Reviewer's report

Title: Impairment of pulmonary vascular reserve and right ventricular systolic reserve in pulmonary arterial hypertension.

Version: 1 Date: 19 January 2014

Reviewer: Sanjay Mehta

Reviewer's report:

Domingo et al study PAH patients and relate previously documented exercise limitation and cardiovascular limitation to the response to DST - dopamine/Trendelenburg volume loading stress, with assessment of cardiac and vascular reserve responses via echo and PA IVUS. In 18 PAH patients, DST was associated with an impaired hemodynamic response, characterized by a blunted CO, but greater rise in PAP vs 10 controls. PAH group I patients with a greater rise in DST PAP also had evidence of limited pulmonary vascular capacitance reserve (higher deltaEM, dmPAP/dCO, lower deltaSV), and limited RV/cardiac reserve (IVA, deltaTAPSE). Although potential clinical relevance with regards to worse prognosis over 2yrs was hypothesized, this was not observed. This is a novel and physiologically rigorous study, very interesting to clinicians and physiologists, and the paper is well-written with clear data, and largely appropriate conclusions.

Major compulsory revisions:

1. Conclusions: The expectation of worse clinical outcome was not observed, but is consistently stated, in the final sentence of the ABSTRACT, and repeatedly in the DISCUSSION (pg 12, para 1; pg 16, para 2): This is inappropriate and needs to be revised to be at most speculative.

2. Discussion/implications: there is no discussion of the potential causes and outcomes of the differences in PAH groups 1 and 2 (based on DST hemodynamic responses): does this relate to gender, age, etiology of PAH, severity of PAH, Rx type, etc. This would appear to be a major finding of the study, but apart from potential differences in clinical outcomes (which are not demonstrated), other potential implications are not addressed.

Minor essential revisions:

1. ABSTRACT: the 1st 2 sentences of the conclusion seem to be repetitious and need to be revised.

2. Awkward statements to revise: RESULTS (p 9, para 3): “…None dobutamine infusion…”; RESULTS (p 10, para 1): “…nine were changed mPAP <5mmHg …”; RESULTS (p 10, para 1): “…none of hemodynamic and IVUS data showed differences …”; DISC (pg 16, para 2) “…Recognition the presence of …”;

3. Units mPAP/CO don’t seem right: should be mmHg/L/min rather than mmHg/min/L.
4. Figure 2 legend: I think “Fig 2A y B” is Spanish!

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests'