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Background Systemic and airway inflammation are recognised in COPD and reducing inflammation has been postulated to alter disease course¹. Statins have pleiotropic effects including anti-inflammatory properties². A study in asthma showed that statins reduced sputum macrophage levels³. We hypothesised that statins would reduce systemic (hs-CRP) and airway (exhaled nitric oxide: FeNO, sputum neutrophils and macrophages) inflammation in patients with COPD.

Methods Clinically stable patients with confirmed COPD were recruited and randomised to either simvastatin 20mg od (active) or placebo for 6 weeks in a double blinded parallel group randomised controlled trial. Circulating hs-CRP and fasting lipids were measured in all subjects' pre- and post- treatment. 5-flow FeNO and induced sputum were performed in consenting patients where possible pre- and post-treatment. Primary analysis compared the six week change in each inflammatory marker between active and placebo groups.

Results Patients were matched for age, sex, smoking and lung function; active: n = 33, placebo: n = 37. Compliance was good and the active group achieved total cholesterol reduction: between arms mean (95% CI): -1.1 (-1.3, -0.8)mmol/L, p < 0.001. Baseline median (IQR) hs-CRP was 3.09 (1.3–7.4)mg/l but there was no significant change after treatment between active and placebo: between arms mean (95% CI) 0.5(-3.2, 4.1) mg/l. Baseline sputum samples were obtained in n = 27 and 22/27 had neutrophilic sputum. Paired samples were obtained in 20 patients: active n = 8 and placebo n = 12 with no significant difference in change between treatment arms for sputum neutrophils or macrophages. FeNO was measured in 36 patients: active n = 17, placebo n = 19 with no significant difference in change between arms.

Conclusions In this pilot RCT, despite significant lipid lowering, there was no demonstrable systemic or airway anti-inflammatory effect over 6 weeks with simvastatin 20mg od in patients with COPD. Baseline results showed a majority had neutrophilic sputum however only a small proportion had airway inflammation evaluation.

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S28

NEUROMUSCULAR ELECTRICAL STIMULATION (NMES), A NEW STRATEGY IN THE PULMONARY REHABILITATION OF PATIENTS WITH SEVERE AND VERY SEVERE MRC 4 AND 5 CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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Introduction and Objectives Current National Institute of Clinical and Health Excellence (NICE) COPD guidelines (2010) recommend that pulmonary rehabilitation (PR) is made available to all appropriate people with COPD. However, house-bound patients with severe and very severe COPD (MRC 4/5) are not always able to access PR. This creates an inequality in access to health care. This pilot study investigated the effectiveness of home provision of neuromuscular electrical stimulation (NMES) and low-intensity symptom-limited exercise (LISLE) on exercise capacity and health related quality of life in severe and very severe COPD patients.

Methods Patients with severe COPD (MRC 4 and 5) with a mean FEV₁ of 25% predicted (± 7.8) were randomised into two 16-session PR programmes, delivered twice weekly for 8 weeks. Group A received NMES and LISLE while Group B only received LISLE. Primary outcomes were the six minute walk test (6MWT) and the St George's respiratory questionnaire (SGRQ). Secondary outcomes were the London Chest Activity of Daily Living Scale (LCADL), and the Hospital Anxiety and Depression Scale (HADS).

Results Ten patients (5 males) with severe COPD were recruited (mean age: 76 years ± 7.7, BMI: 26 ± 4, MRC: 5 ± 0.3, FEV₁:25 ± 7.8). There were no significant between-group differences in the 6MWT, SGRQ or HADS (p > 0.05), but there was a significant improvement in LCADL in group A compared with group B (median difference: -12 vs -1, p < 0.001). Within-groups, there were significant improvements in the 6MWT, SGRQ and LCADL scores in both groups A & B, but no change in the HADS. Within-groups, improvements in the 6MWT and LCADL were likely to be clinically important in group A alone (Table 1).

Conclusion This study showed that a combination of NMES with LISLE resulted in largely similar improvements to LISLE alone. The addition of NMES may be more effective in improving activities of daily living and exercise tolerance but the cost of providing equipment and specialist staff for delivering this individualised home treatment must be weighed against the clinical benefits.

Changes in Primary and secondary outcome measures

All changes in outcome measures are explained below and recorded as shown below in Table 1.

Abstract S28 Table 1. Within –Group comparison (pre vs. post) and Between–Group Comparison (A vs. B) for primary and secondary outcome measures

Outcome	Group A				Group B				A vs. B	
	pre	post	median diff	P value	pre	post	median diff	P value	Asymp. (2 tailed sig)	
6MWT(m)	30 ± 119	74 ± 129	44	0.04*	27 ± 7.8	40 ± 22	13	0.04*	0.220	
SGRQ	73 ± 11	62 ± 17	11	0.04*	78 ± 10	67 ± 16	14	0.04*	0.75	
LCADL	52 ± 7.3	36 ± 11	12	0.04*	23 ± 24	22 ± 26	1	0.03*	0.01§	
HAD	14 ± 8.6	13 ± 6.2	1	0.18	14 ± 3.6	15 ± 3.8	1	0.46	0.08	

Data are presented as median ± SD unless otherwise indicated

pre = pre low intensity PR or NMES

post = post low intensity PR or NMES

* significant different from pre, significant difference between group A and B