Efficacy Marker	Baseline (off morphine)	Morphine	Placebo	P value (morphine v placebo)
Daytime cough frequency (c/hr)	22.97	6.26	20.94	<0.05
Night time cough frequency (c/hr)	4.84	0.71	4.17	<0.05
24 hour recording (c/hr)	17.94	5.25	17.00	<0.05
VAS Daytime (mm)*	47.68	16.32	43.52	<0.05
VAS night time (mm)	25.00	3.00	19.00	<0.05
CQLQ*	57.05	52.05	53.95	<0.05

Abstract S35 Figure 1 Median values for efficacy markers at baseline, on morphine and placebo *mean values.

scales (VAS)) and the cough quality of life questionnaire (CQLQ). For analysis we ran generalised estimating equations to compare morphine and placebo, adjusting for baseline measures and assessing any influence of treatment, sequence or period.

Results Low dose morphine reduced objective cough frequency compared to placebo by 71.8% over 24 hours. Morphine significantly reduced cough frequency overnight as well as during the daytime ($p < 0.05$) and responses were independent of baseline cough frequency. All patient reported outcomes were consistent with this effect ($p < 0.05$). The treatment effect was not significantly influenced by period or sequence. Overall morphine was well tolerated. There was one serious adverse event, unrelated to the study treatment.

Conclusions This is the first study to demonstrate a substantial objective reduction in cough frequency with low dose morphine in a clinically responsive group. Importantly this was accompanied by improvements in patient reported outcomes despite the short treatment duration used. The data suggests this population would be suitable for further investigation of the mode of action of opioids in chronic cough.

REFERENCE

1. Morice AH *et al.* Opiate therapy in chronic cough. *Am J Respir Crit Care Med* 2007;175(4):312–5.

S36 COUGH SUPPRESSION THERAPY IN SECONDARY CARE

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Introduction Non pharmacological cough suppression therapy (CST) delivered by speech and language therapists is one of the few effective treatments available for patients suffering from a chronic refractory cough (CRC) although its use is not currently widespread. CST is a relatively new and developing area, our understanding of its mechanisms and the optimal treatment strategies are limited. We currently have no way of predicting response to therapy.

Method Retrospective review of records from patients undergoing CST in the period 2014–2017. Objective measures included quality of life (QOL) measured using the Leicester cough questionnaire (LCQ) and Laryngeal symptoms (Newcastle Laryngeal Hypersensitivity Questionnaire, LHQ).

Results 198 predominantly female (73.2%) patients with chronic refractory cough underwent CST. Baseline/follow up LCQ and LHQ scores were available on 183/122 patients and 144/90 patients respectively. Most had a cough of >1 year duration (85.9%), impaired QOL (Baseline LCQ mean=11.6 (SD 3.52) and significant laryngeal symptoms (Baseline LHQ: mean 14.7 SD 3.08). The median number of CST sessions was 3. CST improved both QOL (Mean change in LCQ=4.97 SD 3.81) and laryngeal symptoms (Mean change in LHQ=3.13 SD 2.81). Most patients had a response greater than the minimally clinically important difference (MCID) for both LCQ (84.4%) and LHQ (64.4%) but a significant subgroup showed no improvement in objective markers or were worse after CST (15.6% LCQ, 34.4% LHQ). Sex, age, previous smoking status, duration of cough and baseline LHQ and LCQ did not predict non response to treatment.

Conclusions This is the largest series of patients undergoing CST published so far. Most patients show meaningful improvements in both symptoms and quality of life. Use of CST is not currently widespread and it is important that we improve access to this therapy. There is a significant subgroup of treatment non responders. Identifying those most likely to benefit will help us to personalise therapy for this challenging group of patients.

Hot topics in home-based mechanical ventilation

S37 HOME MECHANICAL VENTILATION (HMV) AND HOME OXYGEN THERAPY (HOT) FOLLOWING AN ACUTE EXACERBATION OF COPD IN PATIENTS WITH PERSISTENT HYPERCAPNIA: RESULTS OF THE PER PROTOCOL ANALYSIS FROM THE HOT-HMV UK TRIAL

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Introduction Intention-to-treat analysis from the HOT-HMV UK trial showed an improvement in admission-free survival with the addition of home mechanical ventilation (HMV) to home oxygen therapy (HOT) in patients with persistent hypercapnia following an acute exacerbation of COPD

Abstract S37 Figure 1 Kaplan-Meier plot showing survival from randomisation to end of trial follow up by treatment arm. Adjusted for number of COPD admissions in previous year, prior use of long term oxygen therapy (LTOT), age and BMI.

[JAMA;317:2177]. Delivery of HMV is essential and a per-protocol analysis was conducted to assess if patients who were adherent had better outcome.

Method Patients were randomised to HOT or HOT-HMV if they had persistent hypercapnia ($\text{PaCO}_2 > 7 \text{ kPa}$) 2 weeks following resolution of respiratory acidosis ($\text{pH} > 7.30$) secondary to an acute exacerbation of COPD. NIV was titrated to nocturnal hypoventilation and patients were followed up for 1 year. Patients allocated to the HOT arm that breached safety criteria had HMV added to HOT. Patients were included in the analysis in the HOT-HMV group if they had mean adherence of > 4 hours/night. Patients allocated to HOT were included up until trial withdrawal or treatment switching.

Results 57 patients were randomised to HOT-HMV of whom 15 were non-adherent and 11 had missing usage data and were treated as non-adherent. 59 patients were allocated to HOT of whom 5 patients were excluded due to treatment

switching. Median time to readmission or death was 1.1 months in the HOT group and 3.7 months in the HOT-HMV group (adjusted hazard ratio (HR) 0.41, 95% CI 0.23, 0.74, $p < 0.01$). All-cause mortality was reduced in the HOT-HMV group (figure 1; adjusted HR 0.36, 95% CI 0.13, 0.97, $p = 0.04$). There was a significant treatment effect on PaCO_2 at 6 weeks ($\Delta \text{pCO}_2 - 0.9 \text{ kPa}$, $p < 0.01$) which was observed at 12 months ($\text{pCO}_2 - 0.7 \text{ kPa}$, $p = 0.04$) with no significant effect on health related quality of life at 6 weeks (SRI $p = 0.28$, SGRQ $p = 0.98$) or 12 months (SRI $p = 0.71$, SGRQ $p = 0.31$).

Conclusion Patients with persistent hypercapnia following an acute exacerbation of COPD who were adherent to HOT-HMV had a reduced risk of readmission or death and in addition, unlike the intention to treat analysis, had an improvement in gas exchange and a reduction in all-cause mortality at 12 months. Addition of HMV to HOT should be considered for patients with persistent hypercapnia following a life-threatening exacerbation of COPD.

S38

HOME MECHANICAL VENTILATION (HMV) AND HOME OXYGEN THERAPY (HOT) FOLLOWING AN ACUTE EXACERBATION OF COPD IN PATIENTS WITH PERSISTENT HYPERCAPNIA: PREDICTING 1 YEAR ADMISSION-FREE SURVIVAL IN THE HOT-HMV UK TRIAL

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Introduction Data from the HOT-HMV UK trial showed an improvement in admission-free survival with the addition of home mechanical non-invasive ventilation (HMV) to home oxygen therapy (HOT) in patients with persistent hypercapnia following an acute exacerbation of COPD [JAMA;317:2177]. A *post-hoc* analysis was conducted to investigate (1) which baseline patient characteristics predict 12 month outcome and (2) the difference of these characteristics between treatment groups.

Abstract S38 Table 1 Comparison of baseline variables between patients with favourable (no readmission and alive at 12 months) to those with poor (readmission or death within 12 months)

	Home NIV and home oxygen			Home oxygen			Between treatment group comparison
	No admission/death (n=20)	Admission/death (n=37)	p-value	No admission/death (n=17)	Admission/death (n=42)	p-value	p-value
Age (mean (sd))	66.95 (9.67)	65.84 (10.50)	0.696	66.53 (9.42)	67.31 (8.97)	0.767	0.6242
FEV ₁ (mean (sd))	0.66 (0.24)	0.54 (0.20)	0.042	0.63 (0.30)	0.52 (0.19)	0.123	0.6784
ABG on air pCO ₂ (mean (sd))	7.72 (0.96)	7.94 (0.81)	0.358	7.88 (0.99)	7.88 (0.89)	0.992	0.4998
ABG on air pO ₂ (mean (sd))	6.49 (1.12)	6.40 (1.21)	0.788	6.31 (1.15)	6.41 (1.13)	0.764	0.6802
Weight (mean (sd))	61.24 (13.49)	60.84 (15.69)	0.925	69.28 (16.55)	60.20 (17.49)	0.072	0.2752
BMI (mean (sd))	22.23 (4.52)	22.27 (4.88)	0.974	25.09 (5.10)	21.79 (5.76)	0.044	0.1864
FFM (mean (sd))	32.09 (6.53)	30.05 (5.90)	0.266	31.20 (6.06)	29.95 (5.56)	0.482	0.8213
SRI-SS (mean (sd))	47.02 (15.16)	45.16 (15.07)	0.665	44.46 (17.08)	47.86 (15.09)	0.464	0.3996
SGRQ-SS (mean (sd))	68.84 (17.56)	73.55 (12.69)	0.259	71.09 (15.65)	68.22 (12.39)	0.467	0.1967
SGRQ-SX (mean (sd))	69.42 (18.45)	69.00 (16.87)	0.933	74.94 (15.45)	71.89 (16.81)	0.531	0.6762
SGRQ-AC (mean (sd))	85.20 (12.77)	92.02 (7.48)	0.015	88.14 (13.38)	84.96 (14.03)	0.438	0.0261
SGRQ-IM (mean (sd))	59.28 (23.14)	64.41 (18.93)	0.381	58.04 (20.49)	57.67 (16.62)	0.943	0.5342
MRC (mean (sd))	4.05 (1.18)	4.78 (0.48)	0.002	4.19 (0.98)	4.51 (0.78)	0.194	0.2314

ABG, arterial blood gas; BMI, body mass index; FEV₁, forced expiratory volume in 1 s; FFM, fat free mass; MRC, medical research council dyspnoea score; pCO₂, partial pressure of carbon dioxide in arterial blood; pO₂, partial pressure of oxygen with arterial blood; SRI-SS, severe respiratory insufficiency questionnaire summary score; SGRQ-SS, St George's respiratory questionnaire summary score.