Breast dose matters

This high quality meta-analysis by Tromeur *et al.*[1] imparts great additional value to the recent Cochrane review on this topic of the evaluation of pulmonary embolism in pregnancy.[2] Specifically, it is quite impressive that both computed tomography pulmonary angiography (CTPA) and ventilation-perfusion (VQ) imaging have a pooled negative predictive value of 100% and the pooled rates on non-diagnostic results are comparable in this population.

We however differ regarding the maternal breast radiation exposure. There is an error in referencing Mitchell *et al.*[3] in Table 4: the paper does not state the maternal effective doses at all for pregnant patients and the mean breast effective doses are incorrect. Mitchell *et al.*[3] were able to reduce the mean breast dose from 7.64 mGy to 3.65 mGy utilizing a reduced 80 kV monitoring scan prior to the diagnostic scan. This paper does not give a dose range, thus approximately 50% of pregnant patients' breast dose was more than 3.65 mGy.[3] Low-dose perfusion imaging as described by Tromeur *et al.*[1] utilizes 25% of a conventional perfusion dose, thus imparts 25% of the radiation to the maternal breast, maternal whole body and fetus: 0.16 mGy, 0.47 mGy and 0.02 mGy respectively.[4] The CTPA maternal breast dose is at least 22 times higher than that of low dose perfusion imaging, and this is not insignificant given the increased breast mitotic rate during pregnancy. It is interesting that the short term breast cancer rate was not increased post CTPA. However, the majority of the CTPA patients were postpartum when the mitotic rate is normal, while the majority of patients who underwent VQ imaging were pregnant when the mitotic rate is increased.[5,6] Limiting detection, screening has not yet begun for these cohorts.[6]

We agree that the fetal dose of both CTPA and VQ are negligible, but given the at least 22-fold increase in breast dose for CTPA, low-dose perfusion imaging is preferred in the setting of a normal chest radiograph.

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