Combined oximetry-cutaneous capnography in patients assessed for long-term oxygen therapy

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STUDY AIM: To evaluate the feasibility of combined oximetry (pulse oximetric saturation [Spo(2)]) and cutaneous capnography (transcutaneous carbon dioxide tension [Ptcco(2)]) for oxygen titration in patients requiring long-term oxygen therapy. METHODS: Twenty patients with obstructive or restrictive lung disease underwent oxygen titration using a combined cutaneous oximetry-capnography sensor. The goal of titration was to achieve an oxygen saturation of > 90% without a significant rise in carbon dioxide. Spo(2) and Ptcco(2) measurements at the end of titration were compared with blood gas levels using Bland-Altman analysis and linear regression analysis. RESULTS: The mean (+/- SE of the estimate) Pao(2) while breathing room air was 53.2 +/- 8.1 mm Hg and increased to 75.9 +/- 13.3 mm Hg with oxygen supplementation (p < 0.0001). The mean Paco(2) was 45.9 +/- 8.7 mm Hg at baseline and 47.8 +/- 9.0 mm Hg after oxygen titration (p = 0.003). Bland-Altman analysis for comparison of Ptcco(2) and Paco(2) showed a bias of 0.86 mm Hg with a precision of 3.48 mm Hg. Bland-Altman analysis for the comparison of Spo(2) and arterial oxygen saturation showed a bias of 0.14% with a precision of 1.13%. CONCLUSION: Combined oximetry and cutaneous capnography is feasible during oxygen titration in patients needing long-term oxygen therapy. This noninvasive approach has the potential to reduce the number of arterial blood gas samplings performed.