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Are computerized respiratory sounds correlated to patient-centered outcomes in COPD?

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Abstract

No single measure can assess the effectiveness of interventions in COPD. The latest American Thoracic Society/European Respiratory Society research statement on COPD recommends studies correlating physiological and anatomical outcomes with patient-centered outcomes to identify high-quality surrogate outcomes. Computerized respiratory sounds (CRS) are a physiological and non-invasive measure to assess lung function, but relationships between this surrogate outcome and patient-centered outcomes are yet little understood. Thus, this study explored correlations between CRS and patient-centered outcomes in patients with COPD after community-based Pulmonary Rehabilitation (PR).

41 patients with COPD (67±9y; FEV1 69±22%pred) completed the PR program. Patient-centered outcomes included rest dyspnea (modified Borg scale), self-reported sputum (scale 0-10), exercise tolerance (6-min walk test) and health-related quality of life (St George Respiratory Questionnaire-SGRQ). CRS were recorded at right/left posterior chest using 2 stethoscopes with microphones in the main tube. Breathing phases were manually annotated and then inspiratory median frequency (F50) of CRS was determined within the frequency bands of 100-300Hz and 300-600Hz. Correlations were explored with Pearson's coefficient (r).

After PR, there were moderate relationships between F50 at 300-600Hz band and dyspnea (r=.41; p=.008), sputum (r=.33; p=.04), SGRQ symptoms (r=.57; p<.001) and SGRQ total (r=.52; p=.001).

F50 correlates moderately with rest dyspnea, self-reported sputum and health-related quality of life at 300-600Hz. These findings are encouraging for the clinical use of CRS as COPD surrogate measure, however further research is needed.