Diagnosing Venous Thromboembolism in Pregnancy

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Venous thromboembolism (VTE), which includes deep vein thrombosis (DVT) and pulmonary embolism (PE), is one of the leading causes of maternal mortality. However, the diagnosis of VTE can often be challenging and requires a high index of suspicion. Potential signs and symptoms of VTE in pregnancy are common and often reflect normal physiologic changes. Existing clinical prediction tools and diagnostic imaging for VTE have not been prospectively validated in the pregnant population.

Diagnosing DVT

Compression ultrasound is the preferred imaging modality for DVT.[1] It is highly sensitive and specific for proximal thrombus. However, the safety of withholding anticoagulation after a single negative ultrasound is unclear. A repeat ultrasound within one week is recommended for patients with a negative study and high clinical suspicion.

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Venography is rarely employed as it requires the use of iodinated contrast and radiation exposure. The use of abdominal shielding limits the visualization of pelvic and iliac veins.

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Diagnosing PE

The optimal approach to suspected PE in pregnancy has not yet been evaluated. Initial investigations to exclude alternative diagnoses should include:

- a chest x-ray and
- ECG.

Arterial blood gas measurements are of limited value. The alveolar-arterial oxygen gradient is normal in > 50% of pregnant patients with proven PE.[2] D-dimer levels are commonly elevated in normal pregnancy; therefore, routine testing should be avoided. A bilateral compression ultrasound should be performed if it is readily available.[1]

The presence of DVT indirectly establishes a diagnosis of PE and additional imaging is not necessary. If no DVT is detected, specific pulmonary imaging is required.

V/Q scans and CTPAs

A ventilation/perfusion (V/Q) scan and CT pulmonary angiogram (CTPA) are routinely employed for the diagnosis of PE. Many authorities still recommend a V/Q scan as the first-line modality in pregnancy.[1] However, the eventual choice of a V/Q scan or CTPA is often influenced by local availability and maternal preference.

A high probability V/Q scan confirms PE and a normal scan excludes it. V/Q scans are diagnostic (*i.e.*, high probability or normal) in 75% of suspected patients.[3] CTPA is both sensitive and specific for PE and can provide an alternate diagnosis.[4]

Health concerns

There are concerns regarding high maternal ionizing radiation exposure and the use of iodinated contrast with CTPAs. Estimated fetal radiation exposure with either a V/Q scan or CTPA is well within allowable limits but is less with CTPA.

A V/Q scan has been reported to be associated with a small increased risk of childhood malignancy compared to CTPA, but with a lower risk of maternal breast cancer.[1]

If a V/Q scan or CTPA is non-diagnostic, but a high index of suspicion remains, alternative or repeat testing should be considered.

Pulmonary angiograms remain the standard reference for PE; they require a high level of expertise but are rarely used due to their invasive nature. Dx

Take-home message

- Venous thromboembolism (VTE) one the leading causes of maternal mortality
- Clinical diagnosis of VTE in pregnancy is unreliable
- A ventilation perfusion scan or a CT pulmonary angiogram does not expose the developing fetus to a radiation dose that compromises its well-being
- Repeat or alternate imaging should be performed if the index of suspicion is high for VTE, even after a negative initial study

References
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