A randomised crossover trial investigating the effect of a portable positive pressure ventilation device on exercise tolerance in patients with COPD

Background: Dyspnoea is a common symptom in COPD and can lead to progressive decline in exercise capacity. Non-Invasive Ventilation has been shown to improve symptoms and exercise capacity but is clinically impractical due to logistical constraints. A portable ventilation device (Vitabreath) may overcome these barriers and be a useful adjunct therapy.

Aim: To investigate the effect of Vitabreath on exercise capacity in patients with COPD.

Methods: Randomised crossover design; 12 participants with COPD (FEV_1% 45±15) performed 3 Six-Minute Walk Tests using i) Vitabreath, ii) Threshold Positive Expiratory Pressure (PEP), or iii) no device. Primary outcome: six-minute walk distance (6MWD). Secondary outcomes: changes in heart rate, oxygen saturations (SpO_2), dyspnoea, and lower limb (LL) fatigue, and recovery time of each variable.

Results: Mean 6MWD was less using Vitabreath compared to no device (p=0.01). Use of Vitabreath resulted in a smaller change in dyspnoea (p=0.008) and LL fatigue scores (p=0.02), and a faster LL recovery time (p=0.01) compared to Threshold PEP. SpO_2 recovery time was faster using Vitabreath compared to both Threshold PEP (p=0.008) and no device (p=0.03). Parametric data presented as mean ±SD, Non-parametric data presented as median (IQR).

Conclusion: The data suggest no benefit in using the Vitabreath in improving exercise capacity.

	Vitabreath	**Threshold PEP**	**No device**	ANOVA p=
6MWD (m)	417 ±50	430 ±67	465 ±71	**0.01**
Change in Variable				
Dyspnoea (Borg)	2 (1)	3 (1)	3 (2)	**0.03**
LL fatigue (Borg)	0 (2)	2 (1)	1 (1)	**0.03**
Recovery time (seconds)				
LL fatigue	0 (120)	120 (180)	120 (180)	**0.014**
SpO_2	28 (62)	68 (113)	83 (83)	**0.003**