SS 10 CH-12 17:50

Density of thoracic vertebral bodies on chest CT in patient with COPD: correlation with CT, PFT and other clinical parameters

Sang Min Lee, Joon Beom Seo, Ji Eun Kim, Namkug Kim, Jae Seung Lee, Yeon-Mok Oh, Sang-Do Lee
Asan Medical Center, Korea.
joonbeom.seo@gmail.com

PURPOSE: Patients with COPD are known to be at risk of osteoporosis. The purpose of this study is to know the clinical meaning of CT density of thoracic vertebral bodies (D_{Thorax}) measured at CT of COPD in terms of correlation with other parameters of COPD.

MATERIALS AND METHODS: Total 325 patients with COPD (M:F = 301:24; mean age, 65.59 years) were retrospectively enrolled between May 2005 and October 2011. All patients had chest CT scan, PFT, DLCO, 6 minute walking test (6 MW) and blood test (platelets, glucose, ESR and CRP), which were done within 1 week. CT scans were performed in all patients at full inspiration from four MDCT scanners (Siemens 16, Philips 16, Philips 40, and Toshiba 64) from different vendors. Images were reconstructed with standard kernels with submilimeter thickness. Using in-house software, D_{Thorax} was measured by averaging the CT values of 3 consecutive vertebral bodies at the level of left main coronary artery with round ROI of 5 mm radius. Emphysema index (EI), which is the percentage of the volume of relatively low attenuation below −950 HU of the lung, was measured. Airway wall thickness (WT) and wall area percentage (WA%) of right apical subsegmental bronchus were measured with full-width-half-maximum method. The correlation between D_{Thorax} and other parameters including 6 MW, blood test, FEV1, FEV1/FVC, EI, WT, and WA% was assessed with Pearson correlation test.

RESULTS: The measured DThorax was 128.77 ± 50.28 HU (average ±SD). DThorax showed significant positive correlation with DLCO, 6MW and FEV1 and significant negative correlation with EI, and platelets (all $p < 0.01$). However, there was no significant correlation with WT, WA%, glucose, ESR, CRP or FEV1/FVC ($p > 0.05$).

CONCLUSION: The degree of osteoporosis measured with DThorax correlated with the degree of airflow limitation, parenchymal destruction, decreased diffusion capacity and decreased exercise capacity in patients with COPD.