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慢性阻塞性肺疾病患者支气管壁厚度与肺功能的相关性

Correlation of airway wall thickness with pulmonary function in patients with chronic obstructive pulmonary disease

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中文关键词: [体层摄影术](#) [X线计算机](#); [肺部疾病](#) [阻塞性](#); [肺功能检查](#)

英文关键词: [Tomography](#) [X-ray computed](#); [Pulmonary diseases](#) [obstructive](#); [Pulmonary function test](#)

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中文摘要:

目的 分析各级慢性阻塞性肺疾病(COPD)患者右肺上叶尖段支气管壁厚度的变化, 评估管壁厚度与肺功能的相关性。**方法** 对经临床诊断为1-4级COPD的患者各15例, 共60例(COPD组)和15名正常体检者(正常对照组), 均在1周内分别接受64层MSCT扫描和PFT肺功能检查, 在与右肺上叶尖段支气管垂直层面图像上测量支气管壁厚度, 计算壁厚直径比(TDR)、支气管壁面积百分比(WA%), 分析各指标的变化, 评估其与肺功能的相关性。**结果** COPD组支气管壁较正常对照组明显增厚, 且随着级别的提高逐渐增厚, 各级别的TDR、WA%值均高于正常对照组, 差异有统计学意义($P < 0.05$); TDR和WA%与第1秒用力呼气量实测值占预测值百分比、用力呼气中段流量、第1秒用力呼气量占用力肺活量的百分比和一氧化碳弥散量均呈负相关, 与残气量与肺总量的比值(RV/TLC)呈正相关($r=0.77, 0.76$), P 值均 < 0.05 。**结论** 各级COPD患者右肺上叶尖段支气管的TDR和WA%与其肺功能指标存在良好的相关性, 可以较准确、直观地评估其气道重构、气道直径与气流受限的关系, 可作为评估气流受限较敏感的标志。

英文摘要:

Objective To analyze the changes in apical segmental bronchus thickness of the right upper lobe in patients with different grades of chronic obstructive pulmonary disease (COPD), and to assess the relationship between airway wall thickness and lung function test (PFT). **Methods** Both 64-slice spiral CT scans and PFT were performed on 60 patients with COPD in stage 1-4 (COPD group) and 15 normal healthy adults (control group). On the perpendicular airway images of apical segmental bronchus of the right upper lobe, airway wall thickness was measured, then the airway wall thickness to airway diameter ratio (TDR) and the percentage of airway area to total airway cross sectional area (WA%) were calculated. Changes were analyzed between every index. Relationship between the measurements and PFT was observed. **Results** TDR and WA% of COPD group were significantly higher than those of healthy subjects group (all $P < 0.05$), and went worse gradually following the grading of COPD. TDR and WA% negatively correlated with ratio of measurement to prediction of forced expiratory volume at the first second (FEV1%), forced expiratory flow during middle half of FVC (FEF25%-75%), ratio of the first second forced vital capacity (FEV1/FVC%) and diffusing capacity of the lung for carbon monoxide (DLCO), positively correlated with ratio of residual volume to total lung capacity (RV/TLC). **Conclusion** There are marked correlation in both TDR and WA% on apical segmental bronchus of the right upper lobe and the parameters of PFT in patients with different grades of COPD. The measurement and calculation of airway wall thickness is helpful to the accurate and direct evaluation on the reconstruction of airway, as well as the relationship between airway dimension and airflow limitation.

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