Computerised respiratory sounds can differentiate smokers from non-smokers

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Abstract

Cigarette smoking is associated with the development of respiratory diseases however, if diagnosed early, changes in the lung tissue may be reversible. Computerised respiratory sounds, namely crackles, are sensitive to detect changes within the lung tissue before other measures, however it is unknown if it is able to detect changes in the lungs of healthy smokers. This study investigated the differences in crackles between healthy smokers and non-smokers.

Healthy participants were recruited from a university campus. Respiratory sounds were recorded simultaneously at 4 chest locations (right and left anterior and posterior) using air-coupled electret microphones. Airflow (1.0-1.5 l/s) was recorded with a pneumotachograph. Breathing phases were detected using airflow signals and crackles (number and type–fine/coarse) with validated algorithms.

Thirty-two participants were enrolled: 19 non-smokers (25.1±3.4y; FEV_1 101.7±11.6% predicted) and 13 smokers (24.1±10y; FEV_1 102.5±8.2% predicted). Smokers presented significantly more inspiratory fine crackles (p=0.010) at anterior regions and more expiratory fine crackles at posterior regions (p=0.015) No other significant differences were found.
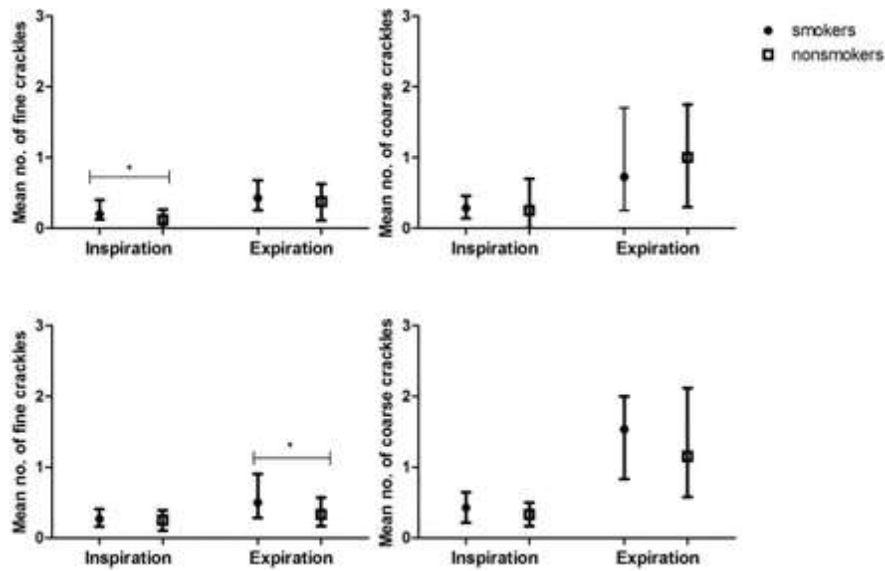
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Smokers presented more fine crackles than non-smokers. Fine crackles are often the earliest sign of disease, often present before detection of changes in radiology. Thus, crackles might be a promising measure to early detect respiratory diseases in smokers.

Monitoring   Spirometry   Inflammation

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