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ATS 2007 · San Francisco International Conference

Filename: 953384

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ATS member: Yes **Student or in training:** No

Abstract Category: 04.04 - Diagnostic Techniques & Monitoring

Presentation format: Either Poster or Oral

Travel Award: No

Publication of email address: No

I confirm that all authors listed on this abstract have knowledge of the abstract submission: Yes

Title: Inactivation of hypoxic pulmonary vasoconstriction results in acute increase in extravascular lung water measurement by PiCCO in canine acute lung injury

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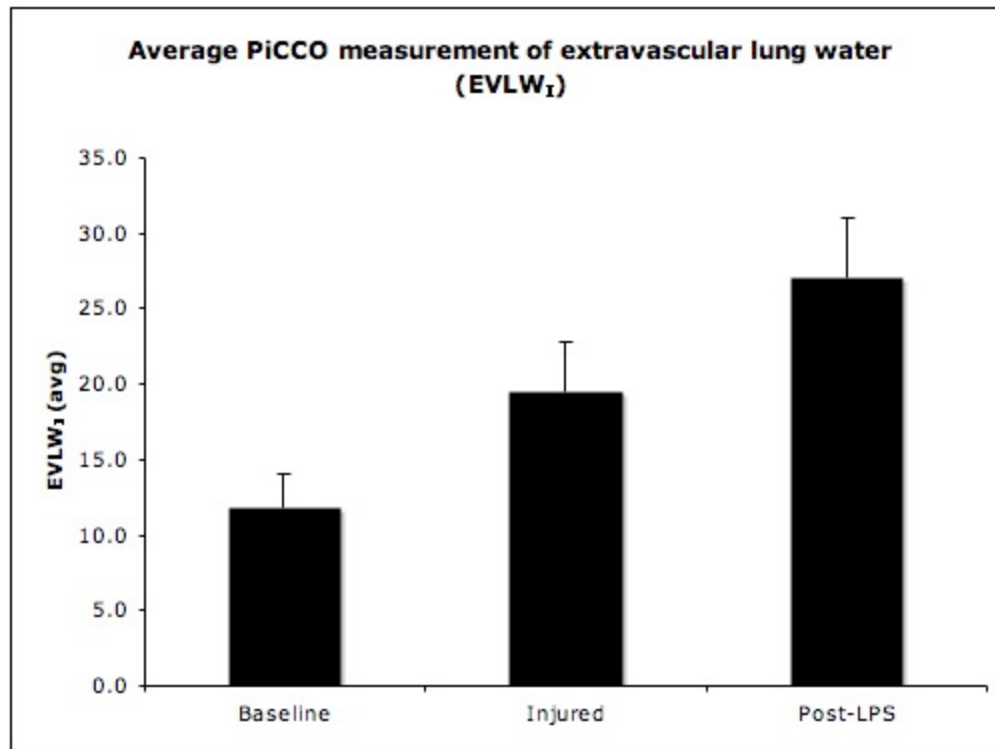
Human and animal studies using the PiCCO transpulmonary thermodilution system (Pulsion, Germany) have demonstrated increased extravascular lung water (EVLW) measurements as P/F ratios lower in sepsis and acute lung injury (ALI), attributed to progression of lung edema and flooding. We hypothesize that redistribution of blood flow resulting from the inactivation of hypoxic pulmonary vasoconstriction (HPV) is another possible cause.

Methods: 5 anesthetized and ventilated canine had PA and PiCCO catheters placed and lung injury induced with i.v. oleic acid (OA). Data including blood gases, hemodynamics, and PiCCO values were recorded every 30 min. Once P/F ratios decreased < 300 and shunt fraction > 20%, 15 mcg/kg i.v. endotoxin (LPS) was administered to inactivate HPV.

Results: OA injury caused an increase in peak and plateau pressures, decrease in cardiac output (CO) and moderate pulmonary hypertension. LPS dosing further decreased CO and dramatically decreased P/F and increased shunt. EVLW increased gradually with OA injury and markedly

following LPS (Fig 1).

Conclusions: The abrupt increase in EVLW and shunt after LPS is consistent with inactivation of HPV and increased perfusion to already flooded lung regions that were previously thermally silent. Future, studies will correlate these PiCCO measurements of EVLW with CT measures of lung tissue density and regional blood flow.



Funded By: NIH HL64368, NIH 1P50HL073994

Off-Label Use Disclosure: No

Financial Disclosure: No

I hereby confirm the Disclosure information above is accurate at the time of this submission. I acknowledge that keying in my name and date of completion below indicates assent to this agreement and is equivalent to my signature.

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