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Prescribing Pattern of Drugs in the Management of Chronic Obstructive Pulmonary Disease at an Indian Tertiary Care Teaching Hospital

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ABSTRACT

Aim: The main aim of this study is to evaluate the prescribing pattern of drugs in the management of Chronic Obstructive Pulmonary Disease (COPD).

Materials and Methods: Patients of both the genders with an age of above 18 years who were diagnosed with COPD were included in this study. Non-smokers, ex-smokers with smoking history of <10 pack years and patients with inflammatory diseases other than COPD were excluded from this study.

Results: Among the 110 study participants, 87.3% were males and 12.7% were females. It was observed that majority of the patients were in the age group 51-60 years (43.6%). Bronchodilators (34.6%) were mostly prescribed class of drugs, followed by antibiotics (27.3%) and corticosteroids (18.2%). β- lactam antibiotics were mostly prescribed which includes ceftriaxone (19.6%), amoxicillin (18.3%) and cefixime (13.3%). Inhaled corticosteroids were highly preferred which includes fluticasone propionate (52.9%) and budesonide (28.2%).

Conclusion: Proper pharmacological approaches help to improve the patients' quality of life in COPD. Hence, Clinical Pharmacists should take the responsibility in providing effective pharmaceutical care in case of these patients.

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a progressive life-threatening lung disease, which impacts high health care cost and increases the burden in terms of disability and impaired quality of life [1]. It has been a major cause of death and the prevalence rate is 10.1% worldwide. In India, the prevalence rate of COPD is 5% in males and 3.2% in females over the age of 35 years [2]. Patients who got affected with COPD may experience with the symptoms like shortness of breath, coughing, chest tightness and the daily activities becomes very difficult as the condition gradually worsens [3]. Smoking is the main cause of declined lung function as well as inflammation in most of the COPD patients; either they may be current smokers or former smokers.

However, the presence of co-morbidities such as hypertension, diabetes mellitus and anemia like chronic conditions in COPD patients flare-ups the severity and exacerbations that reduces the probability of health restoration and decreases the quality of life. The pharmacological treatment options are directed to aiding the airways to keep them open with mucus clearance and by reducing the inflammation [4]. In general, therapy can be started with either a Long Acting Muscarinic Antagonist (LAMA) or Long Acting β2 Agonist (LABA) or combination of these two (LABA/LAMA) as it affects on both breathlessness and exacerbations. Patients with more frequent exacerbations can be prescribed with Long Acting β2 Agonist with Inhaled Corticosteroids (LABA/ICS). In addition, the improper prescribing of drugs may cause severe adverse effects which may cause harm to the patient [5]. Hence, in this study we made an attempt to evaluate the prescribing pattern of drugs in the management of chronic obstructive pulmonary disease at an Indian tertiary care teaching hospital.

Materials and Methods

This was a prospective observational study conducted for a period of 6 months in the inpatient department of Respiratory Medicine at GSL General Hospital, Rajahmundry. A total of 110 patients of both the genders with an age of above 18 years who were diagnosed with COPD were included in the study. Non-smokers, ex-smokers with smoking history of <10 pack years and patients with inflammatory diseases other than COPD were excluded from this study [4]. Patient data was collected from a previously designed data collection form.

Results

In this study, a total of 110 patients were included. Among them 96 (87.3%) were males and 14 (12.7%) were females. Table 1 represents the age wise categorization of the patients included in the study. About 5.5% of the patients were in the age group 21-30 years, 11.8% were in the age group 31-40 years, 24.5%

of the patients were in the age group 41-50 years, 43.6% were in the age group 51-60 years and 14.6% were in the age group 61-70 years.

Table 1: Age wise categorization of the study participants

Age in years	Frequency (%)
21-30	6 (5.5)
31-40	13 (11.8)
41-50	27 (24.5)
51-60	48 (43.6)
61-70	16 (14.6)
Total	**110 (100)**

Out of 110 patients, 67 (60.9%) were current smokers and 43 (39.1%) were ex-smokers. It was also observed that cigarette smokers were found to be 76 (69.1%) and beedi smokers were 34 (30.9%). Table 2 represents the pattern of drugs prescribed in the management of COPD. Among the 110 prescriptions, a total of 1277 drugs were prescribed for the management of COPD. Among them, bronchodilators (34.6%) were the most prescribed class of drugs, followed by antibiotics (27.3%) and corticosteroids (18.2%). Leukotriene antagonists were the least prescribed class of drugs (5.4%).

Table 2: Pattern of drugs prescribed in the management of COPD

Class of Drugs	Frequency (%)
Bronchodilators	443 (34.6)
Antibiotics	348 (27.3)
Corticosteroids	231 (18.2)
Anti-histamines	98 (7.6)
Mucolytics	89 (6.9)
Leukotriene-antagonists	68 (5.4)
Total	**1277 (100)**

Table 3 represents the categorization of bronchodilators prescribed in the study. Acebrophylline was most frequently prescribed among bronchodilators with 29.5%, followed by formoterol 11.7%. Terbutaline 6.6% and Indacaterol 4.5% were the least prescribed bronchodilators in this study.

Table 3: Categorization of Bronchodilators prescribed in the study

Category	Drugs	Frequency (%)
Short acting β_2-agonists	Albuterol	39 (8.9)
	Levalbuterol	35 (7.9)
	Terbutaline	29 (6.6)
Long acting β_2-agonists	Formoterol	52 (11.7)
	Salmeterol	46 (10.3)
	Indacaterol	20 (4.5)
Methylxanthines	Acebrophylline	131(29.5)
Anti-Cholinergic	Ipratropium	49 (11.1)
	Tiotropium	42 (9.5)
Total		**443 (100)**

Table 4 represents the categorization of Antibiotics prescribed in this study. Among them, β-lactam antibiotics were the most commonly prescribed antibiotics which includes ceftriaxone (19.6%), amoxicillin (18.3%) and cefixime (13.3%).

Table 4: Categorization of Antibiotics prescribed in the study

Category	Drugs	Frequency (%)
β- lactam antibiotics	Amoxicillin	64 (18.3)
	Ceftriaxone	68 (19.6)
	Cefixime	46 (13.3)
Macrolides	Azithromycin	76 (21.9)
Aminoglycosides	Amikacin	43 (12.4)
	Gentamycin	26 (7.4)
Quinolones	Ciprofloxacin	14 (4.1)
	Levofloxacin	9 (2.5)
Oxazolidinone	Linezolid	2 (0.5)
Total		**348 (100)**

Table 5 represents the categorization of corticosteroids, in which inhaled corticosteroids were highly prescribed that includes fluticasone propionate (52.9%) and budesonide (28.2%). Hydrocortisone was the least prescribed systemic corticosteroid (1.3%) in this study.

Table 5: Categorization of corticosteroids prescribed in the study

Category	Drugs	Frequency (%)
Inhaled corticosteroids	Fluticasone propionate	122 (52.9)
	Budesonide	65 (28.2)
Systemic corticosteroids	Prednisone	23 (9.9)
	Dexamethasone	18 (7.7)
	Hydrocortisone	3 (1.3)
Total		**231 (100)**

Table 6 represents the combination of drugs prescribed among the COPD patients. Majority of the patients were given with salbutamol + Ipratropium (20.9%) followed by amoxicillin + clavulanic acid (19.1%) and Formoterol + Glycopyrronium (14.6%) in this study.

Table 6: Combination of drugs given among COPD patients

Combinations	Frequency (%)
Salbutamol + Ipratropium	23 (20.9)
Formoterol + Budesonide	14 (12.7)
Formoterol + Glycopyrronium	16 (14.6)
Salmeterol + Fluticasone	11 (9.9)
Amoxicillin + Clavulanic acid	21 (19.1)
Ceftriaxone + Sulbactam	9 (8.1)
Acebrophylline + Montelukast	10 (9.1)
Bromhexine + Guaifenesin	6 (5.6)
Total	**110 (100)**

Discussion

This was a prospective study conducted to evaluate the prescribing pattern of drugs in the management of chronic obstructive pulmonary disease. COPD is common in older adults and it intensifies gradually after several years [6]. Among the

110 study participants, 87.3% were males and 12.7% were females. It was observed that majority of the patients were in the age group 51-60 years (43.6%). This result was similar to the study done by Wig KL et al [7]. Smoking is the confounding factor which causes inflammation in COPD patients. It damages the air sacs, airways and lining of the lungs.

Bronchodilators (34.6%) were the most commonly prescribed class of drugs. This result was similar to the study conducted by Cazzola M et al [8]. Bronchodilators are most often prescribed in COPD patients to reduce hyper inflation and bronchial constriction. Acebrophylline was most frequently prescribed among bronchodilators with 29.5%, followed by formoterol 11.7%. Methylxanthines causes smooth muscle relaxation and improve breathing by increasing the strength of diaphragm.

Our study showed that, β- lactum antibiotics were mostly prescribed which includes ceftriaxone 19.6%, amoxicillin (18.3%) and cefixime (13.3%). Azithromycin (21.9%) was the second most prescribed antibiotic in the present study. This result was similar to the study conducted by Hogg J et al [9]. Use of antibiotics reduces the risk of exacerbation rate in COPD patients. Exacerbations may worsen the survival outcome of the COPD patients by decreasing the forced expiratory volume and forced vital capacity [10].

In our study, inhaled corticosteroids were highly preferred which includes fluticasone propionate (52.9%) and budesonide (28.2%). This result was similar to the study conducted by Price D et al [11]. Inhaled corticosteroids cause reduction in lung inflammation and decrease dyspnoea in COPD patients. Systemic side effects like hypertension and hyperglycaemia can be reduced by using inhaled corticosteroids. Combination therapies have a greater impact compared to monotherapy.

The most frequently prescribed drug combinations were salbutamol+Ipratropium (20.9%) followed by amoxicillin+clavulanic acid (19.1%) and Formoterol+ Glycopyrronium (14.6%) in this study.

Conclusion

In our study, bronchodilators were the most commonly prescribed drug class and Acebrophylline was the most frequently prescribed drug. Proper pharmacological approaches help to improve the patients' quality of life in COPD. Hence, Clinical Pharmacists should take the responsibility in providing effective pharmaceutical care in case of these patients.

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Conflicts of Interest

Nil

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None

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