



Computerized auscultation for the diagnosis of COPD

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Article

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Abstract

Spirometry, the gold standard for COPD diagnosis, results in a substantial proportion of undiagnosed subjects with mild airflow obstruction. Optimal screening methods for COPD are still to be identified. Computerized auscultation of respiratory sounds (RS) provide information on the respiratory system by nearly universally means. RS may thus contribute for early diagnosing COPD, but differences between healthy subjects and subjects with mild COPD have not been explored.

This study compared RS between healthy subjects and subjects with mild COPD.

10 healthy subjects (65±7y; FEV₁ 100±15% pred) and 13 subjects with mild COPD (68±8y; FEV₁ 88±8% pred) participated. RS were recorded at posterior right chest using a stethoscope with a microphone in the main tube. Airflow was standardized (0.4-0.6l/s) with a pneumotachograph. Breathing phases were detected using airflow signals and RS with developed algorithms. Inferential statistics included independent t-tests, Mann-Whitney U-tests and simple logistic regressions.

Subjects with mild COPD presented significantly more inspiratory crackles (OR=5.18[95%CI 1.2-21.4]) and higher intensity in expiratory normal RS (OR=2.5[95%CI 1.1-5.9]) than healthy subjects.

Inspiration	Healthy	Mild COPD
No. Crackles	0.8[0.6, 2.4]	2[1.3, 3.9]*
Wheeze occupation rate,%	0[0, 0]	0[0, 5.3]
NRS mean intensity,dB	8.2±1.1	8.7±1.6
Expiration		
No. Crackles	0.8[0.7, 1.5]	2.4[1.2, 4.8]

Wheeze occupation rate,%	0[0, 0.7]	0[0, 4.7]
NRS mean intensity,dB	7.9±1.0	9.7±1.7*

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Data are presented as median[interquartile range] or mean±SD, *p<0.05

RS parameters

Computerized auscultation at posterior chest can aid in COPD diagnosis, this can be especially valuable in primary care or resource-constrained settings.

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