Original Article

Standards of inpatient care during acute exacerbation of COPD in a tertiary care hospital, Karachi, Pakistan

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Objective: To evaluate the quality of care of patients with acute exacerbation of COPD in our tertiary care hospital and evaluate the change in practice after educational program and recommendations.

Methodology: An initial audit from 01/12/2013 to 31/11/2014 was carried out. Standard of care was determined with inpatient mortality, length of hospital stay, accuracy of initial controlled oxygen prescription, history and clinical assessment at admission, adherence of post graduate trainees to GOLD guidelines and discharge recommendations. A re-audit was performed in July 2015 with analysis of 6 months data.

Results: A total of the 121 files were included in first audit. Though the pattern in mortality remained the same, a significant reduction in median length of hospital stay from 11 to 7 to 8 days (p = 0.003) was observed. A significant improvement was seen in documentation of biomass exposure, renal failure, Anthonisen criteria, Performance status, systematic steroids, Anticoagulation (heparin), PEFR before discharge, Inhaler technique, Smoking cessation advice, vaccination advice, outpatient follow-up and oral steroid in re-audit phase of the study. Consistent practice was observed with regards to good inpatient prescription of oxygen therapy, systemic steroids and antibiotics.

Conclusion: Improvement in quality of care for AECOPD can be achieved with continuous education and monitoring of postgraduate doctors, a more systemic approach to patients, adherence to standard guidelines and intermittent audits.

Keywords: Chronic obstructive pulmonary disease, acute exacerbation of COPD, inpatient care.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a major health-care concern. It is characterized by persistent airflow limitation and respiratory symptoms.[3,4] COPD prevalence in Karachi was reported to be 13.8% in 2014, which must have increased with time due to environmental pollution, poverty and low customary of living in population of over 20 million in the city.[5] Acute exacerbation of COPD (AECOPD) is defined as "an acute worsening of patient's condition commencing the stable state, which is unremitting and may warrant the patient to seek additional treatment" which in turn increases morbidity, mortality and socioeconomic burden and heavy financial cost due to hospitalization and intensive care.[6]

Several national and international Thoracic Bodies, Global Initiative for Obstructive Lung Disease (GOLD), British Thoracic Society (BTS), European Respiratory Society (ERS) have produced management guidelines and are designed to improve standard of care, but little are followed.[1,7,8] Audit measures current practice against a defined (desired) standard thus becomes possible to measure the quality of healthcare and to identify the areas with chances of improvement with periodic assessment. The aim of this study was to evaluate the assessment, management with adherence to GOLD guidelines in patients with AECOPD in our tertiary care hospital.

METHODOLOGY

This retrospective clinical audit was conducted at pulmonology unit of Jinnah Hospital and Postgraduate Center (JPMC) Karachi from 1st December 2013 to 30th November 2014.All consecutive patients presented to pulmonology unit JPMC with AECOPD were included. Based on the first audit results, new discharge card was formulated. After six months of implementation of changes, second audit was performed and data of admitted patient over six month was collected and compared by same team.

A self-designed Performa was used which were prepared in accordance with the GOLD standards. It comprised of 44 questions covering 5 major areas of care including personal data and background information, initial clinical assessment at admission, initial management at admission, inpatient management and treatment outcome and advice on discharge with 6, 13, 4, 8 and 13 questions in each component, respectively. All questions had binary response (yes/no).

Statistical Analysis: Data were analyzed on SPSS version 21. MacNemar's chi-square test was applied to compare compliance rate before and after intervention. Two tail $p \leq 0.05$ was taken as statistically significant.

RESULTS

A total of the 121 files were included in first audit cycle, with mean age of 62.3 years, of them 71.4% were males and 28.6% were females, compared to 60 patients in reaudit with mean age of 62.2 years, of them 61.5% were males and 38.5% were females (Table 1). In re-audit, there was significant improvement in documenting pack year history, biomass exposure, Anthonisen criteria and performance status (MMRC scale). Sputum volume was 29.8% and 82.7% ($p < 0.05$), sputum purulence was 44.0% and 82.7% ($p < 0.05$) while audit and during reaudit, respectively.

Documentation rate increased for Nebulized Bronchodilator, Antibiotics, Inspired oxygen, Repeat Abgs, Assisted ventilation (NIPPV), BiPAP Performa but there was no significant difference in at initial and final audit. A significant increase was only observed for systematic steroids and Anticoagulation (heparin) (Table 2).

Inpatient mortality was 27.6% compared to international figures for inpatient mortality for AECOPD that is 9% (Fig. 1), with median length of inpatient stay (LOS) of 11 days (range 1 to 30 including LAMA). Mortality and DC compared to 4.5 to 8.8 days in other parts of world. Patients who died had diagnosis of Type I failure in 23.8% and had Type II failure 76.2%.

Discharge card was most neglected area during first audit. Significant improvements were noted after formulating dedicated COPD separate Discharge card. Baseline mobility was rarely assessed before discharge but a significant improvement was seen in re-audit (Table 3).

Table 1: Demographics and indices of disease severity at admission.

Variable	Audit	Reaudit	p-value
Age, mean (years)	62.3	62.2	–
Male sex	71.4	61.5	–
Female sex	28.6	38.5	–
Occupation documented	69	80.8	–
Smoking status asked	97.6	92.3	–
Smokers	78.6	67.3	–
Pack year history, median (IQR)	22.50 (5 – 150)	40.52 (5 – 150)	< 0.05
Biomass exposure	47.6	73.100	< 0.05
Type I RF	22.5	40.4	–
Type II RF	77.5	59.6	–
Anthonisen criteria	23.8	78.8	< 0.05
Comorbidities	78.6	84.6	–
Previous ER visits	46.4	48.1	–
Performance status (MMRC Scale)	42.9	73.1 (p 0.001)	< 0.05
Initial Clinical Assessment			
BP, R/R and HR	88	90.4	–
Baseline saturation at admission	48.8	76.9	–
Peak flow measurement (Baseline)	22.6	36.5	–
Chest X-Ray	65.5	67.3	

Data is presented as (%), IQR = Inter-quartile range, RF = Respiratory failure

Table 2: Inpatient management.

Variable	Audit	Reaudit	p-value
Nebulized Bronchodilators	100	98.1	–
systematic steroids	94	78.8	< 0.05
Antibiotics	94	92.3	–
Inspired oxygen	85.7	76.9	–
Repeat Abgs	0	52.4	–
Assisted ventilation (NIPPV)	89.6	90.3	–
BiPAP Performa	0	61.3	–
Anticoagulation (heparin)	15.5	40.38	< 0.05

Data is presented as (%), IQR = Inter-quartile range, RF = Respiratory failure

Table 3: Advice on discharge.

Variable	Audit	Reaudit	p-value
PEFR before discharge	35.8	66.7	< 0.05
Inhaler technique	0	63.6	< 0.05
Smoking cessation advice given	0	66.7	< 0.05
Vaccination advice given	20.2	66.7	< 0.05
Outpatient follow-up	34.5	78.8	< 0.05
Discharge Medication			
Inhaled Steroids with LABA	47.9	63.6	
Oral steroid	62.7	36.4	<0.05
Theophylline	64.2	60.6	–
Oral Antibiotics	88.2	68.8	–
LTOT advised	71.4	87.1	–

Data is presented as (%), PEFR: Peak expiratory flow rate, LABA: Long acting beta agonist, LTOT: Long term oxygen therapy

DISCUSSION

This clinical audit on standards of inpatient care during AECOPD has demonstrated significant deficiencies in current practice against standard of care that is GOLD guidelines.[9] Adherence to the GOLD statements leads to lower patient experience of all COPD-related symptoms and reduces the in-patient mortality, all-cause hospitalization and emergency department visits.[10]

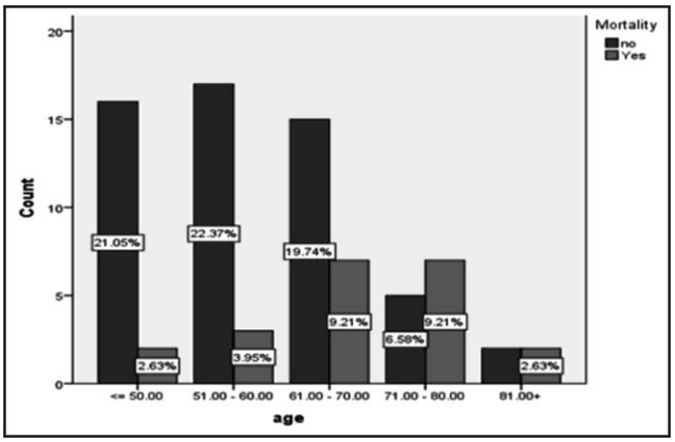


Fig. 1: Mortality association with age.

In the USA, it has been reported that only 33% of hospitalized patients with COPD receive guidelines-specified care.[11] Our aim for this audit was to make improvement in the current service and it was never intended to cause confrontation or blame. Adherence to GOLD guidelines were assessed with, accuracy of diagnosis of AECOPD, Initial assessment of severity of disease, inpatient treatment including formal O2 prescription, discharge criteria.

Anthonisen criteria was one neglected area in our files and was documented in 23.8% which improved to 78.8% ($p < 0.05$). A large COPD clinical audit has reported that relevant entries were missing in two third of such case.[12] Disease and exacerbation severity and treatment-related factors were more strongly associated with a longer LOS than the median, and of those, the biggest impact was noted with GOLD classification IV. This finding is in keeping with previous reports.[13] A history of previous admissions was also associated with longer LOS. This effect may be due to disease severity but is also likely to be impacted by psychosocial factors. Certainly, an association between LOS, depression and early readmission has been reported.[12] Median length of inpatient stay in our setup was 11 days (LAMA, Mortality and DC) reduced to 7.8days comparable to international figures of 4.5 to 8.8 days.[12]

The highest percent of inpatient mortality (28.8%) compared to 2 – 9% of international figures of inpatient mortality of AECOPD.[14] The reasons could be small number of cases, and also reported comorbidities. There are a number of investigations recommended to assist in the immediate management on admissions with AECOPD. These include baseline arterial blood gas analysis, chest radiograph, and baseline peak flow measurement.[15] These were documented in 78.8%,

67.3%, and 36.5% of cases, respectively. While inpatient treatment given for COPD exacerbation showed quite good agreement to GOLD guidelines.

Discharge card was noted to be most neglected area in first audit but significant improvement has noticed in all components including PEFR, vaccination advice, smoking cessation and inhaler techniques. Long-term oxygen therapy and smoking cessation are proven interventions that may extend life expectancy in patients with COPD.[16,17] Outpatient follow-up too improved to more than three fourth of case. Areas that further need to improve include advice on nutritional intake, physical activity and DC other than usual COPD care, like patients with TB and COPD together.

CONCLUSION

Audits are necessary to address the insufficiencies in health care system and play an essential role in improving the quality of care of patients as well as for better education of postgraduate doctors. Clinical audits should be done periodically in all hospitals across the country. This will create a more systemic approach to patients and adherence to standard care. A standardize medical record management system across Pakistan can help in performing annual clinical audits and improvement of patient care.

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