

Background

Hyperammonaemia is a clinical emergency, therefore prompt and accurate measurement of ammonia by the laboratory is critical. Samples for ammonia analysis should be collected into EDTA and sent to the lab on ice without delay in order to avoid falsely elevated results. Guidance from MetBioNet regarding hyperammonaemia¹ includes recommendations for laboratories relating to processing of compromised samples. A quality improvement (QI) project was initiated at Barts Health in June 2019 to audit processing of compromised samples for ammonia analysis against this guideline, and to implement measures to improve the laboratory's ammonia service.

Aims (based on MetBioNet guidelines¹)

- 100% of EDTA samples received for ammonia analysis to be accepted for analysis
- 100% of compromised samples (not received on ice and/or transport delay of \geq approx. 15 mins) with elevated ammonia results to be reported with appropriate interpretative comments

Baseline data (collected between 03/06/2019 and 17/06/2019)

- 95% (40/42) of EDTA samples received for ammonia analysis were accepted for analysis. Two samples not received on ice were rejected.
- Two known compromised samples (one received not on ice and one received after a delay) with elevated ammonia results were released without appropriate interpretative comments.

The baseline data highlighted that whether or not the sample was received on ice was not always recorded at sample reception, and therefore it was not possible to reliably know how many compromised samples had appropriate comments.

Changes implemented

- Reception staff instructed to indicate at booking whether samples for ammonia were received on ice or not
- Reception and BMS staff were instructed to accept all EDTA samples for analysis regardless of pre-analytical conditions.
- An algorithm for interpretation of hyperammonaemia in compromised samples (with comments) was designed for authorizing BMS staff

Results

Process measure = % of samples with details of whether or not sample was received on ice recorded (see Figure 1.)

Figure 1 shows the increase in the percentage of samples booked indicating whether or not they were received on ice between the pre-implementation and post-implementation period, and the actions taken to improve recording during this period. By the end of the monitoring period, the percentage with on ice/not on ice recorded had increased to 82% (from 36% in the baseline period).

Outcome measure 1 = % of EDTA samples accepted for analysis

Ninety-nine percent (98/99) of EDTA samples were analysed in the post-implementation period compared with 95% in the baseline period. In all cases rejection was due to the sample arriving not on ice and no samples were rejected in either period due to delay in receipt.

Outcome measure 2 = % of compromised samples with elevated ammonia reported with appropriate comments

Post-implementation, 67% (2/3) of compromised samples with elevated ammonia were reported with appropriate comments, compared with 0% (0/2) in the baseline data period.

