

Benefits of Simeox Airway Clearance Technology in Non-Cystic Fibrosis Patients with Bronchiectasis

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Introduction: Airway Clearance Techniques (ACTs) improve bronchial clearance in obstructive lung disease complicated by excessive secretion of sticky and viscous mucus. ACTs are therefore widely recommended as a part of the comprehensive management in bronchiectasis. New techniques have been recently developed as Simeox® (Physio-Assist, France) technology which mobilizes and transports mucus from the distal tracts by disseminating a vibratory pneumatic signal in the bronchial tree during exhalation. **Aims and objectives:** This cohort study aims to compare the clinical benefits of Simeox technology versus manual Chest Physiotherapy (CP) in non-cystic fibrosis (CF) bronchiectasis patients hospitalized for severe exacerbation and requiring airway clearance to reduce pulmonary congestion. **Methods:** A prospective series of non-CF bronchiectasis patients with acute exacerbation received routine pharmacological therapy including antibiotics, inhaled bronchodilators and mucolytics, supported by daily ACT using either Simeox® device or manual CP (control group) for 7 consecutive days. Change in respiratory symptoms, lung function, disease-specific quality of life questionnaire (CAT score) and 6 minute walking distance test (6MWT) were compared between both groups. **Results:** Twenty one patients with a mean age of 65±11 years were enrolled into the study. Vast majority of patients complained of severe dyspnea, intense cough and were full of phlegm at admission. Baseline data were similar between both groups. A second pulmonary function test measurements performed in 14 patients after 7 days of ACT showed in both groups a similar non-significant increase in FEV₁ and FVC and decrease in Raw. Total CAT score significantly improved by 8 points (p=0.008) in Simeox group but not in control group. Also cough intensity, chest congestion and perceived dyspnea decreased significantly in Simeox group (p<0.05) while only cough intensity improved in control group. Management of bronchiectasis exacerbation resulted in significant prolongation by 74±117 m (23%) of distance covered and reduction of oxygen desaturation during exercise by 0.9±1.2 % in the Simeox group compared to baseline (p<0.05). No change was observed in control group. **Conclusions:** Patients with non-CF bronchiectasis of different origin may benefit from the use of ACT during acute exacerbation in hospital setting. Easy to use and efficient airway clearance technology may quickly and significantly improve quality of life and exercise capacity of these patients. Simeox technology was well tolerated by all studied patients and proved to be safe and easy to handle even for older and disabled person.

Table. Results before and after 7 days of ACT.

	SIMEOX group (n=10)			Chest Physiotherapy group (n=8)		
	CAT score	Δ SaO ₂ (%) during exercise	Distance (m)	CAT score	Δ SaO ₂ (%) during exercise	Distance (m)
at admission	23.9±7.9	4.8±7.2	334±119	20.6±10.5	2.1±1.6	382±232
after 7 days	14.8±9.4	4.4±7.6	412±87	16.9±8.6	1.6±1.9	438±188
Δ	-8.0±8.1	-0.9±1.2	74±117	-5.1±4.8	-0.5±1.9	56±107
<i>p</i> value	0.008	<0.05	0.036	0.075	0.67	0.11

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