



Article Appraisal

Article: CT within 6 hours of headache onset to rule out subarachnoid hemorrhage in nonacademic hospitals. Blok K et al. *Neurology*. 2015;84:1927–1932

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Background and Study Objective(s):

Subarachnoid haemorrhage is currently diagnosed using a CT scan if < 6 hrs after symptom onset with a subsequent LP after 12 hours for confirmation for negative CT heads. This study aims to supplement the work of Dr. Perry's group (Sensitivity of computed tomography performed within 6 hours of onset of headache for diagnosis of subarachnoid haemorrhage: prospective cohort study) *BMJ* 2011. The objective of this study is to determine if a head CT read as negative by a non-academic hospital radiologist within 6 hours of symptom onset could rule out subarachnoid haemorrhage. This would negate the need for a follow-up LP after 12 hours.

Study Design:

This was a retrospective case series from 11 non-academic hospitals in the Netherlands. 760 patients were selected from 2007-2013. The inclusion criteria were a normal LOC without focal deficits, a head CT read as negative by a staff radiologist and a subsequent CSF spectrophotometry. CT's read as normal with subsequent positive CSF analysis were independently reviewed by 2 neuroradiologists and a stroke neurologist. Patients with a positive CSF subsequently went on to have gold standard confirmation imaging with one of CTA, MRA or DSA. A subset of patients were followed clinically and did not receive additional imaging.

Results:

Of the 760 patients with original CT heads read as negative for SAH, 52 had positive CSF results. Of these only 1 had a positive CT head on review (end diagnosis was a peri-mesencephalic bleed). Of the remaining 51 patients, 28 had gold standard imaging. 20 had no aneurysm while 8 had aneurysms but were felt to be clinically unlikely to rupture. The 23 patients who had no advanced imaging and were followed on clinical grounds had a mean follow up of 53 months for re-presentation for SAH. None of these patients presented to hospitals within the study catchment with a SAH. The authors of the study conclude that the NPV for non-academic radiologist to rule out SAH in patients presenting <6 hours after symptom onset was 99.9%

Validity of Results:

This was a retrospective case series which has inherently more bias than higher levels of evidence. In addition, SAH is a rare diagnosis so any test would appear to have an excellent NPV. However, the study design was well constructed and patients followed-up appropriately.

Generalizability of Results:

This study has very good generalizability to ED practitioners as headache is a common complaint and SAH is one of the most feared pathologies to miss. The study inclusion criteria were fairly broad and therefore apply to many of the patients seen in Canadian EDs. In addition, the radiology residency training is 5 years long which is comparable to that done in Canada.

The Bottom Line:

This study has limitations – mainly its being a retrospective case series. Taken alone this study would not have the power to change practice. However, its results are in keeping with several large trials published in the last 8-9 years suggesting that a negative CT head < 6 hours after symptom onset is adequate to rule out a SAH. The individual physician will have to take this data into account and formulate a discussion with the patient regarding risks of not doing further testing (rare possibility of missing a SAH) vs the complications of LP.