

Evaluation of the dynamic predictors of fluid responsiveness in dogs receiving goal-directed fluid therapy.

Drozdzyńska MJ(1), Chang YM(2), Stanzani G(3), Pelligand L(4).
Vet Anaesth Analg. 2017 Jun 17. pii: S1467-2987(17)30216-7. doi:
10.1016/j.vaa.2017.06.001. [Epub ahead of print]

OBJECTIVES: Goal-directed fluid therapy (GDFT) based on pulse pressure variation (PPV) was used in anaesthetized dogs undergoing abdominal surgeries. The aims were 1) to evaluate the success rate of the PPV $\geq 13\%$ in detecting fluid responsiveness [Δ stroke volume (Δ SV) $\geq 10\%$]; 2) to assess the correlation between PPV, systolic pressure variation (SPV), Plethysmograph Variability Index (PVI) and central venous pressure (CVP) and 3) to establish the threshold value for the PVI that would predict a PPV value of $\geq 13\%$ and indirectly discriminate responders from nonresponders to fluid therapy.

STUDY DESIGN: Clinical, prospective, interventional study.

ANIMALS: A total of 63 client-owned dogs scheduled for abdominal procedures.

METHODS: PPV and SPV were calculated manually from the invasive blood pressure trace on the Datex monitor. PVI was recorded from the Masimo pulse oximeter. Fluid challenge (10 mL kg⁻¹ Compound Sodium Lactate) was performed when PPV was $\geq 13\%$ and/or mean arterial pressure (MAP) < 60 mmHg. Fluid responsiveness was assessed by the transoesophageal Doppler probe. Cardiovascular parameters (heart rate, MAP, PPV, SPV, PVI, SV and if available, CVP) were measured before and after each fluid intervention.

RESULTS: PPV $\geq 13\%$ reliably predicted fluid responsiveness in 82.9% of cases. There was positive correlation between PPV and SPV ($r = 0.84$), PPV and logPVI ($r = 0.46$) as well as SPV and logPVI ($r = 0.45$). Noninvasive PVI value $\geq 13\%$ should predict PPV threshold value (13%) with 97% sensitivity and 68% specificity. There was no statistically significant correlation between PPV and CVP.

CONCLUSIONS: PPV is a useful clinical tool to detect occult hypovolaemia and predict cardiovascular response to fluid challenge. Use of PPV is recommended as a part of GDFT in dogs undergoing abdominal procedures.