Unit . We enrolled 15 patients requiring advanced hemodynamic monitoring (PiCCO, Vigileo, Swan-Ganz catheter). The dIVC was calculate as (maximum diameter - minimum diameter)/minimum diameter and possible responders were defined as dIVC >18%.IVC assessment was done just proximal to the hepatic veins, which lie approximately 0.5 to 3 cm from the right atrium, following the American Society of Echocardiography guidelines. Hemodynamic parameters were collected at baseline and after a fluid challenge. Fluid challenge was made by de maneuver of passive legs raising (PLR) that mimics a fluid challenge of 300 ml. Fluid responsiveness was defined by an increase of > 15% in cardiac output. Demographics characteristics, reason of ICU admission, severity of illness by APACHE and necessity of vasopressor support were also collected.

Results

We included 15 patients with an age mean of 64.67 + 14.1, 40% male. Abdominal septic shock was the most frequent reason of ICU admission(40%),respiratory (20%),cardiogenic (13.3%) and others(20%).Median APACHE was 19.27 + 5.86. All patients were on mechanical ventilation with PEEP mean 11.40 + 3.74. All patients were on sensual rhythm and 80% needed vasopressor support. Advance hemodynamic monitoring was made by using PiCCO, Vigileo and Swan-Ganz catheter, 60%, 26.7% and 13.3%, respectively. dIVC was > 18% in 4 patients (26.7%) and 2 patients (50%) responded to fluid challenge. In 11 patients (73.11%) dIVC was < 18% and 10 of them (90.9%) didn't respond to fluid challenge. Statistical analysis showed no significant differences ($p > 0.05$).

Conclusions

Assessment of the IVC distensibility index in mechanically ventilated patients provides a useful and reliable tool in predicting response to volume in critically ill patients. Although our data do not show a statistical significance probably due to sample size, measuring the VCI should be part of a hemodynamic assessment specific protocol to evaluate the necessity or not of volume, that it is so important in the evolution of critical patients.

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Reference

1. Barbier C, Loubieres Y, Schmit C, Hayon J, Ricome JL, Jardin F, Vieillard-Baron A: **Respiratory changes in inferior vena cava diameter are helpful in predicting fluid responsiveness in ventilated septic patients.** *Intensive Care Med* 2004, **30(9)**:1740-1746.

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