The effect of Chest Physiotherapy with Simeox airway clearance technology in the treatment of CF PEx – Open-label study

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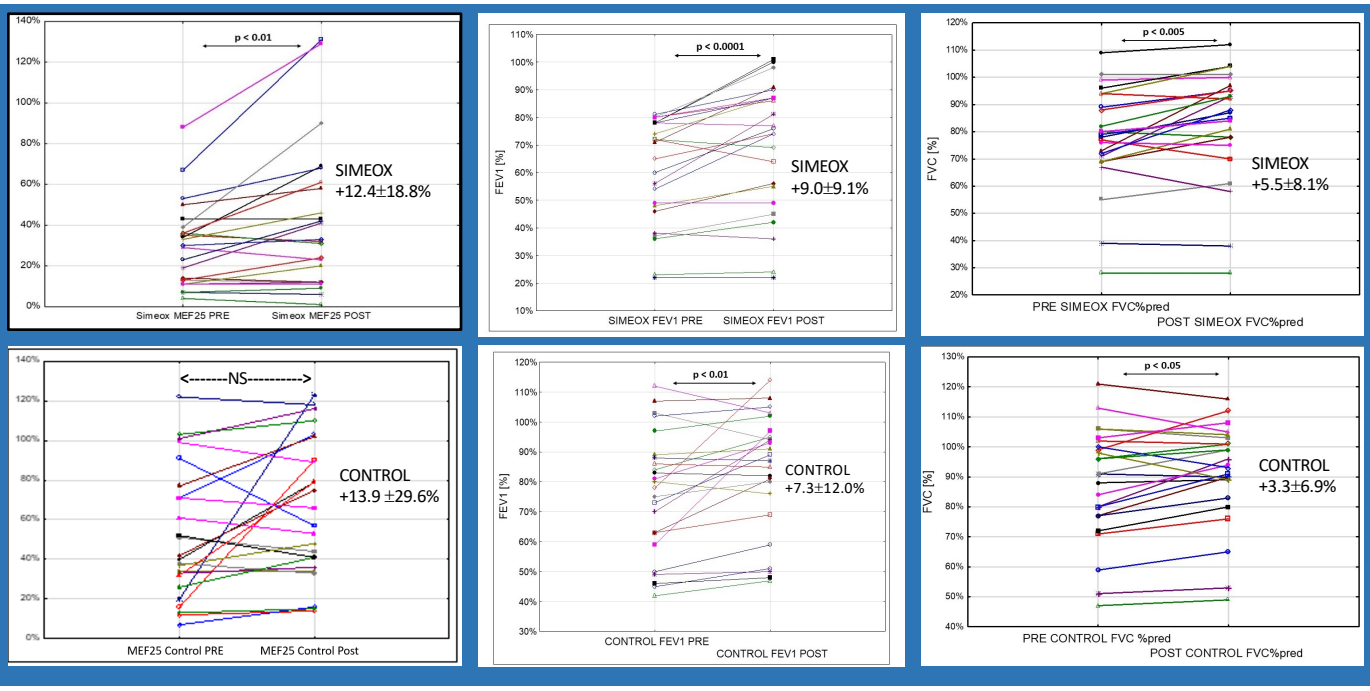
OBJECTIVES:
Chest physiotherapy (CP) plays a crucial role in treatment of lung disease in cystic fibrosis (CF), especially during pulmonary exacerbations (PEx). New airway clearance techniques (ACTs) adapted to individual needs are still being sought to achieve the best effect of airway clearance. The primary aim of this study was to evaluate the efficacy of Simeox technology – a new ACT in subjects with CF who were hospitalized due to PEx.

METHODS:
CF patients aged 10-18y admitted to hospital and requiring IV antibiotic therapy due to PEx were allocated consecutively (1:1) to Simeox arm or usual CP arm without Simeox (Control). Patients performed spirometry and multiple breath nitrogen washout (N_2MBW) for Lung Clearance Index (LCI) assessment on admission and prior to discharge after a 2-week hospitalization period.
Simeox technology delivers a pneumatic vibratory signal during exhalation which liquefies and mobilizes mucus from distal to proximal airways.

RESULTS:
48 CF patients were included: 24 treated with Simeox and 24 using usual CP. In both groups, spirometry parameters (FEV_1, FVC) increased significantly after IV antibiotic therapy. Significant improvement in MEF_{25} was observed only in patients treated with Simeox ($p<0.01$). A similar trend was observed towards lowering LCI ratio in both (Simeox: – 4.4±13.5% vs Control:– 5.0 ± 16.3%).
Drainage with Simeox was not painful for any of the patients and about 80% of them did not feel any fatigue. All patients felt comfortable and >80% learned quickly the use of new ACT. No side effect was observed for each therapy.
After training, 91% of patients thought that they could use Simeox device on their own, and 87% stated that they would like to use it at home. Overall, 62% of patients preferred Simeox device over usual CP and all said that they would recommended the device to other patients.



CONCLUSIONS:
Spirometry parameters increased significantly in CF patients treated for PEx with IV antibiotic therapy and intensive CP. Simeox may improve the drainage of the central and peripheral airways. This new ACT was a safe, well-tolerated method of CP and can be considered an option in treatment of PEx.