Title: Accuracy of transpulmonary thermodilution cardiac output measurement (PiCCO) in patients with right heart failure (RHF) due to precapillary pulmonary hypertension (PH)

Body: The main cause of death in patients with precapillary PH is RHF. Except right heart cath (RHC), no reliable hemodynamic method has been evaluated to monitor patients with RHF. The aim of our study is to describe the hemodynamic profile of PH patients with RHF requiring vasoactive drugs and to evaluate relevance of PiCCO monitoring. Methods: Data of 15 patients (8 F, 60 y-o) with PH and RHF were prospectively analysed. Baseline clinical, biological and PiCCO data were collected at admission in ICU (d0) and after 5 days. RHC was performed in 7/15 patients within 24 hours after d0. Bland-Altman analyses evaluated the agreement between RHC and PiCCO measurements Results: At d0, median PiCCO values were: mean arterial pressure (MAP) 93 mmHg, central venous pressure (CVP) 16 mmHg, cardiac index (CI) 1.99 L/min/m², cardiac function index (CFI) 2.5 min⁻¹. Median value of central venous O2 saturation (ScvO2) was 55%, BNP 1135 ng/mL, creatinin 123 µM. The bias for PiCCO estimates of CI was 0.08 L/min/m² with 95% limits of agreement (LA) 0.11 to 0.26 L/min/m². The bias for CVP was -0.2 mmHg with 95% LA -4.2 to 3.8 mmHg. At d5, all patients received dobutamine 5 µg/kg/min and 3 additional norepinephrine. Assessment by PiCCO at d5 showed significantly improved CI (2.59L/min/m2; p=0.04), CFI (3.9 min⁻¹; p=0.01) and CVP (11 mmHg; p=0.005). In contrast, MAP measurement, and BNP and creatinin levels did not change significantly Conclusion: PiCCO monitoring in PH patients with RHF seems to be relevant to assess and follow up CI and volemia with a minimal invasive device. This data need to be confirmed in a larger cohort.