

## **Hyperkalemia measurement between blood gas analyser and main laboratory biochemistry analyser**

### **ABSTRACT**

**Introduction:** Potassium level is measured for patients with high risk of hyperkalemia in the emergency department (ED) using both blood gas analyser (BGA) and biochemistry analyser (BCA). The study was conducted to evaluate the correlation and agreement of potassium measurement between BGA and BCA.

**Materials and Methods:** This is a prospective cross-sectional study on the data obtained from Hospital Universiti Sains Malaysia (Hospital USM) from Jun 2018 until May 2019. Blood samples were taken via a single prick from venous blood and sent separately using 1ml heparinised syringe and were analysed immediately in ED using BGA (Radiometer, ABL800 FLEX, Denmark) and another sample was sent to the central laboratory of Hospital USM and analysed by BCA (Architect, C8000, USA). Only patients who had potassium levels  $\geq 5.0$ mmol/L on blood gas results were included. A total of 173 sample pairs were included. The correlation and agreement were evaluated using Passing and Bablok regression, Linear Regression and Bland-Altman test.

**Result:** Of the 173 sample pairs, the median of potassium level based on BGA and BCA were 5.50mmol/L (IQR: 1.00) and 5.90mmol/L (IQR: 0.95) respectively. There was significant correlation between two measurements ( $p < 0.001$ ,  $r = 0.36$ ). The agreement between the two measurements showed within acceptable mean difference which was 0.27 mmol/L with 95% limit of agreement were 1.21mmol/L to 1.73mmol/L.

**Conclusion:** The result of blood gas can be used as a guide for initial treatment of hyperkalaemia in critical cases where time is of the essence. However, BCA result is still the definitive value.