

Visual assessment of CT findings in GOLD-unclassified smokers in the COPDGene study: comparison with smoking control group

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PURPOSE: In the COPDGene study population of > 10,000 smokers, 9% were found to have post-bronchodilator FEV1/FVC ratio > 0.7 and FEV1 < 80% predicted, and are therefore unclassifiable by Global Initiative for Obstructive Lung Disease (GOLD) criteria. The purpose of this investigation was to identify differences in CT findings between this GOLD unclassified (GOLDU) group of individuals and a control group of smokers without COPD (GOLD0).

MATERIALS AND METHODS: CT images of 200 participants in the COPDGene study (100 GOLDU, 100 GOLD0) were retrospectively evaluated. Visual CT assessment included lobar analysis of emphysema (type, extent), presence of airway wall thickening, expiratory air trapping, centrilobular nodules, atelectasis, nonfibrotic and fibrotic interstitial lung disease, changes in diaphragm and internal thoracic diameters (in mm). Univariate analysis for each CT parameter was included between groups. Multiple logistic regression was performed to determine imaging features associated with GOLDU status after adjusting for age, race, gender, and BMI.

RESULTS: When compared with the GOLD0 group, GOLDU subjects had a significantly higher prevalence of diaphragm eventration (35% vs. 13.5%), airway wall thickening, expiratory air trapping, centrilobular nodules, reticular abnormality, paraseptal emphysema (30% vs. 10%), linear atelectasis (58% vs. 41%), kyphosis (15% vs. 6%), and a smaller internal transverse thoracic diameter (254 ± 23 vs. 263 ± 22) (all $p < 0.05$). With logistic regression, transverse internal thoracic diameter remained significantly associated with GOLD U status ($p < 0.001$).

CONCLUSION: In cigarette smokers, chest wall abnormalities and parenchymal lung disease are associated with GOLD-unclassified status.