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Title: Predicting pulmonary hypertension with standard computed tomography angiography

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Body: Rationale: Since standard non-ECG gated computed tomography angiography (CTA) is a widely available and frequently used diagnostic test and is part of the normal clinical work-up of pulmonary hypertension (PH), predicting PH by CTA could be of clinical interest. Although research has shown the value of measurements of the pulmonary artery (PA) for predicting PH, less is known about the predictive value of ventricular measurements on CTA. Objective: To investigate whether the predictive value of CTA for PH can be increased when PA and ventricular measurements are combined. Methods: Retrospective study design. 59 PH patients (48 patients with pulmonary arterial hypertension and 11 patients with chronic thrombo-embolic pulmonary hypertension) and 28 non-PH controls underwent right heart catheterization and CTA. Pulmonary artery/ascending aorta diameter ratio on the axial view (PA/AA_{AX}), right ventricle/left ventricle diameter ratio on the axial view (RV/LV_{AX}) and RV/LV diameter ratio on a manually reconstructed four chamber view (RV/LV_{4CH}) were obtained as CT parameters for predicting PH. Results: Multivariate binary logistic regression analysis showed that only PA/AA_{AX} and RV/LV_{4CH} were independent predictors of PH. The highest sensitivity in combination with the highest positive predictive value (PPV) was obtained when PA/AA_{AX} and RV/LV_{4CH} were combined (Table 1).

CT parameters	Sensitivity(%)	Specificity(%)	PPV(%)	NPV(%)
PA/AA _{AX}	90	61	83	74
RV/LV _{AX}	89	82	91	79
RV/LV _{4CH}	93	89	94	86
Combination				
PA/AA _{AX} + RV/LV _{4CH}	96	93	96	93

Conclusion: Predicting PH using the combination of the PA/AA_{AX} and RV/LV_{4CH} is better than using PA/AA_{AX} alone.