The aim of this study was to determine whether IO values agree sufficiently with arterial values to be used for clinical decision making” Jousi et al (2017).

Abstract:

BACKGROUND: Point-of-care (POC) testing is highly useful when treating critically ill patients. In case of difficult vascular access, the intraosseous (IO) route is commonly used, and blood is aspirated to confirm the correct position of the IO-needle. Thus, IO blood samples could be easily accessed for POC analyses in emergency situations. The aim of this study was to determine whether IO values agree sufficiently with arterial values to be used for clinical decision making.

METHODS: Two samples of IO blood were drawn from 31 healthy volunteers and compared with arterial samples. The samples were analysed for sodium, potassium, ionized calcium, glucose, haemoglobin, haematocrit, pH, blood gases, base excess, bicarbonate, and lactate using the i-STAT® POC device. Agreement and reliability were estimated by using the Bland-Altman method and intraclass correlation coefficient calculations.

RESULTS: Good agreement was evident between the IO and arterial samples for pH, glucose, and lactate. Potassium levels were clearly higher in the IO samples than those from arterial blood. Base excess and bicarbonate were slightly higher, and sodium and ionised calcium values were slightly lower, in the IO samples compared with the arterial values. The blood gases in the IO samples were between arterial and venous values. Haemoglobin and haematocrit showed remarkable variation in agreement.

DISCUSSION: POC diagnostics of IO blood can be a useful tool to guide treatment in critical emergency care. Seeking out the reversible causes of cardiac arrest or assessing the severity of shock are examples of situations in which obtaining vascular access and blood samples can be difficult, though information about the electrolytes, acid-base balance, and lactate could guide clinical decision making. The analysis of IO samples should though be limited to situations in which no other option is available, and the results should be
interpreted with caution, because there is not yet enough scientific evidence regarding the agreement of IO and arterial results among unstable patients.

CONCLUSIONS: IO blood samples are suitable for analysis with the i-STAT® point-of-care device in emergency care. The aspirate used to confirm the correct placement of the IO needle can also be used for analysis. The results must be interpreted within a clinical context while taking the magnitude and direction of bias into account.

Reference:

Jousi, M., Saikko, S. and Nurmi, J. (2017) Intraosseous blood samples for point-of-care analysis: agreement between intraosseous and arterial analyses. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine. 25(1), p.92.

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