

European Respiratory Society Annual Congress 2013

Abstract Number: 691

Publication Number: P3987

Abstract Group: 4.1. Clinical respiratory physiology, exercise and functional imaging

Keyword 1: Acute respiratory failure **Keyword 2:** Physiological diagnostic services **Keyword 3:** Monitoring

Title: Diagnostic accuracy of venous blood gases compared to arterial blood gases

Dr. Onofre 6804 Moran morano@queensu.ca MD ¹, Mr. Lukas 6805 Brown lbrown@qmed.ca ¹, Dr. Heather 6806 Murray heather.murray@queensu.ca MD ² and Dr. Louise 6807 Rang rangl@kgh.kari.net MD ². ¹ Medicine, Queen's University and Kingston General Hospital, Kingston, ON, Canada, K7L2V6 and ² Emergency Department, Queen's University and Kingston General Hospital, Kingston, ON, Canada .

Body: Background: Arterial blood gases (ABGs) are the gold standard to assess acid-base balance, ventilation and blood oxygenation. However, using venous blood gases (VBGs) could avoid the pain and complications associated to ABGs. No studies have assessed if VBGs are comparable to ABGs in reaching the same diagnosis of normal vs. abnormal pH, CO₂, and HCO₃⁻. Objectives: To assess the diagnostic accuracy of VBGs compared to ABGs. Methods: All patients presenting to the emergency department of Kingston General Hospital who required ABGs were eligible for the study. Emergency physicians or residents obtained ABG samples from radial, brachial, or femoral arteries on 218 patients. Nurses immediately drew VBG samples from peripheral veins. Blood gas analyses were performed on the Radiometer ABL 500 and 520 gas analyzers. We calculated the sensitivity and specificity of VBGs, using ABGs as the gold standard. Published normal venous (only one complete set of normal VBGs found) and arterial values were used to determine normal vs abnormal results for pH, CO₂, and HCO₃⁻. Results: As shown in table 1, VBGs had low sensitivity and/or specificity for detecting most blood gas abnormalities; this could lead to common misdiagnoses and mismanagement of patients.

Accuracy of VBGs compared to ABGs

	Sensitivity (%)	Specificity (%)	False Abnormal (%)	False Normal (%)
pH	77	80	20	23
PCO ₂	75	64	36	25
HCO ₃	95	69	31	5

Conclusion: Given the high proportion of false normal and abnormal results using currently available venous blood normal values, VBGs cannot replace ABGs to diagnose acid-base or ventilatory derangements.