DIAGNOSTIC ACCURACY OF CONTRAST-ENHANCED MR ANGIOGRAPHY AND NON-CONTRAST PROTON MR IMAGING COMPARED WITH CT PULMONARY ANGIOGRAPHY IN CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION

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Objective:

To evaluate the diagnostic accuracy of contrast enhanced MR angiography (ce-MRA) and the added benefit of non-contrast proton MR angiography compared to CTPA in patients with chronic thromboembolic disease (CTE).

Methods:

Retrospective study of 53 consecutive patients diagnosed with chronic thromboembolic pulmonary hypertension (CTEPH) who underwent CTPA and MRI for suspected PH and a control group of 36 patients with normal pulmonary artery pressure and no CT evidence of pulmonary embolism identified from a cohort of patients referred for investigation of suspected PH. Standard ce-MRA and non-contrast proton MRA using a 2D balanced steady state free precession sequence were performed on a 1.5T scanner. MRI scans were assessed for CTE, depiction of the level and pattern of disease. The combined diagnostic accuracy of ce-MRA and non-contrast proton MRA was determined. Ce-MRA generated qualitative perfusion maps were also visually assessed for segmental perfusion defects.

Results:

The overall sensitivity, specificity, positive predictive value, negative predictive value of c-MRA in diagnosing proximal and distal CTE was 98%, 94% , 96% and of 97% respectively. The sensitivity improved from 50% to 87.9% for central vessel disease when ce-MRA images were analysed with non-contrast proton MRA as an added sequence. The ce-MRA identified more stenosis (29/18), post-stenosis dilatation (23/7) and occlusion (37/29) when compared to CTPA. The ce-MRA perfusion images showed a very high sensitivity (92%) for diagnosing CTE.

Conclusion:

Our results show that ce-MRA has a very high sensitivity and specificity for diagnosing presence or absence of CTE. The sensitivity of ce-MRA for visualization of adherent central and lobar thrombus significantly improves with the addition of the non-contrast proton MRA that clearly delineates the vessel wall. CTPA is superior for depiction of intraluminal webs and sub-segmental disease, while c-MRA is superior in representing stenosis and post-stenotic dilatations.