Reporting accuracy of VQ SPECT in the pregnant population

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Introduction

• Thromboembolism is one of the leading causes of maternal morbidity & mortality.
• Due the physiological changes associated with pregnancy (Figure 1) result in a significantly higher incidence of thromboembolism.
• High prevalence and the risks to both the mother and foetus mean that it is crucial to accurately diagnose of pulmonary embolism (PE).
• We aim to audit the reporting accuracy of SPECT VQ imaging in the pregnant population.

Figure 1: Virchow’s triad; during pregnancy and puerperal females are at a higher risk of thrombosis due to the physiological changes experienced during gestation.

Method

• Audited the consecutive pregnant VQ SPECT patients for the period August 2014 to June 2017.
• e-Health records were followed up to 6 weeks postpartum checking repeat admissions, medication, and any follow up clinics or continued care.
• As there is currently no gold standard for diagnosis of PE, the final clinical diagnosis was treated as the true diagnosis.
• Normal scan reports (no PE) together with no final clinical diagnosis of PE or intervention in the period up to 6 weeks post partum were concluded as a true negative.

Results

• 331 patients were investigated (age 17-46 years; gestation 3-40 weeks).
• The VQ SPECT reports (Figure 3) were 81% negative (n=267), 7% positive (n=23) and in 12% of the studies it was not possible to exclude PE (n=41). The indeterminate studies were further investigated and finding compared to the reporting guidelines published by EANM [1, 2]. Of the 41 studies, 32 were reclassified as negative: 5 positive; and 4 studies were truly indeterminate due to compromised image quality. (Figure 3)
• VQ SPECT in the pregnant population has sensitivity = 86%, specificity = 99% and accuracy of reporting = 98%.

Figure 3: Summary statistics of the reported result for the audited VQ SPECT studies. The results that were originally reported as equivocal were reclassified using the EANM reporting guidelines [1,2].

Conclusions

VQ SPECT is a useful and accurate tool to exclude PE in the pregnant population. Due to the significantly lower maternal radiation dose burden, well acceptable foetal dose [3], and a higher sensitivity for small PE, VQ SPECT imaging should be the initial investigation of choice for suspected PE in pregnant and post partum patients (Figure 4).

Figure 4: Decision tree for the investigation of PE in the pregnant and post partum population.

References


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