**Appropriateness of usage of computed tomography pulmonary angiography (CTPA) and isotope perfusion scan in the investigation of suspected pulmonary embolism in pregnancy**

**Descriptor:**

Imaging of suspected pulmonary embolism (PTE) in pregnancy is a difficult clinical decision. This is because the symptoms are common and non-specific and the definitive investigation exposes the mother and the foetus to ionizing radiation. The aim of this audit is to assess the appropriateness of CTPA and isotope lung perfusion examinations performed and ensure that appropriate protocol has been followed.

**Background:**

Venous thromboembolism (VTE) is the main direct cause of maternal death in the UK [1]. The subjective clinical assessment of VTE is unreliable and assessment of d-dimer level is not helpful in pregnancy [2].

When pulmonary embolism is suspected in pregnancy, Royal College of Obstetricians and Gynaecologists advise the following investigations [3]:

1. An electrocardiogram (ECG) and a chest X-ray (CXR).

2. In women with suspected PE who also have symptoms and signs of DVT, compression duplex ultrasound should be performed. If compression ultrasonography confirms the presence of DVT, no further investigation is necessary and treatment for VTE should continue.

3. In women with suspected PE without symptoms and signs of DVT, a ventilation/perfusion (V/Q) lung scan or a computerised tomography pulmonary angiogram (CTPA) should be performed.

4. When the chest X-ray is abnormal and there is a clinical suspicion of PE, CTPA should be performed in preference to a V/Q scan.

## The Cycle

**The standard:**

Prior to a CTPA or a perfusion scan:

1. An ECG and CXR should be performed within the preceding 24 hour period.

2. In women with suspected PE who also have symptoms and signs of DVT, compression duplex ultrasound should be performed. If compression ultrasonography confirms the presence of DVT, no further investigation is necessary and treatment for VTE should continue.

**Target:**

1. 100% of patients should have an ECG and CXR prior to CTPA or perfusion scan.

2. 100% of patients with signs and symptoms of DVT should have a duplex Doppler and this should not demonstrate deep vein thrombosis (100% negative scan) if the patient is going for a CTPA or isotope perfusion scan

## Assess local practice

**Indicators:**

1. Percentage of patients who had an ECG and a CXR prior to CTPA or perfusion scan

2. The percentage of patients with signs and symptoms of DVT who had a negative duplex Doppler scan prior to CTPA/Duplex Doppler scan

**Data items to be collected:**

1. List of patients in pregnancy who underwent CTPA or isotope perfusion scan, the findings of these CTPA or isotope perfusion scans, and state why either CTPA or isotope perfusion had been selected for each patient.

2.The presence of preceding CXR - within 24 hours immediately prior to CTPA or isotope perfusion scan

3. Finding on CXR: Alternative diagnosis/ Non-specific abnormality/ Normal CXR

4. The presence of preceding Duplex Doppler scan

5. Result of duplex Doppler: Normal/ Positive/ Indeterminate

**Suggested number:**

50 patients

**Suggestions for change if target not met:**

Feedback results to both radiology and obstetric colleagues. Provide refresher of guidance and appropriate protocol

**Resources:**

Data collection – 4 hours

Data analysis - 4 hours

Report writing - 2 hours

**References:**

1. Hobohm, L, Keller, K, Valerio, L, Ni Ainle, F, Klok, FA, Münzel, T, et al.. Fatality rate and use of systemic thrombolysis in pregnant women with pulmonary embolism. ESC Heart Fail 2020;7:2365–72. <https://doi.org/10.1002/ehf2.12775>.
2. Venous thromboembolic diseases: diagnosis, management and thrombophilia testing NICE guidelines [NG158], 2012. Published March 2020.

1. The acute management of thrombosis and embolism during pregnancy and the puerperium, Royal College of Obstetricians and Gynaecologists, Green-top Guideline number No. 37b, April 2015.
2. Prevention and management of venous thromboembolism. SIGN guidelines [122], December 2010, updated October 2014. <http://www.sign.ac.uk/assets/sign122.pdf>
3. van Mens, T., Scheres, L., de Jong, P., Leeflang, M., Nijkeuter, M. and Middeldorp, S. (2017). Imaging for the exclusion of pulmonary embolism in pregnancy. Cochrane Database of Systematic Reviews.
4. Elliott, C. (2012). Evaluation of Suspected Pulmonary Embolism in Pregnancy. Journal of Thoracic Imaging, 27(1), pp.3-4.

**Submitted by:**

Dr. Dilrukshi Kamanimala Gunatillake, updated by Dr H Bailey 2018

**Published Date:**

Monday 6 June 2011

**Last Reviewed:**

Wednesday 20 July 2022