A THREE-ZONE PARTITION FOR PULMONARY ARTERY DIMENSIONS MEASURED BY COMPUTED TOMOGRAPHY TO “RULE IN” AND “RULE OUT” PULMONARY HYPERTENSION

Poster Contributions
Poster Hall B1
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Authors: Asim Rizvi, Qing Zhou, Zachary R. Lavender, Roderick Deano, James Min, Rajeev Malhotra, Quynh Truong, NewYork-Presbyterian Hospital/Weill Cornell Medical College, New York, NY, USA

Background: Computed tomography (CT) measurements of the pulmonary vasculature have been associated with pulmonary hypertension (PH). We aimed to optimize the diagnostic accuracy by constructing a three-zone partition of CT measurements in patients evaluated for PH.

Methods: In 240 patients (age 61±14, 39% male) undergoing CT and right heart catheterization (RHC), we measured diameters of the main pulmonary artery (mPA) and ascending aorta (Ao) in transaxial CT and calculated their ratio mPA/Ao (rPA). In the derivation cohort of 120 patients, we examined various cutpoints including Framingham Heart Study (FHS) sex-specific values of mPA ≤27 mm for women and ≤29 mm for men and ratio PA ≤ 0.9 to maximize sensitivity for “ruling out” PH and specificity for “ruling in” PH. We used the World Health Organization definition for PH, based on RHC parameters as the gold standard for PH diagnosis. We validated the results in a separate cohort of 120 patients.

Results: There were 138 (58%) patients diagnosed with PH. For mPA, using a lower threshold with FHS sex-specific cutpoints and an upper threshold of 34 mm yielded a c-statistic of 0.84. For rPA, using the FHS 0.9 as a lower threshold and an upper threshold of 1.1 yielded a c-statistic of 0.82 (Figure 1). Validation c-statistics were 0.86 for mPA and 0.80 for rPA.

Conclusion: A three-zone partition of mPA and rPA provides excellent diagnostic accuracy for “ruling in” and “ruling out” PH, with less certainty for the grey zone. These values should be used in clinical routine.

Figure 1: