Validation of a Point-of-Care Testing ionized magnesium analyser
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Introduction:
Awareness of the range of biological functions of magnesium (Mg) is growing. The benefits of Mg testing on critically ill patients have been recognized (1, 2). Most laboratories measure only total serum Mg concentrations while the ionized form (iMg) is believed to be the physiologically active component (2, 3). By using an ion-selective electrode iMg can be measured. In this study we validate the precision of the Stat Profile® pHOx® Plus M analyser (Nova Biomedical) for iMg measurement, test different vacutainers, and stability at different temperatures.

Methods:
Blood samples were taken from 3 healthy volunteers after written informed consent. Blood was collected in different vacutainers (lithium heparin (Li-hep) 17 IU/mL, serum glass, serum with clot activator) and stored at room temperature, 4°C and -20°C. Precision was tested by 15 successive measurements. Stability was tested at different temperatures at different time points (0, 2, 4, 6, 24 and 48 hours; 1, 2, 4 and 8 weeks). Statistical analysis was performed using SPSS software (vs22).

Results:
Precision testing showed a mean SD of 0.011 mmol/L and a mean CV of 1.82%. There was no significant difference in measured values between the recommended Li-hep vacutainer and the serum vacutainer with clot activator and serum glass vacutainer.
Whole blood kept for more than 2 hours at room temperature (or more than 4 hours at 4°C) shows significant different iMg levels compared to baseline. Stored at -20°C, serum iMg concentrations were unstable.

Conclusion:
The pHOx® analyser measures iMg with high precision. Whole blood samples can be stored up to 2 hours at room temperature and up to 4 hours at 4°C prior to analysis. Serum cannot be stored at -20°C.

References:
1. Sen et al. Neurotherapeutics 2010; 7: 91

Notes: pHOx® analyser was provided by Nova Biomedical, Waltham MA, USA.