Specialist emergency care and COPD outcomes

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Aims

The Northumbria Specialist Emergency Care Hospital (NSECH) opened on 16 June 2015, introducing 24/7 specialty consultant on-call, direct transfer from the emergency department to specialty wards and 7-day consultant review. A respiratory support unit opened for non-invasive ventilation (NIV), with enhanced staffing ratios. Pre-NSECH the NIV service included mandated training and competency assessment, 24/7 single point of access, initiation of ventilation in the emergency department, a door-to-mask time target, early titration of pressures, and structured weaning. Pneumonia or hypercapnic coma complicating exacerbation of chronic obstructive pulmonary disease (COPD). is not considered a contraindication to NIV. Post-NSECH staff–patient ratios increased, the NIV pathway was streamlined and structured review introduced.

The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) 2015 enquiry and 2013 British Thoracic Society (BTS) NIV audit showed >34% of patients receiving acute NIV died.

We aimed to assess outcomes pre- and post-NSECH opening for our COPD population.

Methods

Patients hospitalised with an exacerbation of COPD (ECOPD) between 1 January 2013 and 31 December 2016 were identified using ICD10 J44 codes. Ventilation status was confirmed from rolling audit data, combined with a coding search (J96) and verification from patient records. Age, gender, admission from nursing home, consolidation, Charlson index, key comorbidities, length of stay and inpatient and 30-day mortality were captured. Population characteristics and outcomes were compared pre- and post-NSECH. Independent predictors of mortality were identified by logistic regression. Inpatient and 30-day mortality, adjusted for baseline performance and prognostic indices, was plotted (VLAD: variable life-adjusted display).

Results

6,291 patients were identified. Pre- and post-NSECH, demographic and clinical indices were similar. Among ventilated patients, 96.5% and 98% received NIV respectively. Inpatient plus 30-day mortality was lower post-NSECH for the whole cohort, and for ventilated and non-ventilated subgroups (Table 1). Independent predictors of mortality in a) the whole cohort were: NSECH (Beta=0.64; p=0.0001), age, admission from nursing home and Charlson Index; and b) in ventilated patients were: NSECH (Beta=0.51; p=0.0016), age and male gender. The VLAD plot showed sustained improvement in observed/expected mortality post-NSECH. Post-NSECH median length of stay fell by 1 day in both sub-groups.

Table 1. Summary of results

		Pre-NSECH	Post-NSECH	p-value
Inpatient mortality	All patients (%)	223/3943 (5.66)	90/2348 (3.83)	0.0012
	Ventilated (%)	71/540 (13.15)	32/346 (9.25)	0.086
	Not ventilated (%)	152/3403 (4.47)	58/2002 (2.90)	0.0035
Inpatient + 30-day combined mortality	All patients (%)	309/3943 (7.84)	123/2348 (5.24)	<0.0001
	Ventilated (%)	98/ 540 (18.15)	36/346 (10.40)	0.0015
	Not ventilated (%)	211/3403 (6.20)	87/2002 (4.35)	0.0037

NSECH = Northumbria Specialist Emergency Care Hospital

Conclusion

Introduction of 24/7 specialist emergency care was associated with a substantial fall in ECOPD mortality from strong baseline performance. Improved outcome was not limited to high-risk patients receiving ventilation. Furthermore, mortality day 0–30 post discharge also fell. ■

Conflict of interest statement

None.

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