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A STUDY ON PREVALENCE AND PRESCRIPTION PATTERN ANALYSIS IN PATIENTS WITH COPD ATTENDING THE PULMONARY DEPARTMENT IN A TERTIARY CARE HOSPITAL

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Abstract: The current study has been appropriately powered and structured to estimate the prevalence of COPD and other comorbidities as well as to examine the distribution of COPD medication prescriptions. The main objective of this study includes to determine the Demographic Characteristics, the Prevalence of COPD and its types, the distribution of COPD among Smokers and Non-Smokers, Evaluating the Clinical profile, Comorbidities Spirometric findings Radiographic profile (Chest- X-ray), and Prescription pattern of drugs in the COPD patients. This study was conducted in the pulmonology department for 6 months. The total no.of cases during the study registered in the pulmonology department was 1500. Among 1500, 200 patients were having COPD. Among 200, 149 (75%) were males and 51 (25%) were females. This study indicated that the prevalence of COPD was more in males than females. The prevalence of COPD was found to be 13.3%. According to our findings, the prevalence of COPD was higher than the global prevalence, which ranges from 10.7% to 12.1%. COPD was more in the age group of 61 to 70. The most common symptoms observed in the patients were dyspnea, cough, expectoration, wheezing, fever, and chest tightness. The most common comorbidity observed in patients were Hypertension, diabetes, chronic liver disease, hypothyroidism, obesity, and ischemic heart disease, etc. patients were treated with multiple drugs including beta-2 agonists, antimuscarinics, inhaled corticosteroids, phosphodiesterase inhibitors, leukotriene receptor antagonists, antihistamines, antibiotics, systemic corticosteroids, oxygen therapy, and other drugs. prescribed antibiotics include amoxicillin, piperacillin, azithromycin, ceftriaxone, levofloxacin, and doxycycline.

Index Terms **- COPD, prevalence, symptoms, comorbidities, prescription, patients, drugs.**

I. INTRODUCTION

A prevalent and curable illness known as chronic obstructive pulmonary disease (COPD) is characterised by tissue loss and a progressive restriction of airflow. It is connected to pathological changes in the lungs put on by inflammatory process by longterm exposure to harmful particles or gases, most often cigarette smoke. Airway constriction and a reduction in lung reflex are results of chronic inflammation. Dyspnoea, sputum production, and cough are common signs of the condition. From being asymptomatic to having respiratory failure, symptoms might vary. [1] Emphysema and chronic bronchitis are the two main kinds of COPD, but many people with the condition can have both. Cigarette smoke, second hand smoke, pollution fumes, genes, asthma are the main cause of COPD. Pulmonary function grading provides one indicator of COPD One grading system is a part of the GOLD classification, although there are other grading systems as well. COPD severity is assessed using the GOLD classification, which also aids in forming a prognosis and treatment strategy. Spirometry examination yields four GOLD grades. This test is based on findings of FEV1 spirometry test i.e., maximum volume of air that can be expelled from the lungs in the first second of an expiration. Your FEV1 drops as the severity rises. [5,6] Grade 1: Mild, Grade 2: Moderate, Grade 3: Severe, Grade 4: Very Severe. There is currently no cure for COPD, but with proper treatment, the symptoms can be managed and the progression of the disease can be slowed down. The treatment of COPD typically involves a combination of medications, lifestyle changes, and sometimes, oxygen therapy or surgery.[9,10] Many issues can arise from COPD, including: Infections of the lung, Heart issues, Lung tumours, Lung artery blood pressure, Depression.[11]

II. MATERIALS AND METHODS:

2.1 Study Site: This study was conducted on patients with COPD attending pulmonology ward in a tertiary care hospital.

2.2 Study Design: This study was a Prospective, Observational Study.

2.3 Study Duration: This Study was conducted for a period of 6 months, i.e., from Nov 2022 to Apr 2023, Period for collecting data – 5 months, Period for analyzing and reporting data – 1 month

2.4 Study Population : Sample was collected using convenient sampling technique. 100 patients were enrolled in this study

2.5 Study Criteria: The study will be carried out by considering the following criteria:

2.6 Inclusion Criteria: Patients of either gender, age greater than or equal to18 years, Patients with old or newly diagnosed with COPD, Patients who are willing to participate in this study, Patients with different comorbidities, Both inpatients and outpatients eligible.

2.7 Exclusion Criteria: Patients age below 18 years, Patients who are no willing to participate in this study, Pregnancy, lactating women

2.8 Data Collection And Assessment Of Study Observations : A valid and reliable patient specific data collection form was created to capture data from patients and from medical records. Profile form was created by student investigators after being validated through different standard publications. The data collection form include the information related to patient demographic details such as age, weight, sex, along with study specific details.

2.9 Statistical Analysis: The data were entered into Microsoft Excel Spreadsheet and Statistical analysis was performed by simple statistical methods to generate Frequencies, Percentages.

III. RESULTS AND STATISTICAL ANALYSIS :

The prevalent lung condition known as chronic obstructive pulmonary disease (COPD) limits airflow and impairs breathing. Chronic bronchitis or emphysema are other names for it. The lungs of those who have COPD may get harmed or clogged with mucus. 3.23 million people died from chronic obstructive pulmonary disease (COPD), the third largest cause of mortality worldwide in 2019. This study was conducted in pulmonology department for a period of 6 months. Around 1500 cases were registered in pulmonology department with multiple diseases. Prevalence of COPD was calculated. The prevalence of a particular attribute in a population over time is measured by its percentage. Total cases during the study registered in pulmonology department were 1500. Among 1500, 200 patients were having COPD. Prevalence of COPD in this study was calculated by using standard prevalence formula. The prevalence of COPD in this study was found to be 13.3%. According to our findings, the prevalence of COPD is higher than the global prevalence, which ranges from 10.7% to 12.1%.

3.1 Demographic Data :

3.1.1 Gender :

Table 3.1.1: Distribution According To Gender

Gender	No. Of Patients	Percentage (%)
Male	149	75
Female	51	25

3.1.2 Age :

Table 3.1.2: Distribution According To Age

Age	No. Of Patients	Percentage (%)
<30	4	2
31-40	32	16
41-50	38	19
51-60	57	29
61-70	66	33
>71	3	1.5

3.1.3 Area Of Residence:

Table 3.1.3: Distribution According To Area Of Residence And Gender

Area Of Residence	Male		Female	
	No.Of Patients	Percentage (%)	No.Of Patients	Percentage (%)
Urban	85	42	42	21
Rural	65	32	9	5

3.1.4 Education :

Table 3.1.4: Distribution According To Education And Gender

Education	Male		Female	
	No.Of Patients	Percentage (%)	No.Of Patients	Percentage (%)
Literate	72	36	38	19
Illiterate	77	38.5	13	6.5

3.1.5 Occupation :

Table 3.1.5: Distribution According To Occupation

Occupation	No. Of Patients	Percentage (%)
Employed	64	32
Self Employed	39	19.5
Farmer	24	12
House Wife	25	12.5
Retired	37	18.5
Not Working	11	5.5

3.2 COPD RELATED DATA :

3.2.1 Symptoms :

Table 3.2.1: Distribution According To Symptoms

Symptoms	No. Of Patients	Percentage (%)
Dyspnea	180	90
Cough	178	89
Expectoration	128	64
Wheeze	158	79
Fever	120	60
Chest Tightness	138	69

3.2.2 Systemic Findings :

Table 3.2.2: Distribution According To Systemic Findings

Systemic Findings	No. Of Patients	Percentage (%)
Rhonchi	140	70
Crepitation	120	60
Pedal Edema	69	34.5
Raised Jvp	56	28
Pallor	89	44.5
Cyanosis	49	24.5
Decreased Chest Movements	88	44

3.2.3 Comorbidities :

Table 3.2.3: Distribution According To Comorbidities

Comorbidities	No. Of Patients	Percentage (%)
Hypertension	70	35
Diabetes Mellitus	67	33.5
Obesity	45	22.5
Gall Stones	35	17.5
Cor Pulmonale	30	15
Ischemic Heart Diease	45	22.5
Hypothyrodism	55	27.5
Tuberculosis	22	11
Asthma	7	3.5
Chronic Liver Disease	58	29

3.2.4 Smoking Status :

Table 3.2.4: Distribution According To Smoking Status

Smoking	Status No. Of Patients	Percentage (%)
Smokers	170	85
Ex-Smokers	44	22
Current Smokers	126	63
Non Smokers	30	15

3.2.5 Alcohol Status :

Table 3.2.5: Distribution According To Alohol Status

Alcohol Status	No. Of Patients	Percentage (%)
Yes	128	64
No	72	36

3.2.6 Diagnostic Status :

Table 3.2.6: Diagnostic Status Of Copd

Diagnostic Status	No. Of Patients	Percentage (%)
Newly Diagnosed With Copd	40	20
Exacerbation Of Copd	160	80

3.2.7 Chest X Ray (Radiographic Profile) :

Table 3.2.7: Distribution According To Radiographic Profile

Radiographic Profile	No. Of Patients	Percentage (%)
Emphysema	130	65
Chronic Bronchitis	70	35
Cardiomegaly	15	7.5
Enlarged Pulmonary Artery	10	5
Increased Broncho Vascular Markings	12	6

3.2.8 Spirometric Evaluation (Gold Criteria) :

Table 3.2.8: Distribution According To Spirometric Evaluation (Gold Criteria)

Spirometric Evaluation (Gold Criteria)	No. Of Patients	Percentage (%)
Mild (Fev1 >=80)	42	21
Moderate (Fev1 50-79)	93	46.5
Severe (Fev1 30-49)	44	22
Very Severe (Fev1 < 30)	21	10.5

3.2.9 Echo Findings :

Table 3.2.9: Distribution According To Echo Findings

Echo Findings	No. Of Patients	Percentage (%)
Normal	128	64
Pulmonary Hypertension	40	20
Cor Pulmonale	30	15
Right Heart Failure	14	7
Left Ventricular Diastolic Dysfunction	16	8
Left Ventricular Hypertrophy	19	9.5
Left Ventricular Systolic Dysfunction	14	7

3.2.10 Total Number Of Drugs Prescribed :

Table 3.2.10: Distribution According To Total No Of Drugs

No Of Drugs	No. Of Patients	Percentage (%)
4	25	12.5
5	35	17.5
6	20	10
7	65	32.5
8	20	10
9	35	17.5

3.2.11 Category Of Drugs :

Table 3.2.11: Distribution According To Category Of Drugs

Category	No. Of Patients	Percentage (%)
Beta-2 Agonists	140	70
Antimuscarnics	120	60
Inhaled Corticosteriods	130	65
Phosphodiesterase Inhibitors	60	30
Leucotriene Receptor Antagonists	90	45
Antihistamines	80	40
Antibiotics	160	80
Systemic Corticosteriods	130	65
Oxygen Therapy	40	20
Others	140	70

3.2.12 Route Of Administration Of Drugs :

Table 3.2.12: Distribution According To Route Of Administration Of Drugs

Route Of Administration Of Drugs	No. Of Patients	Percentage (%)
Inhalational	170	85
Oral	130	65
Injections	60	30

3.2.13 Prescribing Pattern Of Drugs In Patients :

Table 3.2.13: Prescription Pattern Of Beta-2 Agonists

Beta-2 Agonists	No. Of Patients	Percentage (%)
Formoterol	60	30
Salbutamol	40	20
Terbutaline	40	20

Table 3.2.14: Prescription Pattern Of Anti Muscarnics

Anti Muscarnics	No. Of Patients	Percentage (%)
Tiotropium	70	35
Ipratropium	50	25

Table 3.2.15: Prescription Pattern Of Inhaled Corticosteriods

Inhaled Corticosteriods	No. Of Patients	Percentage (%)
Budesonide	60	30
Fluticasone	70	35

Table 3.2.16: Prescription Pattern Of Phophodiesterase Inhibitors

Phophodiesterase Inhibitors	No. Of Patients	Percentage (%)
Acebrophylline	30	15
Theophylline	15	7.5
Doxophylline	15	7.5

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Table 3.2.17: Prescription Pattern Of Leucotriene Receptor Antagonist

Leucotriene Receptor Antagonist	No. Of Patients	Percentage (%)
Montelukast	90	45

Table 3.2.18: Prescription Pattern Of Antihistamine

Antihistamine	No. Of Patients	Percentage (%)
Levocetrizine	80	40

Table 3.2.19: Prescription Pattern Of Antibiotics

Antibiotics	No. Of Patients	Percentage (%)
Amoxicillin And Clavulanic Acid	70	35
Piperacillin+ Tazobactem	30	15
Azithromycin	40	20
Ceftriaxone	30	15
Levofloxacin	15	7.5
Doxycycline	15	7.5

Table 3.2.20: Prescription Pattern Of Systemic Corticosteriods

Systemic Corticosteriods	No. Of Patients	Percentage (%)
Methylprednisolone	40	20
Dexamethasone	30	15
Beclamethasone	30	15
Hydrocorticosone	30	15

Table 3.2.21: Prescription Pattern Of Other Drugs

Other Drugs	No. Of Patients	Percentage (%)
Bromhexine	50	25
Guiaphensine	20	10
Ambroxol	30	15
Pantoprazole	40	20
Ranitidine	30	15

IV. DISCUSSION :

The prevalence of a particular attribute in a population over time is measured by its percentage. Total cases during the study registered in pulmonology department were 1500. Among 1500, 200 patients were having COPD. - The prevalence of COPD in this study was found to be 13.3%. According to our findings, the prevalence of COPD is higher than the global prevalence, which ranges from 10.7% to 12.1%.

4.1 Demographics :

4.1.1 Gender - In this study, among the study population males are more than females, which indicates COPD was more prevalent in males followed by females.

4.1.2 Age - In this study, COPD patients was more in the age group 61 to 70, followed by 51-60, 41-50, 31-40, >71 and <30 age groups. The mean age of patients in this study is 55 yrs.

4.1.3 Area of residence - In this study, most of the patients were from urban area, followed by rural area, which indicates that COPD was more prevalent in urban area followed by area. Educational status - In this study, most of the patients are literates followed by illiterates, which indicated COPD was more prevalent in literate patients.

4.1.4 Occupational status - Among the study population, 32% were employed, 19.5% were self-employed, 12% were farmers, 18.5 % were retired, 5.5% were unemployed and 12.5% were housewife.

4.2 COPD Related Data :

4.2.1 Symptoms - The most common symptom observed in patients was dyspnea followed by cough, expectoration, wheeze, fever and chest tightness.

4.2.2 Systemic Findings - The most common systemic finding observed in patients was Rhonchi followed by crepitation, pedal oedema, raised JVP, pallor, cyanosis, and decreased chest movements.

4.2.3 Comorbidities - The most common comorbidity observed in patients was Hypertension followed by diabetes, chronic liver disease, hypothyroidism, obesity, ischemic heart disease etc.

4.2.4 Smoking Status - Smoking status was evaluated among the study population. 85% percent of the study population has smoking habit and 15 % were nonsmokers. This study indicated that COPD was more prevalent in patients with smoking habit.

4.2.5 Alcohol status - Alcohol status was evaluated among the study population. 64% percent of the study population has alcohol habit and 35 % were nondrinkers.

4.2.5 Diagnostic status - In this study, most of them were having previous history of COPD and is exacerbated now. Newly diagnosed patients were 20 % and exacerbated patients were 80%. Radiographic profile (Chest X ray) - In this study, chest X ray was performed to evaluate the diagnosis of patients. Chest X ray findings shows that 65% patients were having emphysema, 35% patients were having chronic bronchitis, 7.5% were having cardiomegaly, 5% patients were having enlarged pulmonary artery and 6% patients were having increased bronchovascular markings. This study indicated that Prevalence of Emphysema is more followed by chronic bronchitis.

4.2.6 Spirometric Evaluation (GOLD Criteria) - Spirometry (GOLD criteria) was used to assess the severity of the COPD among study population. Most of the patients were having Moderate COPD followed by Severe COPD, very severe COPD and Mild COPD. This study indicated that Moderate COPD is more prevalent among study population

4.2.7 ECHO findings - In this study, ECHO was performed to evaluate the diagnosis of COPD related problems. 64% patients were having normal echo findings. Remaining patients ECHO findings include pulmonary hypertension, corpulmonale, right heart failure, left ventricular diastolic dysfunction, left ventricular hypertrophy, left ventricular systolic dysfunction.

4.2.8 Total Number of drugs prescribed - In this study, patients were treated with multiple classes of drugs. Average number of drugs prescribed per prescription is 7. Most of the patients were prescribed with 7 drugs per prescription followed by 5 and 7 drugs per prescription, 4 drugs per prescription, 6 and 8 per prescription.

4.2.9 Category of drugs - I n this study, COPD patients were treated with multiple drugs. Classes of drugs include beta-2 agonists, antimuscarnics, inhaled corticosteroids, phosphodiesterase inhibitors, leukotriene receptor antagonists, antihistamines, antibiotics, systemic corticosteroids, oxygen therapy and other drugs.

4.2.10 Route of administration of drugs - In this study, COPD patients were treated with multiple drugs. Route of administration of drugs include inhalational, oral and injections. Inhalational is the most common route of administration

4.2.11 Prescribed drugs - In this study, prescribed beta-2 agonists include formoterol, salbutamol and terbutaline, prescribed antimuscarnics include tiotropium and ipratropium, prescribed inhaled corticosteroids include budesonide and fluticasone, prescribed phosphodiesterase inhibitors include acebrophylline, theophylline and doxophylline, prescribed leukotriene receptor antagonist include montelukast, prescribed antihistamine was levocetrizine, prescribed antibiotics include amoxicillin, piperacillin, azithromycin, ceftriaxone, levofloxacin and doxycycline, prescribed systemic corticosteroids includes methylprednisolone, dexamethasone, beclamethasone and hydrocortisone, other drugs prescribed includes bromhexine, guiaphensine, ambroxol, pantoprazole and ranitidine.

V. CONCLUSION :

Chronic airflow restriction that is progressive is a defining hallmark of chronic obstructive pulmonary disease (COPD). The inflammatory response in the airways is increased. Chronic obstructive pulmonary disease (COPD) is characterised by progressive lung function loss and respiratory symptoms, particularly dyspnea, coughing, and sputum production. The overall severity of each patient's condition is influenced by exacerbations and comorbidities. COPD is linked to a large economic impact, such as hospitalisation, missed employment, and disability. Since the most recent data indicate that COPD mortality is rising, all three characteristics of COPD are quite concerning. The prevalence of COPD in this study was found to be 13.3%. According to our findings, the prevalence of COPD is higher than the global prevalence, which ranges from 10.7% to 12.1%. The most frequent etiological cause for COPD was smoking (85%).

According to the results of the current study, the majority of patients were between the ages of 61 and 70, with a predominance of male patients, from urban area and common comorbidities was hypertension, diabetes, Dyspnoea, chronic cough, expectoration, dyspnoea are common symptoms. In this study, chest X ray was performed to evaluate the diagnosis of patients. Chest X-ray findings shows that 65% patients had emphysema, 35% patients had chronic bronchitis. The Prevalence of Emphysema is more followed by chronic bronchitis. Echocardiography aids in the early diagnosis of cardiac involvement, especially rightsided cardiac involvement in COPD patients. ECHO findings include pulmonary hypertension, corpulmonale, right heart failure, left ventricular diastolic dysfunction, left ventricular hypertrophy, left ventricular systolic dysfunction. The best parameter for diagnosing and determining the severity of the disease is spirometric evaluation (GOLD criteria) by measuring forced expiratory volume. The majority of the patients had moderate COPD, which was followed by severe, very severe, and mild COPD. In this study, patients were treated with multiple classes of drugs. Average number of drugs prescribed per prescription is 7. Classes of drugs include beta-2 agonists, antimuscarnics, inhaled corticosteroids, phosphodiesterase inhibitors, leukotriene receptor antagonists, antihistamines, antibiotics, systemic corticosteroids, oxygen therapy and other drugs. Finally, this research illuminates the clinical characteristics and prevalence of COPD patients. The results show that COPD is a common condition that significantly lowers the quality of life for those who suffer from it. The study emphasizes the value of early detection and intervention to enhance clinical outcomes and lessen the burden of this illness. The study also offers important insights on the clinical and demographic traits of COPD patients, which might help public health policies and programmes that aim to lower the prevalence and morbidity of this illness.

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