S59 USING VENOUS BLOOD GAS ANALYSIS IN THE MANAGEMENT OF COPD EXACERBATIONS; A PROSPECTIVE COHORT STUDY

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10.1136/thoraxjnl-2015-207770.65

Introduction COPD exacerbations are a common cause of emergency hospital admission in the UK, with an estimated 94,000 per year. Identifying hypercapnic respiratory failure is crucial. Guidelines recommend obtaining arterial blood samples but these are more difficult to obtain than venous samples. Furthermore, administration of local anaesthetic prior to arterial sampling is seldom used. We assessed whether blood gas values derived from venous samples could replace arterial at initial assessment.

Methods Patients treated for a COPD exacerbation had paired arterial and venous samples taken. Bland Altman analyses were performed to assess agreement between arterial and venous pH, PCO₂ and HCO₃⁻, and between SpO₂ and SaO₂. The number of attempts and pain scores for each sample were measured.

Results 234 patients had paired arterial and venous samples. There was good agreement between arterial and venous measures of pH and HCO₃⁻ (mean difference 0.03 and -0.04, limits of agreement -0.54 to 0.11, and -2.90 to 2.82), and between SaO₂ and SpO₂ (in patients with a SpO₂ of greater than 80%).

We calculated the sensitivity and specificity of a VBG pH and HCO₃⁻ to correctly identify an arterial pH of ≥7.35, and an arterial HCO₃⁻ of ≥21, as well as a SpO₂ to identify a SaO₂ of ≥ 92%. A venous pH of 7.34, a venous HCO₃⁻ of 21.45 and a SpO₂ of 91.5 would have correctly classified 87% (95% CI 82% to 91%), 97% (95% CI 93% to 98%), and 71% (95% CI 65% to 77%), of patients respectively. 96% of patients with an ABG pH of ≥7.35 also had a VBG pH of ≥7.35.

Arterial sampling took more attempts and was more painful than venous (mean pain score 4 (IQR 2–5) and 1 (IQR 0–2), *p* < 0.001).

Abstract S59 Table 1 Agreement between arterial and venous pCO₂, pH and HCO₃⁻

	ABG (Mean) (SD)	VBG (Mean) (SD)	Mean Difference (ABG- VBG) (95% CI)	95% Limits of agreement	N
pH	7.40 (0.09)	7.37 (0.08)	0.03 (0.02 to 0.04)	-0.54 to 0.11	234
HCO ₃ ⁻ (mEq/L)	29.7 (6.3)	29.7 (6.4)	-0.04 (-0.22 to 0.15)	-2.90 to 2.82	232
pCO ₂ (kPa)	6.89 (2.40)	7.63 (2.41)	1.93 (1.58 to 2.28)	-3.38 to 7.24	225

Abstract S59 Table 2 Agreement between SaO₂ and SpO₂

	SaO ₂ (Mean) (SD)	SpO ₂ (Mean) (SD)	Mean Difference (SaO ₂ - SpO ₂) (95% CI)	95% Limits of agreement	N
Oxygen percentage saturation*	91.2 (6.0)	91.0 (4.0)	-0.17 (CI -0.89 to 0.56)	-11.12 to 10.78	224

*in patients with SpO₂ >80%.

Conclusion Arterial sampling is more difficult and painful than venous sampling. There is good agreement between pH and HCO₃⁻ values derived from venous and arterial blood, and between pulse oximetry and arterial blood gas oxygen saturations. This could allow the initial assessment of COPD exacerbations to be based on venous blood gas analysis and pulse oximetry, simplifying the care pathway and improving the patient experience.

S60 EFFICACY AND SAFETY OF ACLIDINIUM/FORMOTEROL FIXED-DOSE COMBINATION IN PATIENTS WITH COPD, STRATIFIED BY ICS USE

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10.1136/thoraxjnl-2015-207770.66

Introduction and objectives This was a secondary analysis, stratified by concomitant inhaled corticosteroid (ICS) use, based on pooled data from ACLIFORM (NCT01462942) and AUGMENT (NCT01437397), two Phase III, 24-week, randomised, double-blind studies of twice-daily aclidinium/formoterol (AB/FF) fixed-dose combination in patients with moderate to severe airflow obstruction.

Methods Patients received twice-daily AB/FF 400/12 µg, AB/FF 400/6 µg, AB 400 µg, FF 12 µg or placebo (PBO). Any baseline ICS use was continued throughout. Assessments: change from baseline in 1-hour morning post-dose and morning pre-dose (trough) forced expiratory volume in 1 s (FEV₁) at Week 24 and Transition Dyspnoea Index (TDI) score (pre-planned), rate of exacerbations and adverse events (AEs).

Results Analyses included 3398 patients (mean age 63.5 years; 60.5% male; baseline ICS use range 38.7–40.0%). In patients using ICS, AB/FF 400/12 µg improved post-dose FEV₁, trough FEV₁ (Table 1), and TDI vs PBO by 297 mL, 145 mL and 1.59 units, respectively (all *p* < 0.001). In addition, in patients receiving concomitant ICS, AB/FF 400/12 µg improved post-dose FEV₁ and trough FEV₁ (Table 1) by 109 mL and 71 mL, respectively, vs FF alone (both *p* < 0.001) and by 151 mL and 54 mL, respectively, vs AB alone (*p* < 0.001 and *p* < 0.05, respectively). In patients not using ICS, there were improvements with AB/FF 400/12 µg in post-dose FEV₁, trough FEV₁ (Table 1) and TDI of 290 mL, 135 mL and 1.36 units vs PBO, respectively (all *p* < 0.001). The exacerbation rate was higher in patients using ICS