



The Weekly Probe

24th January 2020

Volume 17 Issue 3

Delayed Intracranial haemorrhage with NOACS and warfarin
Blood cultures
Quote / Joke / Cartoon of the Week

Delayed Intracranial haemorrhage with NOACS and warfarin

Nowadays it seems as though 50% of the elderly population are on NOACs (novel oral anticoagulants) such as rivaroxaban and apixaban.

When these patients present post fall with any potential head injury, our regular practice is to perform a cerebral CT and if this is normal, patient are often discharged home.

However what is the risk of delayed intracranial haemorrhage (ICH) in these patients?

One article that caught my eye recently was a study by Cocca et al.

They comment that the reported risk of delayed intracranial hemorrhage (ICH) in a trauma patient on warfarin is estimated to be between 0.6% and 6%.

However in their study they looked at geriatric patients (age older than 64 years) who were initially evaluated at their US level I trauma center, who had fall from standing height or less, and were anticoagulated (warfarin or NOACs) over a 12 month period.

Results :

- Seventy-seven patients met inclusion criteria (33 warfarin / 44 NOACs). The mean age was 80 ± 7.7 years.
- The admission head computed tomography scan was positive in 20.8% of patients.
- Positive scans were more common in patients on warfarin vs. NOACs (30% vs. 14%; $p = 0.074$)
- Not surprisingly, positive initial scans were more common in those with higher Injury Severity Score 9 vs. 5 and higher Abbreviated Injury Scale–Head scores
- The agreement between loss of consciousness (LOC) and ICH was 72% ($\kappa = -0.064$; $p = 0.263$). Note that the absence of LOC does not eliminate the possibility of ICH

Most importantly

- Fifty-one % of patients had a repeat head CT.
- The median time to repeat head CT scan was 8 h (interquartile range 6–12 h)
- **New ICH was diagnosed in 9.6% of patients.** All of these patients were on NOACs.
- Of those NOAC patients with initially normal scans , they found 14% had bleeding on repeat imaging

- Injuries seen were : subdural n = 1, intraventricular n = 2, and intraparenchymal n = 2. One of these delayed ICH patients resulted in death.
- Note that none of the patients with initially normal imaging were given reversal agents.

In contrast, another US study by Mann et al over a 2 year period (2014-15) 1076 elderly trauma patients presenting to a trauma centre were downloaded, of which 838 sustained a minor fall and 513 were found to be using a pre-injury anticoagulant or antiplatelet (ACAP) therapy.

- Of the 513 – 473 had documented initial head CT results, of which 293 were initially negative
- Of the 293, 218 had documented repeat Ct heads
- Of these 218 patients, they were taking, a real mixed-bag of meds
- Warfarin 33% / dabigatran 2.7% / apixaban 5% / rivaroxaban 6% / dipyridamole 1.8% / enoxaparin 0.9% / aspirin 54% / clopidogrel 16.5%. (note that 19 % had multiple meds)

In their study, **1 patient (0.46%)** with a delayed intracranial haemorrhage out of 218 patients who received a routine repeat head CT.

Another Austrian study retrospectively analysed data on 793 patients with head trauma and antithrombotic therapy without pathologies on their initial CT- aspirin 46.4%, clopidogrel 10.8% and “vitamin K antagonists” 32.2%, NOACs (dabigatran and rivaroxaban) 4%
They observed 11 delayed haemorrhages (1.2%) (6 warfarin, 2 aspirin & clopidogrel, 2 aspirin, 1 dabigatran) – 1 required surgery

Take Home Points :

- Be aware of the risks of delayed haemorrhage particularly the NOACs.
- Educate patients and relatives of the risk and the need to repeat imaging particularly if there is any change in the clinical condition.
- If any concerns observe the patient and repeat imaging in 6-12 hours

Ref : Cocca A et al, Delayed Intracranial Hemorrhage in Anticoagulated Geriatric Patients After Ground Level Falls Dec 2019 J. Emerg med 57(6), 812–816 <https://doi.org/10.1016/j.jemermed.2019.09.011>

Mann N et al., *BMC Emergency Medicine* volume 18, Article number: 27 (2018)

Antoni A, Delayed Intracranial Hemorrhage in Patients with Head Trauma and Antithrombotic Therapy J Clin Med Oct 19

BLOOD CULTURE BOTTLES

The blood culture bottles are the only way we can diagnose bacteraemia.

There is one school of thought is that we over use this test and our treatment should be guided by the micro results of samples taken from the source such as urine, sputum and pus.

The Choosing Wisely campaign advocate to **“Avoid blood cultures in patients who are not systemically septic, have a clear source of infection and in whom a direct specimen for culture (e.g. urine, wound swab, sputum, cerebrospinal fluid, or joint aspirate) is possible”**.

This is particularly relevant considering the costs of the test (\$30) particularly in the low risk populations and the reasonably high contamination rate (~up to 5-10%- higher in paediatrics), which has associated downstream “costs”.

However when this source cannot be located or sampled, and there is a reasonable suspicion of bacteraemia, blood cultures should be taken. Subsequently the suggested indications for a blood culture include:

1. Clinical features of sepsis including tachycardia, tachypnoea, increased or decreased temperature and change in sensorium, hypotension or prostration
2. Suspicion of infective endocarditis
3. Pyrexia of unknown origin
4. Unexplained leucocytosis or leucopenia
5. Systemic and localised infections including suspected meningitis, osteomyelitis, septic arthritis, acute untreated bacterial pneumonia or other possible bacterial infection

How much blood and into which bottle?

The **Take Home Message** comes first –

- 1) the more blood sampled , the more likely the bacteraemia is detected.
- 2) aerobic tubes are more useful yet there is utility with also collecting the anaerobic bottle

Volumes – The more blood that goes in the larger the inoculums, the higher the sensitivity and the shorter time to positivity. Maintaining the correct ratio of blood to culture medium is important- ratio of blood:broth of 1:5 has been recommended ie 8-10ml of blood . Subsequently the NSW Clinical Excellence Commission (CEC) have recommended that if less than 10ml is collected **all** of this should be inoculated into the aerobic bottle.

If more than 10ml is available this should be inoculated into the anaerobic bottle.

Aerobic vrs anaerobic bottles – what about only inoculating the aerobic bottle?

- One French study of 19677 cultures in 50 040 patients demonstrated the utility of using both bottles
- 10% +ve cultures – Of those +ve cultures:
 - o 30.6% +ve in aerobic bottle only
 - o 50.3% +ve in both aerobic and anaerobic bottles
 - o 19% +ve in anaerobic bottle only

Organisms grown only in the anaerobic bottle included anaerobic bacteria (eg Bacteroides , Clostridium , Peptostreptococcus, Lactobacillus , Fusobacterium, Actinomyces) , enterobacteriae, Strep / enterococcus , Staph spp
ie the use is not restricted to purely anaerobic bacteria

Having an anaerobic bottle also helps with:

- Reducing the time to when growth is detected in the bottles.
- Improved ability to discern whether the sample is contaminated

Number of bottles - So, the sensitivity of a single set of blood cultures (2 bottles) is around 60%. This increases to around 90% with 2 sets and 95% with three. This is largely related to the volume of blood taken as opposed to the number of sets of bottles. Basically more blood taken = more chance of having the bug in it. 3 would be preferred if IE is suspected (especially SBE).

Refs:

- [CEC website](#)
- Grohs P et al Relevance of routine use of the anaerobic blood culture bottle *J Clin Microbiol* Aug 2007; 45(8) 2711-15
- Hall KK Updated review of blood culture contamination *Clin Microbiology Reviews* Oct 2006; 19(4) 788-802
- Dr R. Stevens – POWH Microbiology dept.

CARTOON / JOKE / QUOTE OF THE WEEK



"It's for my back. You have two more questions."

Please forward any funny and litigious quotes you may hear on the floor (happy to publish names if you want)

The Week Ahead