"UTILITY OF STROKE VOLUME VARIATION AS A PREDICTOR OF FLUID RESPONSIVENESS USING THIRD GENERATION VIGILEO DEVICE IN PATIENTS UNDERGOING BRAIN SURGERY"

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ABSTRACT

Background

Assessment of Stroke volume variation (SVV) using minimally invasive devices in mechanically ventilated patients has been in use for several years to guide fluid administration. This study was designed to assess the utility of SVV derived from arterial pulse contour analysis, using FloTrac/Vigileo system to predict fluid status in patients scheduled for brain surgery.

Method

We studied 60 adult patients undergoing brain surgery. After a 5min period of stable hemodynamic parameters post-intubation, each patient received successive volume loading steps(VLS), of 200ml lactated Ringer's solution (LR), until the increase in SV(stroke volume) was <10%. Blood pressure(BP), Heart rate(HR), SV and SVV were measured before and after each VLS. We measured the optimal preload augmentation required for each patient by the number of VLS after which SV increase was<10%.

Results

There was a statistically significant difference in base line BP and SVV but not in HR between responsive and nonresponsive patients to first VLS. Except for HR, all the measured hemodynamic variables before first VLS showed significant correlation with change in SV after the first VLS. Receiver operating characteristic (ROC) analysis showed a larger area under the curve(AUC) of 0.758 for SVV compared to other measured variables. The median number of VLS administered were 2 per patient equating to a mean ±SD of 368±176 ml of crystalloid as the optimal preoperative infusion volume.

Conclusions

SVV obtained with 3rd generation Vigileo device is a better predictor of preload responsiveness when compared to BP and HR.

KEYWORDS: Stroke Volume Variation, Volume Loading Steps, Neurosurgery, Vigileo Device