Observational evaluation of current use of emergency department blood gases for critically injured patients at a Level 1 trauma centre

BENERU D 1, COGGINS A 2, HSU J 1

1 TRAUMA Department, Westmead Hospital, Sydney, Australia
2 EMERGENCY Department, Westmead Hospital, Sydney, Australia

Background
Arterial blood gas sampling is an established investigation for risk stratification of critically injured patients in the Emergency Department (ED).

Established guidelines recommend the routine use of an Arterial Blood Gas (ABG) in trauma patients. However, ABG sampling is often painful and can be complicated by arterial injury. As a result, in other clinical contexts, such as sepsis, the venous blood gas (VBG) has been cited as a potential alternative ED screening tool for various types of shock.

Methods
We set out to examine the prevalence of blood gas sampling in ED patient with significant trauma.

Retrospective evaluation of a convenience sample of trauma database patients.

Uninterrupted sample of consecutive cases admitted to the trauma unit April 2017 January 2018. Patients meeting the pre-defined inclusion criteria (Injury Severity score (ISS) ≥ 12). were identified by our trained database manager and individual medical records were evaluated for type blood gas sampling within 4-hours of presentation to the ED.

Results
Over 9-months 2,752 trauma cases were admitted to the trauma unit (Fig. 1). Of these 455 had ISS ≥12. Overall in-patient mortality was 8.6%. Mean age of non-survivors was 70.84 years (SD 20.4) and survivors was 51.45 years (SD 22.1) (p<0.001). 74.1% were male and median ISS was 17.

VBG sampling occurred in 243 (53.4%); ABG sampling in 63 (13.8%); no blood gas was taken in 83 (18.2%) and both samples were taken in 66 (14.5%). (Fig. 2)

Discussion
Despite trauma guidelines recommending universal ABG sampling, the majority of patients with ISS>12 in this trauma centre underwent VBG sampling. This may suggest that VBG use has already been adopted by some providers as an acceptable surrogate test of perfusion in trauma. Further studies are required to determine what VBG cut-points should be used and if the VBG is a reliable predictor of shock in trauma.

Contact Details
Demi.beneru@health.nsw.gov.au