The Royal College of Pathologists
Pathology: the science behind the cure

Patient Safety Bulletin

Danger in delay

What happened and what were the issues/implications?

An incident was reported to the National Reporting and Learning System (NRLS, the national database of patient safety incidents reported by all NHS organisations in England and Wales and held by the national patient safety team). It described a significant delay in identifying, and therefore treating, a patient with hyperammonaemia, which may have contributed to the permanent harm of a baby. The bloods were not taken following deterioration, which was an issue in itself, but once the blood sample had been taken, a number of laboratory issues contributed to the delays and caused avoidable harm. These included:

- a delay in testing the sample. It had to be sent from one hospital to another, as the chemistry analyser at Site 1 had been out of service for several days. However, the chemistry analyser at Site 2 was also out of service for maintenance for several hours on the day of the incident.
- further delays were caused by one of the labs stating that the sample should not have been sent to them and would now be haemolysed, requiring a new sample. In all, the incident involved three unused samples. Two of these were discarded owing to the sample being haemolysed and another was not recognised as urgent as it was not placed on ice for transfer to the lab.
- further delays were due to a miscommunication to the clinical team, resulting in the assumption that the ammonia levels were lower than they actually were, therefore a repeat test was not requested immediately. When the repeat level was carried out, the child had an extremely high ammonia level.

What actions were taken?

Three actions were taken by the organisation. First, as stated in MetBioNet's best practice guidelines on hyperammonaemia,[1] haemolysed samples should be analysed and reported with an interpretative comment advising caution, given the sample quality and need for repeats (even when results suggest that treatment should start). All samples will now be treated as per the guidelines.

Second, in addition to the lab communicating all results >100 µmol/L to the clinical team as per RCPath guidance, the lab will communicate all results >150 µmol/L directly to the metabolic consultant.

Third, the case study and actions were presented to the regional critical care forum and the changes have been made across the region.

The national patient safety team communicated this incident and the NRLS results with the College.

As the incident was shared with the national patient safety team, the NRLS was examined to see if there were any further similar incidents. It found 88 relevant incidents over a two-year period, which can be categorised as lab errors, sample delivery errors or result delays.

Lab errors (n=38) were generally due to the samples getting to the lab in a timely manner but then being forgotten, left in the centrifuge or misplaced in a non-urgent area, or mistakes being made in the process. Examples of this included:

- sample discarded – 16
- late sample used – 2
- unknown if sample used – 2
- sample 'used in error' – 2

Incorrect sample delivery (n=23) led to further incidents. Examples included:

- ice melted/ice not used/no ice on unit (samples discarded) – 4
- no ice on unit (unknown if sample used) – 1
- sample sent through pod system (sample discarded) – 1
- sample sent through pod (unknown if used) – 2
- sample sent through pod (sample used) – 1

Delays in results (n=12), not connected to a lab error or lab delay, included:

- late arrival of sample to the lab (sample discarded) – 3
- late arrival of sample to the lab (sample used) – 2
- late arrival of sample to the lab (described as 'used in error') – 1

What did you learn?

- The results above are consistent with the findings of the national ammonia audit, conducted by MetBioNet in May 2019. It is notable that the best practice guidelines on reporting haemolysed samples are not always followed. Other delays occur in the system at some point in the pathway, from samples being requested to the results being reported on for clinical treatment decisions.
- Ammonia analysis is a time-critical test.[2] It is important to ensure the coordination of the maintenance of analysers, so that they are available at all times to meet the constant requirement of ammonia analysis in labs.

How was the learning shared?

It was agreed that the findings and actions of the local organisation and patient safety team would be shared with the College, for discussion in the relevant networks such as the Chemical Pathology SAC, and with the MetBioNet group, to ensure they are aware of this incident to support their guidelines.

References

1. National Metabolic Biochemistry Network. *Guidelines for the Investigation of Hyperammonaemia*. Available at: https://metbio.net/best-practice-guidelines/#7-guidelines-for-the-investigation-of-hyperammonaemia-
2. NHS England. *Template Structure for Essential Services Laboratory – Blood Sciences Provision*. Available at: www.england.nhs.uk/wp-content/uploads/2020/08/Template_structure_for_ESL_blood_sciences_RE03.pdf

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