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Title: Impact of a patent foramen ovale (PFO) presence in patients with GOLD stage II chronic obstructive pulmonary disease (COPD)

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Body: Background. A higher prevalence of PFO in COPD has been reported suggesting that PFO may contribute to hypoxaemia and impact exercise tolerance. Aims and objectives. Our study aimed to evaluate the presence and the amount of right to left shunt in COPD patients with PFO, and to ascertain the impact on resting arterial oxygen and on exercise tolerance. Methods. 15 GOLD II COPD subjects (8M/7F; Age 69±7SD) underwent lung function tests, blood gas analysis and 6' Walk Test (6MWT). Transcranial Doppler (TCD) with the injection of agitated saline at rest and during Valsalva maneuver was performed to evaluate the presence of PFO. 13 subjects completed cardiopulmonary cycle exercise test with breath-by-breath analysis. During the test oesophageal and gastric pressures were measured, and agitated saline injections performed every 2 minutes while TCD signal was recorded. Results. Seven out of 15 subjects had PFO. PFO+ subjects tended to be slightly more hypoxic than PFO- (PFO+ PaO₂ vs PFO- PaO₂ 77±7 vs 84±6 mmHg, p=0.064) but significant differences between the 2 groups in terms of age, FEV₁ and TLco were observed. No significant differences were observed in terms of 6MWT distance, Oxygen Uptake %pred, and MaxLoad %pred. A slight increase in right to left shunting was observed during exercise in PFO+ subjects (rest injection 5±6 bubbles; 2nd injection 10±14; 3rd injection 10±14; 4th injection 11±10). No bubbles were detected during exercise in PFO- patients. Conclusions. PFO is common in GOLD II COPD. However PFO does not influence oxygen levels at rest or exercise tolerance despite a slightly increased right to left shunt.