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Direct ophthalmoscopy in the evaluation of ED patients with headache - Time to rethink?

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/1742-6723.14176

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It has been asserted, especially by neurologists, that fundoscopic examination (in emergency departments (ED) usually performed by direct ophthalmoscopy) is an essential part of the assessment of patients presenting with acute headache – the principal rationale being the detection of papilloedema suggesting raised intracranial pressure.[1] As such, it is regularly put forward by clinicians providing expert opinions in medical litigation as a component of the standard of care when consideration of what is, and is not, reasonable medical practice is in question.

There is a growing body of research demonstrating that ophthalmoscopy is only performed on a small proportion of patients presenting to ED with headache. In particular, a recent multinational study of patients presenting to ED with headache found that only 7.4% of patients underwent ophthalmoscopy.[2] In the ED setting, even when ophthalmoscopy is performed, research suggests that it has very poor accuracy for detection of serious conditions.[3,4] In addition, little is known about how ophthalmoscopy fits into clinical decision-making in neurologically normal patients presenting with headache in a 21st century ED. These data and knowledge gaps challenge whether ophthalmoscopy should be a standard examination in the contemporary ED assessment of patients with headache, particularly in clinical environments with ready access to CT scanning.

Ophthalmoscopy in the ED is not easy. In the headache subset of a Scandinavian study, direct ophthalmoscopy was only successful in 73% of patients in whom it was attempted and in 10% of patients it was not successful at all.[1] The challenges of the COVID-19 pandemic (social distancing, visors and googles as eye protection for clinicians and enhanced decontamination requirements for equipment) may well have further reduced use of ophthalmoscopy. Does

this matter when CT scanning, and often other neuroimaging, is readily available and highly accurate for detection of raised intracranial pressure?

Head CT scan features have been shown to have good sensitivity for identification of radiographic features suggesting raised intracranial pressure. These include absence or compression of basal cisterns, midline shift, the Marshall classification system and CT-measured optic nerve sheath diameter (ONSD).[5,6] Unfortunately, to date there is no published data on the negative predictive value of a CT without any of these features.[5] In the HEAD study, head CT scan was performed in 37% of patients.[2]

If detection of papilloedema remains important, there are new techniques that have higher accuracy than direct ophthalmoscopy and are more consistent with the infection control principles required in the post-pandemic ED environment. Ocular sonography has been reported to have sensitivity of 95.6% for predicting raised intracranial pressure,[7] however accuracy when performed by ED doctors has been reported to be significantly lower.[8] Fundus photography, using either a special camera or a smartphone app, has also been shown to be quick and feasible and to improve detection by emergency physicians of clinically relevant ocular fundoscopic findings.[3] It also has the potential for remote interpretation of images by neurologists or ophthalmologists by telemedicine, if required.[3]

These new technologies are interesting, but it remains unclear if they add value to the current diagnostic process in ED. There is, to date, no data on to what extent their use changes imaging decisions, referral, disposition or outcome for neurologically normal patients presenting to ED with headache. This is important to clarify before we simply substitute one technology for another.

Given its very limited utility, it may be time for emergency physicians to assert that direct ophthalmoscopy in the ED setting is not standard of care for neurologically intact ED patients with headache and to focus on appropriate use of CT scanning when clinical features are concerning.

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