Current tools have low accuracy for predicting delayed ischemia after aneurysmal subarachnoid hemorrhage

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Both CT angiography and transcranial Doppler have limited accuracy in detecting cerebral vasospasm and predicting delayed cerebral ischemia (DCI) in patients with subarachnoid hemorrhage (SAH) due to ruptured aneurysm, reports a study in the inaugural edition of *Critical Care Explorations*, the official open-access journal of the Society of Critical Care Medicine (SCCM).

"Cerebral vasospasm is frequently present on CT angiography and transcranial Doppler, lacking accurate prediction of DCI or unfavorable outcome after six months," according to the report by J. Joep van der Harst, MD, and colleagues of University of Groningen, The Netherlands. The paper is among the first to be published in the new open-access journal *Critical Care Explorations (CCE)*, which will premiere at SCCM's 48th Critical Care Congress, opening today at the San Diego Convention Center. Designed to complement SCCM's flagship journals *Critical Care Medicine (CCM)* and *Pediatric Critical Care Medicine (PCCM)*, *CCE* provides additional articles and information that encompass the broad scope of critical care.

Study Compares Two Screening Tests for Cerebral Vasospasm after SAH

The prospective study included 59 patients with aneurysmal SAH treated at the authors' neurocritical care unit and neurosurgical ward between 2013 and 2016. At five and ten days, the patients underwent both CT angiography and transcranial Doppler.

The study is the first to directly compare the diagnostic performance of the two tests, which are commonly used for early detection of cerebrovascular spasm (CVS) to detect the "dreaded secondary complication" of DCI. "The optimal screening modality for detecting symptomatic CVS is a matter of debate," the researchers write. (They also note that the causative role of CVS is unproven.)

On both days, CT angiography showed CVS in at least one vessel in nearly all patients. In contrast, transcranial Doppler showed CVS in less than half of patients. Agreement between the two tests was just 0.47.

Sixteen patients had DCI, while 12 patients had unfavorable outcomes at six months. CT angiography was highly sensitive in predicting DCI for prediction of DCI, but it had "extremely low" specificity compared to transcranial Doppler. On day five, accuracy in predicting unfavorable outcomes was 61 percent with transcranial Doppler versus 27 percent with CT angiography.

The results suggest that CVS after aneurysmal SAH is a common finding, and that neither test is an accurate predictor of DCI or unfavorable outcome. "Our study does not support a prominent role of screening with TCD or CTA," Dr. van der Harst and coauthors conclude. "Detection of CVS that does not become clinically manifest likely leads to overtreatment and prolonged hospital stay."

Critical Care Explorations Debuts at the 48th Critical Care Congress 2019

"This prospective study on pressing clinical question is an excellent example of the discovery-centric, evidence-based focus of our new open-access journal," comments *CCE* Editor-in-Chief, Timothy G. Buchman, Ph.D., MD,

MCCM, from Emory University in Atlanta, Georgia. "The open-access journal offers especially timely review, quick publication, and global dissemination

of new ideas and syntheses that practitioners can bring to the bedside."

Critical Care Explorations is designed to facilitate rapid communication of innovations and new information with the potential to influence critical care research and practice. It features a prestigious international Editorial Board with the same rigorous peer-review process as *CCM* and *PCCM*.

"As a fully open-access journal, *CCE's* content is available all the time and is truly global, offering greater opportunities for exploring international perspectives on issues related to critical care," Dr. Buchman adds. Also available to read now are an introductory editorial, describing the vision behind *CCE* and providing practical information on the submission and publication process; as well asas well as a tribute to the late Vladimir ('Vlad') Kvetan, MD, FCCM, renowned for his leadership of Disaster Medicine and for the innovative concept of the 'ICU Without Walls.'

More information: "Transcranial Doppler Versus CT-Angiography for Detection of Cerebral Vasospasm in Relation to Delayed Cerebral Ischemia After Aneurysmal Subarachnoid Hemorrhage", DOI: 10.1097/CCE.0000000000000001 , http://journals.lww.com/ccejournal/Fulltext/2019/01000/Transcranial_Doppler_Versus_CT_Angiography_for.3.aspx

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