Peripartum Brain Scan: Worth the Weight?

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Introduction: High cost imaging such as MRI, MRA/V, and CT is commonly used to evaluate neurological complaints and is frequently cited as one of the primary drivers of escalating healthcare spending [1,2]. We studied the utilization of brain imaging in peripartum patients and identified predictors of abnormal scans based upon patient presenting symptoms, signs, and co-morbidities.

Methods: A retrospective review (2006-2010) of consecutive peripartum patients at the Massachusetts General Hospital identified those who were evaluated with brain imaging because of the onset of acute neurological symptoms. Brain imaging modalities included CT, MR parenchymal imaging, and MR angiography/venography. Patients with acute trauma or those who underwent imaging for follow-up of a known intracranial lesion were excluded. Positive studies were defined as new imaging findings that directly altered clinical management. Data collected included demographics, presenting symptoms, co-morbidities, neuroimaging modality, and findings. Frequencies of presenting symptoms and co-morbidities were compared in imaged patients with and without positive findings using chi-square or Fisher’s exact test, as appropriate.

Results: Of the 166 patients who underwent neuroimaging, the most common presenting symptoms were headache (71.2%), focal neurological deficit (46.4%), and seizure (8.4%). Twenty nine (17.5%) of the imaged patients had abnormal brain scans; the most common findings were hemorrhagic stroke (37.9%), ischemic stroke (20.7%), posterior reversible encephalopathy syndrome (PRES) (20.7%), venous sinus thrombosis (17.2%), and vertebral artery dissection (10.3%). Compared to those with negative studies, patients with abnormal scans were more likely to have headache of sudden onset (41.4% vs. 19.7%, p=0.012), seizure (20.7% vs. 5.8%, p=0.009), eclampsia (13.8% vs. 0%, p=0.001), or neck stiffness (10.3% vs. 1.5%, p=0.038).

Conclusion: In an increasingly cost-conscious healthcare environment, one of the proposed ways to manage expenditures is to limit the use of high cost imaging. In peripartum patients imaged at our institution, almost 1/5 had significant pathology on brain imaging. Diagnoses were typically those associated with specific treatment plans. Headache of sudden onset was a particularly common presentation in patients with subsequent abnormal brain scans and was a predictor of abnormal findings in our cohort. Further investigation is needed to elucidate patients who can safely avoid high cost diagnostic imaging.