

## Magnetic resonance imaging and ultrasonography in diagnosis of pelvic vein thrombosis during pregnancy

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### Introduction:

Pelvic deep vein thrombosis (DVT) is difficult to diagnose during pregnancy. In a two-center trial, we evaluated the agreement between ultrasonography and magnetic resonance imaging (MRI) in diagnosing the extent of DVT into the pelvic veins during pregnancy.

### Materials and methods:

Twenty seven pregnant women with clinical signs of proximal DVT were examined both with ultrasound and MRI, according to the study protocol. Thigh veins up to the abdominal inferior vena cava were imaged. Ultrasound was performed by specialist with 15-17 years of vascular ultrasound with Doppler and compression techniques. The MRI sequences consisted of a 2D Time of Flight (TOF) angiography with arterial flow suppression and maximum intensity projection (MIP) reconstructions; a 3D, T1-w-prepared gradient echo sequence with fat saturation (THRIVE) for thrombus imaging; a steady-state free precession sequence (BFFE-balanced fast field echo); and a Turbo-Spin-Echo (TSE) were performed. No contrast agent was used. Proportion of agreement ( $\kappa$ ) for detection of DVT in individual veins was measured for different ipsilateral veins and inferior vena cava.

### Results:

All patients were imaged with both techniques at an average gestational age of 29 weeks (range 23-39). Three cases (11.5%) of DVT in the pelvic veins were missed on ultrasound but detected by MRI. The upper limit of the DVT was always depicted at a higher (20 cases, 65.4%) or the same level (seven cases, 34.6%) on MRI than on ultrasound.  $\kappa$  was 0.33 (95% CI 0.27-0.40) demonstrating fair agreement.

24 patients had follow-up MRI at about six months, which revealed sequelae from the previous episode of DVT. All of these patients had some fibrotic venous bands and diminished caliber in at least some veins six months after the DVT, 21 (87.5%) patients had increased collateral flow and 21 (87.5 %) had complete lack of flow in at least some veins.

### Conclusion:

Our study suggests that in pregnant women there is only fair agreement between ultrasound and MRI for determination of extent of DVT into pelvic veins, with MRI showing consistently more detailed depiction of degree of extension. MRI could be essential or at least complementary in diagnosis of pelvic DVT during pregnancy.