

Summary

Non invasive assessment of pulmonary hypertension on chest radiograph and non contrast CT

Objective: To evaluate relationship between selected qualitative and quantitative parameters and mean pulmonary artery pressure (mPAP) in patients with chronic pulmonary disease. To assess, whether a radiologist with use of a set of measurements in combination with positivity of qualitative findings is able reliably predict presence of pulmonary hypertension (PH) on chest radiographs (CXR) and High-resolution CT (HRCT) of lungs.

To examine reproducibility of the used method by assessment of interobserver agreement between radiologists in diagnosing pulmonary hypertension.

Materials and Methods: 53 individuals with chronic lung disease underwent right heart catheterisation, CXR and HRCT. 30 patients had PH confirmed. CXRs and HRCTs were reviewed independently by three radiologists who besides evaluation of findings stated whether PH is present. Relation between relevant parameters and mPAP, agreement between radiologists and real presence of PH were assessed.

Results: The strongest correlation on CXR was found between mPAP and ratio of right descending pulmonary artery width and the left main bronchus ($r = 0,256650$, $p = 0,023362$) and right descending pulmonary artery width ($r = 0,188897$, $p = 0,002048$). The strongest correlation on CXR was found between mPAP and pulmonary artery diameter ($r = 0,396894$, $p = 0,000001$) and PA/AA ratio ($r = 0,382652$, $p = 0,000002$). The cut-off value for PH for PA width was 31,2 mm with specificity 80,769 % and sensitivity 68,182 %. Agreement between radiologists and value of mPAP was in CXRS 58,49 %, 54,72 % and 64,15 %, in HRCT of the lungs 70,83 %, 60,42 % and 62,50 %. Interobserver agreement between radiologists in diagnosing pulmonary hypertension varied, the best value varied, the best value in CXR was 84,91 %, in HRCT it was 87,50 %.

Conclusion: Width of pulmonary arteries and mPAP are related. If specific imaging findings are present, PH can be suspected. If absent, the PH can be ruled out with high likelihood. Interobserver agreement in assessment of pulmonary hypertension on CXR and HRCT with use of the same methodology is high.