Online Supplement

Research Letter: Pulmonary rehabilitation following hospitalisation for acute exacerbation of COPD - referrals, uptake and adherence.

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Inclusion and exclusion criteria for early post-hospitalisation pulmonary rehabilitation

Inclusion criteria:

- Admission for acute exacerbation of COPD, or pneumonia resulting in exacerbation of COPD;
- Functional and symptomatic impairment (typically MRC dyspnoea score 3 or above);
- Ability to mobilise 5 metres independently (with or without mobility aids);
- Motivated to undergo pulmonary rehabilitation

Exclusion criteria:

- Unstable cardiac disease precluding safe exercise;
- Unable to follow simple commands;
- Terminally unwell;
- Pulmonary rehabilitation within last 3 months

Patient Drop-Outs

90 patients were referred for early post-hospitalisation pulmonary rehabilitation with 43 eventually completing. Reasons for drop-out are outlined below:

Stages in pathway	**Reason for dropping out**
Failed to attend an initial assessment (n = 22)	No response to minimum 4 telephone calls or letter (n= 5) Declined initial assessment (n= 3) Did not attend at least 2 agreed assessment times (n= 10) Re-admitted to hospital (n= 3) Died (n= 1)
Non-starters of PR course (n = 8)	Cardiac issues requiring further investigations (n= 2) Re-admitted to hospital (n= 2) Transport issues (n= 4)
Non-completers of PR course (n = 17)	AECOPD (n= 7) Continued non-attendance - no reason (n= 7) Family illness (n= 1) Transport issues (n= 1) Failed to attend an end of course assessment (n= 1)

Pulmonary rehabilitation programme

The pulmonary rehabilitation (PR) programme comprised an 8-week multi-disciplinary outpatient programme, involving two supervised outpatient exercise and education classes per week. Patients were also asked to exercise at home for at least one other occasion per week. Each supervised class comprised 1 hour of exercise (mixture of aerobic and resistance training) and 1 hour on education with an emphasis upon self-management.

Outcome measurements

All measurements were carried out before and after the PR programme. Patients had exercise capacity assessed using the incremental shuttle walk (ISW) test. Further measurements included spirometry (at baseline only), health related quality of life (HRQL) questionnaires (Chronic Respiratory Disease (CRDQ),(1) COPD Assessment Test (CAT)(2) and the St Georges Respiratory Questionnaire (SGRQ)),(3) and the five-repetition sit-to-stand test (5STS).(4)

Response to early post hospitalisation pulmonary rehabilitation

Data from the 43 patients (28 male), that completed early post hospitalisation PR were analysed. Baseline characteristics, expressed as mean (SD), were age 74 (9) years, body mass index 26.9 (4.7) kg/m^2, FEV_1 percentage predicted 49 (22) %. The response to early post hospitalisation PR is shown below.

Outcome	Pre-PR	Post-PR	p-value
CAT	18 (7)	16 (7)	p = 0.03
CRQ – Dyspnoea	15 (10, 19)	21 (15, 28)	p < 0.01
CRQ – Fatigue	14 (5)	17 (5)	p < 0.01
CRQ – Emotion	32 (10)	37 (9)	p < 0.01
CRQ – Mastery	17 (5)	21 (5)	p < 0.01
ISW (m)	220 (130, 330)	260 (140, 380)	p < 0.01
5STS (secs)	15.3 (11.2, 20.9)	13.3 (10.4, 17.0)	p < 0.01
SGRQ Symptoms	61.5 (16.8)	57.2 (17.6)	p < 0.01
SGRQ Activities	62.3 (23.7)	61.1 (23.1)	p = 0.54
SGRQ Impact	33.0 (17.7)	27.7 (15.4)	p = 0.01
SGRQ Total	46.6 (16.4)	42.7 (15.5)	p = 0.02

Data expressed as mean (SD) or median (IQR). Groups compared using paired t tests or non-parametric equivalent. CAT, COPD Assessment Test; CRQ, Chronic Respiratory Disease Questionnaire; ISW, incremental shuttle walk; 5STS, five-repetition sit-to-stand test; SGRQ, St Georges Respiratory Questionnaire;

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