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Enhancing COPD management through a structured follow-up checklist to reduce exacerbations

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Abstract

Background: Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory condition marked by exacerbations that increase morbidity, mortality, and healthcare costs. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2023 guidelines introduced a follow-up checklist to optimize patient management and reduce exacerbations.

Objective: This study evaluates the efficacy of a COPD follow-up checklist in reducing exacerbation rates and improving patient outcomes through targeted interventions.

Methods: A prospective study was conducted at a Tertiary care hospital's Respiratory Medicine OPD from February 15, 2023, to July 15, 2023, involving 30 COPD patients. Data were collected using the GOLD 2023 follow-up checklist during in-person visits, with a subsequent 3-month follow-up to assess exacerbations and symptom changes. Parameters included mMRC grades, CAT scores, GOLD ABE categories, inhalation therapy, and self-management behaviors.

Results: The cohort (93.3% male, mean age 55 years) showed significant improvements after 3 months: mMRC grade 2 reduced from 17 to 15 patients, CAT scores >10 decreased from 30 to 21, and GOLD category A patients increased from 0 to 9. No exacerbations were reported during follow-up. Smoking cessation rates improved (11 to 18 patients), and medication adherence rose from 9 to 20 patients.

Conclusion: The COPD follow-up checklist effectively reduces exacerbations and enhances symptom control through structured monitoring and interventions. Its adaptability for in-person, phone, or virtual follow-ups supports broader implementation in clinical practice

Keywords: COPD; Exacerbations; Follow-up checklist; GOLD 2023; Self-management; Inhalation therapy

1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a heterogeneous, progressive lung condition characterized by chronic respiratory symptoms such as dyspnea, cough, sputum production, and emphysema, resulting from airway (bronchitis, bronchiolitis) and/or alveolar (emphysema) abnormalities causing persistent airflow obstruction. Exacerbations, defined as acute worsening of symptoms, are a leading cause of morbidity, mortality, and hospital readmissions, significantly impacting patients' quality of life and healthcare systems. Risk factors for exacerbations, including smoking, poor medication adherence, and inadequate inhalation techniques, are often modifiable through targeted interventions.

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The Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2023 guidelines introduced a structured follow-up checklist to standardize patient monitoring and optimize management. This checklist, applicable in in-person, phone, or virtual settings, assesses key parameters such as symptom severity (mMRC and CAT scores), exacerbation history, pharmacological and non-pharmacological therapies, and self-management behaviors. By addressing these factors, the checklist aims to reduce exacerbation rates and hospital re-admissions while improving patient outcomes.

This study investigates the utility of the COPD follow-up checklist in a cohort of 30 patients at a Tertiary care hospital, focusing on its impact on exacerbation rates, symptom control, and adherence to self-management strategies. The objectives were to assess the checklist's effectiveness, evaluate its components (e.g., self-management, risk-factor modification, pulmonary rehabilitation, and pharmacological strategies), and categorize patients per GOLD 2023 guidelines.

2. Material and methods

2.1. Study Design and Population

A prospective study was conducted at the Respiratory Medicine Outpatient Department (OPD) of a Tertiary care hospital from February 15, 2023, to July 15, 2023. The first 30 COPD patients attending follow-up visits were enrolled. Patients with a confirmed COPD diagnosis were included, while those attending their first visit were excluded to ensure prior treatment exposure.

2.2. Data Collection

Data were collected using the GOLD 2023 COPD follow-up checklist during in-person visits. The checklist evaluated:

- Symptom severity: mMRC dyspnea scale and COPD Assessment Test (CAT) scores.
- Exacerbation history: Recent hospital admissions and symptom changes.
- GOLD ABE classification: Based on mMRC, CAT, and exacerbation history.
- Pharmacological therapy: Inhalation therapies (e.g., LABA, LAMA, ICS, SABA).
- Non-pharmacological interventions: Use of CPAP, BiPAP, or long-term oxygen therapy (LTOT).
- Self-management behaviors: Smoking status, medication adherence, breathing control, stress management, and physical activity.
- Other factors: COVID-19 status and use of written action plans.

Patients were followed for an additional 3 months (until October 15, 2023) to monitor exacerbations and reassess checklist parameters. Interventions included counseling for smoking cessation, proper inhalation techniques, and pulmonary rehabilitation.

2.3. Statistical Analysis

Descriptive statistics summarized patient demographics, checklist parameters, and changes over time. Categorical variables (e.g., mMRC grades, GOLD categories) were reported as frequencies and percentages, while continuous variables (e.g., age) were expressed as means. Comparative analysis of baseline and 3-month follow-up data assessed improvements in symptom scores, adherence, and exacerbation rates.

3. Results

3.1. Patient Characteristics

Of the 30 patients, 28 (93.3%) were male, and 2 (6.7%) were female, with a mean age of 55 years (range: 30–87 years). The majority (30%) were aged 40–50 years.

3.2. Baseline Checklist Parameters

- **mMRC Grades**: 17 patients had grade 2, and 13 had grade 3.
- **CAT Scores**: All 30 patients had scores >10, indicating significant symptom burden.
- **GOLD Categories**: 25 patients were in category B, 5 in category E, and none in category A.
- **Symptoms**: Daily sputum production and cough were present in 15 and 13 patients, respectively. Recent symptom changes were noted in 17 patients (7 with increased symptoms, 10 with decreased symptoms).

- **Inhalation Therapy**: 22 patients used LABA+LAMA, 3 used LABA+LAMA+ICS, 2 used LAMA, 1 used LABA+ICS, and 1 used SABA.
- **Non-Pharmacological Therapy**: One patient used CPAP; none used BiPAP or LTOT.
- **Self-Management**: 11 patients maintained a smoke-free environment, 9 were medication-compliant, 21 practiced breathing control, 7 followed stress management, and 14 engaged in physical activity.
- **Exacerbation Management**: 16 patients had strategies for exacerbation prevention.
- **COVID-19**: No patients tested positive.
- **Written Action Plan**: None used a plan at baseline; all received one during the study.

3.3. Follow-Up Outcomes (3 Months)

- **mMRC Grades**: Grade 2 decreased to 15 patients, grade 3 to 6, and 9 patients improved to grade 1.
- **CAT Scores**: 9 patients achieved scores <10, while 21 remained >10.
- **GOLD Categories**: 9 patients shifted to category A, 16 remained in category B, and 5 in category E.
- **Symptoms**: Daily sputum production and cough reduced to 7 and 6 patients, respectively.
- **Inhalation Therapy**: LABA+LAMA users decreased to 16, LABA+LAMA+ICS increased to 5, LAMA increased to 9, and LABA+ICS and SABA use dropped to 0.
- **Self-Management**: Smoke-free environments increased to 18 patients, medication adherence to 20, breathing control to 25, stress management to 13, and physical activity to 21.
- **Exacerbations**: No exacerbations were reported during the 3-month follow-up.

3.4. Interventions

Counseling addressed smoking cessation, inhalation techniques, and medication adherence. Pulmonary rehabilitation was recommended, and proper inhalation therapies were optimized based on checklist findings.

4. Discussion

This study demonstrates the efficacy of the GOLD 2023 COPD follow-up checklist in reducing exacerbation rates and improving patient outcomes. The absence of exacerbations during the 3-month follow-up period highlights the checklist's role in proactive management. Key improvements included reduced mMRC grades, lower CAT scores, and a shift toward less severe GOLD categories (e.g., 9 patients reaching category A). These findings align with prior research emphasizing structured follow-up in COPD management (Agustí et al., 2023[1]; Miravitlles et al., 2017 [2]).

The checklist's comprehensive approach—encompassing symptom assessment, pharmacological optimization, and self-management—addressed critical risk factors. For instance, smoking cessation rates improved from 11 to 18 patients, reflecting successful counseling interventions. Medication adherence rose significantly (9 to 20 patients), likely due to education on inhalation techniques and written action plans. These results corroborate studies showing that adherence and proper inhaler use reduce exacerbation risk (Bourbeau et al., 2019[3]).

The predominance of male patients (93.3%) and the 40–50 age group aligns with regional COPD demographics, where smoking prevalence is higher among men. The high baseline CAT scores (>10 in all patients) indicate significant symptom burden, which improved post-intervention, suggesting the checklist's utility in tracking and mitigating symptoms. The shift in inhalation therapy (e.g., increased LAMA use) reflects tailored pharmacological adjustments based on checklist data, consistent with GOLD 2023 recommendations for individualized therapy (Halpin et al., 2021[4]).

Limitations include the small sample size (n=30), which may limit generalizability, and the short follow-up duration, which may not capture long-term outcomes. The single-center setting and lack of a control group further constrain the study's scope. Future research should involve larger, multicenter trials with control groups to validate the checklist's efficacy across diverse populations. Additionally, exploring its implementation in phone or virtual follow-ups could enhance accessibility, particularly in resource-limited settings.

The checklist's adaptability for non-in-person settings is a significant strength, as tele health has become integral to chronic disease management post-COVID-19 (Celli et al., 2022[5]). Its structured format ensures consistent data collection, enabling clinicians to identify and address risk factors promptly. By integrating self-management education, the checklist empowers patients, fostering behaviors that reduce exacerbation risk (Effing et al., 2016[6]).

5. Conclusion

The GOLD 2023 COPD follow-up checklist is a valuable tool for reducing exacerbations and optimizing patient outcomes. By systematically assessing symptoms, therapies, and self-management behaviors, it facilitates targeted interventions that improve symptom control, enhance adherence, and promote healthier lifestyles. The absence of exacerbations and significant improvements in mMRC, CAT, and GOLD categories underscore its clinical utility. Its flexibility for in-person, phone, or virtual use supports widespread adoption, particularly in diverse healthcare settings. Future studies should explore its long-term impact and scalability to further refine COPD management strategies. This checklist represents a practical, evidence-based approach to enhancing COPD care, aligning with global efforts to reduce the burden of this debilitating disease.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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