Scotland Audit Group Bulletin

CSF xanthochromia

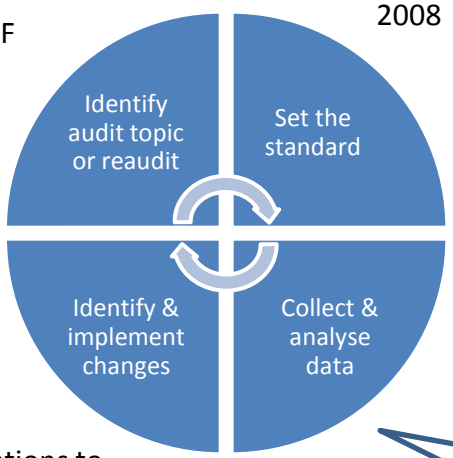
Audit lead: Dr J McNeilly

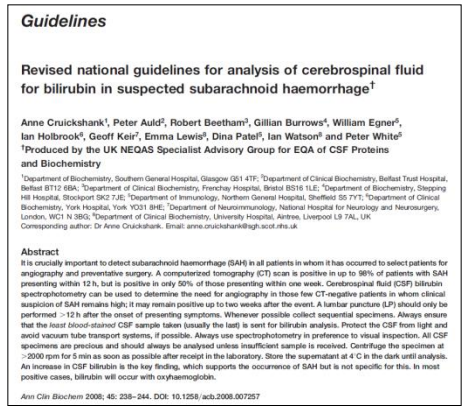
Which area did you audit and why?

- Cerebrospinal fluid (CSF) bilirubin spectrophotometry is a key test to determine the need for angiography in CT-negative patients with suspicion of subarachnoid haemorrhage (SAH)
- The aim was to compare current laboratory practices regarding CSF analysis throughout Scotland
- We audited this in May 2018

What were the audit standards?

- "Revised National Guidelines for Analysis of Cerebrospinal Fluid for Bilirubin in Suspected Subarachnoid Haemorrhage", 2008





Guidelines

Revised national guidelines for analysis of cerebrospinal fluid for bilirubin in suspected subarachnoid haemorrhage†

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Abstract

It is crucially important to detect subarachnoid haemorrhage (SAH) in all patients in whom it has occurred to select patients for angiography and preventative surgery. A computerized tomography (CT) scan is positive in up to 98% of patients with SAH presenting within 12 h, but is positive in only 50% of those presenting within one week. Cerebrospinal fluid (CSF) bilirubin spectrophotometry can be used to determine the need for angiography in those few CT-negative patients in whom clinical suspicion of SAH remains high; it may remain positive up to two weeks after the event. A lumbar puncture (LP) should only be performed >12 h after the onset of presenting symptoms. Whenever possible collect sequential specimens. Always ensure that the *least blood-stained* CSF sample taken (usually the last) is sent for bilirubin analysis. Protect the CSF from light and avoid vacuum tube transport systems, if possible. Always use spectrophotometry in preference to visual inspection. All CSF specimens are precious and should always be analysed unless insufficient sample is received. Centrifuge the specimen at >2000 rpm for 5 min as soon as possible after receipt in the laboratory. Store the supernatant at 4 °C in the dark until analysis. An increase in CSF bilirubin is the key finding, which supports the occurrence of SAH but is not specific for this. In most positive cases, bilirubin will occur with oxyhaemoglobin.

Ann Clin Biochem 2008; 45: 238–244. DOI: 10.1258/acb.2008.007257

What are the next steps for laboratories?

- Review the guideline recommendations to
  1. Protect samples from light
  2. Send simultaneous samples for total protein and bilirubin
  3. Not send via pneumatic tube systems
- Laboratories should run an appropriate IQC material at a frequency commensurate with the service provided

What key things did you learn?

- All laboratories in Scotland offering a CSF xanthochromia service are aware of the National Guidelines
- Not all laboratories recommend: 1) protecting samples from light, 2) sending simultaneous samples for total protein and bilirubin and 3) samples should not be sent by pneumatic tube system
- Volume requirements vary widely (180 µL to 1.5 mL of CSF) despite most laboratories using the same system
- A variety of staff (BMSs, Clinical Scientists, medics) clinically authorise results
- BMSs appear to mainly report results out of hours
- Most laboratories report results within 24 hours of receipt but turnaround times vary widely
- Most, but not all (7 out of 8), laboratories run internal quality control samples however frequency varies widely (from 12 hrs to 1 week)
- All laboratories take part in external quality assessment

For more details: http://www.acb.org.uk/whatwedo/science/audit/audits-by-group/scotland-audit-group