

Utility of CT Perfusion Imaging for Diagnosis and Management of Delayed Cerebral Ischaemia Following Subarachnoid Haemorrhage

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Abstract : Introduction: Diagnosing delayed cerebral ischaemia (DCI) following aneurysmal subarachnoid haemorrhage (SAH) can be challenging, particularly in poor-grade patients. Objectives: This study sought to assess the value of routine CTP in identifying (or excluding) DCI and in guiding management. Methods: Eight-year retrospective neuroimaging study at a large UK neurosurgical centre. Subjects included a random sample of adult patients with confirmed aneurysmal SAH that had a CTP scan during their inpatient stay, over a 8-year period (May 2014 - May 2022). Data collected through electronic patient record and PACS. Variables included age, WFNS scale, aneurysm site, treatment, the timing of CTP, radiologist report, and DCI management. Results: Over eight years, 916 patients were treated for aneurysmal SAH; this study focused on 466 patients that were randomly selected. Of this sample, 181 (38.84%) had one or more CTP scans following brain aneurysm treatment (Total 318). The first CTP scan in each patient was performed at 1-20 days following ictus (median 4 days). There was radiological evidence of DCI in 83, and no reversible ischaemia was found in 80. Findings were equivocal in the remaining 18. Of the 103 patients treated with clipping, 49 had DCI radiological evidence, in comparison to 31 of 69 patients treated with endovascular embolization. The remaining 9 patients are either unsecured aneurysms or non-aneurysmal SAH. Of the patients with radiological evidence of DCI, 65 had a treatment change following the CTP directed at improving cerebral perfusion. In contrast, treatment was not changed for (61) patients without radiological evidence of DCI. Conclusion: CTP is a useful adjunct to clinical assessment in the diagnosis of DCI and is helpful in identifying patients that may benefit from intensive therapy and those in whom it is unlikely to be effective.

Keywords : SAH, vasospasm, aneurysm, delayed cerebral ischemia

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