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R2 CAT Block 3 2013

Reference:

Ayaram,D., et al. Triple Rule Out Computed Tomographic Angiography for Chest Pain: A Diagnostic Systemic Review and Meta-Anlysis, Journal of the Society for Academic Emergency Medicine; Sep 2013

Clinical question:

Is TRO CCTA as effective and safe as traditional dedicated PE, coronary and aortic dissection imaging?

Introduction:

TRO CCTA is an emerging imaging modality to evaluate the coronary arteries, and simultaneously visualizes the pulmonary arteries and thoracic aorta. This study was a meta-analysis to evaluate the effectiveness compared to traditional CT imaging.

Methods:

Analysis included research studies that enrolled adults >18 with non-traumatic shortness of breath, chest pain, or symptoms suggestive of ACS, PE, or aortic dissection. All studies had to be with a 64 slice ct or greater. Total of 733 studies screened of which 722 did not meet criteria and 11 studies were evaluated. A total of 3539 patients were enrolled with 791 being triple rule out.

Results and discussion:

Diagnostic Accuracy - Based on 4 of the studies with a total of 995 patients TRO-CT was found to highly effective for diagnosis of CAD. If no lesions are present the diagnosis is effectively ruled out. Sensitivity 94.3% and specificity of 97.4%. There were too few patients diagnosed with pulmonary embolism or aortic dissection, eight and zero respectively, to make any comparison or recommendation. The meta-analysis therefore was limited to evaluation of ACS only.

Radiation exposure – Five studies provided data on radiation exposure with a total of 2307 patients. 377 patients in the TRO group and 1930 in the control group. The TRO group received on average 4.84 mSv more radiation than the control group. The average for the TRO group was 17.4 mSv and for the control it was 12.6% or approximately a 38% increase over standard imaging.

Contrast Exposure - Five studies provided data on contrast volume administration. A total of 2307 patients were included, 377 patients in the TRO group, and 1930 patients in the control group. Pts in the TRO received greater contrast than the control group, 129.2mL and 91.2mL respectively or a 42% increase.

Overall the meta-analysis only evaluated diagnostic criteria for ACS which was not the true intent of the study. Without evaluating rule out for PE or aortic dissection the risks of greater contrast and radiation exposure would not be acceptable just to rule out ACS based on this study alone. As with most studies, further research is needed.
