Research article   *Medical research*

A Study on Functional Status and Well Being in Obstructive Lung Diseases with Regard to Clinical Parameters and Symptoms – A Descriptive and Comparative Study.

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Published on: 3.04.2023

ABSTRACT

An observational and comparative study was conducted at a tertiary care teaching hospital, Telangana state, India. A total of 100 patients from the In-patient department of Pulmonology in Gleneagles Global Hospital, who were diagnosed with Asthma, Chronic obstructive pulmonary disease, bronchiectasis, and those who have fulfilled the exclusion and inclusion criteria were selected for the study. Data was collected from the patient case records and information gathered with the help of patients and their attenders during ward rounds with the support of a physician which were analysed by SPSS software. Moreover, daily follow-ups were conducted to assemble data on amendment in therapy, everyday prognosis information and approaches in treatment leading to betterment in case study. Out of 100 patients considered in the study, 61(61%) were male and 39(39%) were female, to the study, patients having age between 60-70 has shown the highest diseased state of obstructive lung disease, past medical history of Asthma leading to the main cause of developing obstructive lung diseases, highest symptom noticed was productive cough with sputum, nebulization therapy showing highest efficacy in treating patients with obstructive lung disease and the major diagnostic criteria used in diagnosing obstructive lung disease is chest X-ray and HRCT. Emphysema is more evident than chronic bronchitis in COPD, Airway hyperresponsiveness is more evident than bronchoconstriction in Asthma.

Keywords: Chronic obstructive pulmonary disease, Asthma, bronchiectasis, Clinical parameters, symptoms.

INTRODUCTION

A study was carried out to evaluate the clinical parameters and symptoms based on diagnosed disease such as Asthma, Chronic obstructive pulmonary disease, and bronchiectasis. Clinical parameters such as age, gender, comorbidities, sputum growth, various forms of dosage forms included, oxygen saturation, social habits, past medical history, post covid or not, mortality rate, lifestyle status, exposure conditions, genetics, symptoms, and treatment are considering. Literatures which support the study were collected and were reviewed for study on functional status and well-being of obstructive lung diseases. A standard data entry form for collecting patient's details was designed and during the ward rounds the entire patient data with special reference to the clinical parameters noted were recorded in the format.

Obstructive lung diseases, which include
- Chronic obstructive lung disease [COPD]
- Asthma
- Bronchiectasis
- Bronchiolitis
- Cystic fibrosis.

Chronic obstructive lung disease
Definition
Chronic obstructive pulmonary disease (COPD) is characterized by the chronic airflow limitation leading to pathological changes in the lung, characterised by persistent respiratory symptoms due to abnormality in the air ways caused by exposure to noxious particles and gases.
For the diagnostic and treatment approach, the global initiative for chronic obstructive lung disease (GOLD) was created in 2001.GOLD reports are effective evidence-based

medicine or tools for implementation of effective management plans and shows the current best practices for the care of patients with COPD.
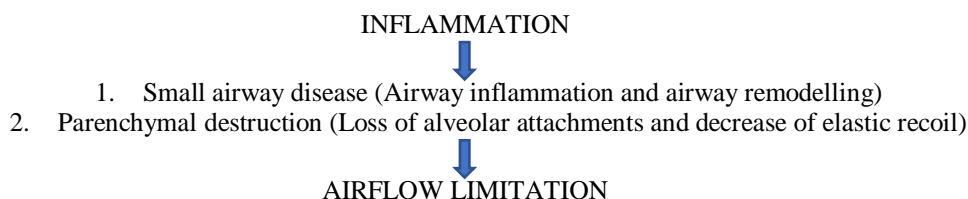
The goals of the GOLD organization are to increase awareness of COPD and decrease morbidity and mortality associated with the disease. International guidelines have been developed through a collaborative effort of the American college of physicians (ACP), the American college of chest physicians (ACCP), the American thoracic society (ATS), and the European respiratory society (ERS) and are widely available. In addition, the British guidelines were updated in 2010 all of these guidelines are generally consistent in their recommendations. Finally, ACCP and the Canadian thoracic society collaborated on a guideline focusing on the prevention of COPD exacerbations which was published in 2015.

COPD has two conditions:
1)Chronic bronchitis
2)Emphysema

Chronic airflow limitation in copd

INFLAMMATION

⬇

1. Small airway disease (Airway inflammation and airway remodelling)
2. Parenchymal destruction (Loss of alveolar attachments and decrease of elastic recoil)

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AIRFLOW LIMITATION

Asthma
Definition

- The word asthma is derived from Greek word (meaning: difficulty in breathing). Asthma's clinical expression varies from a mild wheeze or cough to severe obstruction which leads to restriction of normal activity. Asthma attacks are triggered due to various stimuli which includes allergen exposure, exposure to cold air, upper respiratory tract infections and exercise.
- The risk of developing asthma has also been increased due to number of genetic polymorphisms. Therefore, genetic factors also contribute to the exaggerated response of asthma.
- Status asthmaticus, is a life-threatening condition that needs to be treated aggressively and patient needs to be kept under observation.
- Status asthmaticus is unresponsive to standard therapy.
- When we breathe normally, muscles that are present around our airways are relaxed thereby allowing air to move easily and quietly.
- During an asthma attack, bronchospasm, inflammation and mucus production can happen.
- In bronchospasm, muscles around the airways tighten making the airways narrow. The constricted airways do not allow the air to flow freely.
- In inflammation, the lining of the airways become swollen making it difficult for the air to move in and out.
- More mucus is produced during an asthma attack. The thick mucus clogs airways.
- For the successful therapy of asthma, important outcomes include:
- Prevention of chronic and troublesome symptoms.
- Pulmonary function has to be maintained normally.
- To maintain normal activity levels.
- Recurrent exacerbations of asthma need to be prevented.
- Minimize the need for emergency visits to hospital.
- To provide pharmacotherapy with minimum adverse effects.

Bronchiectasis
Definition

Bronchiectasis is a condition where damage caused the tube in the lungs (airways) to widen or develop pouches., it makes it hard to clear mucus out of the lungs and can cause frequent infection.

Signs and symptoms

1) Shortness of breath (dyspnoea)
2) Wheezing
3) Coughing up blood(haemoptysis)
4) Bad-smelling mucus
5) Swollen fingertips with curved nails
6) Cough with lots of mucus and pus
7) Repeated colds
8) Extreme tiredness
9) Fever, chills
10) Increased shortness of breath
11) Night sweats

METHODOLOGY

STUDY SITE: In-patient of Pulmonology Department at Gleneagles Global Hospitals, Bairamalguda, LB Nagar, Hyderabad.

STUDY DESIGN: A hospital based concurrent observational study was carried out on 100 in-patients in general medicine wards.

SAMPLE SIZE: A total of 100 patients in-patients from the in-patient of pulmonology department in Gleneagles Global Hospital, who were diagnosed with different obstructive lung diseases such as COPD, Asthma, bronchiectasis and comparing the different clinical parameters and those who fulfilled the exclusion and inclusion criteria were selected for the study.

SAMPLE PERIOD: The study was carried out for a period of six months.

Study criteria
Inclusion criteria

- Patients aged between 10-80 years

- Patients with past medical history
- Smoking status
- Alcoholic status
- Patients willing to participate in the study

Exclusion criteria
- Out-patients
- Pregnant women
- Lactating female
- Coma patients

- Patients having insufficient data in their records

Sources of data
Patient demographic details (age, sex, social history),Chief complaints, History of Past medical illness, Family history, Final Diagnosis, Name of the drugs, Different dosage forms, Dosage regimen (form, dose, route, frequency, duration), Diagnostic criteria, Symptoms, Post covid or not, Lifestyle status, Hereditary, Mortality Rate, Exposure.

RESULTS

Table 1 : Gender Distribution of Study Population (N=100)

S.NO	GENDER	NO.OF PATIENTS	PERCENTAGE (%)
1	MALE	61	61 %
2	FEMALE	39	39 %
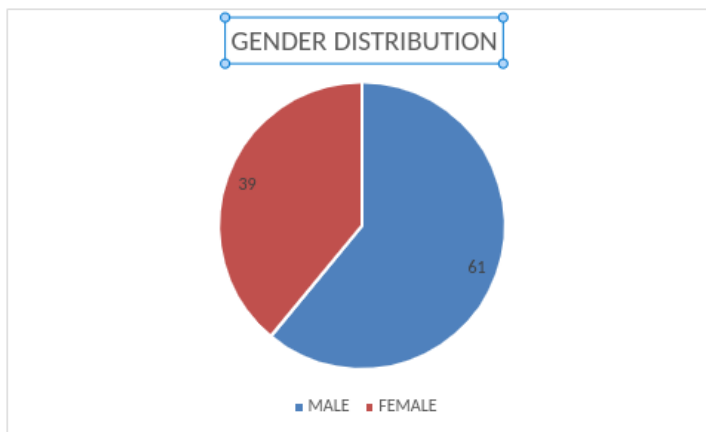
Fig 1: Gender Distribution

Table 2: Age Distribution of Study Population

S.NO	AGE IN YEARS	NO.OF PATIENTS	PERCENTAGE
1	< 20	8	8 %
2	21 - 30 YEARS	6	6 %
3	31 - 40 YEARS	11	11 %
4	41 - 50 YEARS	12	12 %
5	51 - 60 YEARS	21	21 %
6	61 - 70 YEARS	29	29 %
7	71- 80 YEARS	11	11 %
8	81 - 90 YEARS	2	2 %
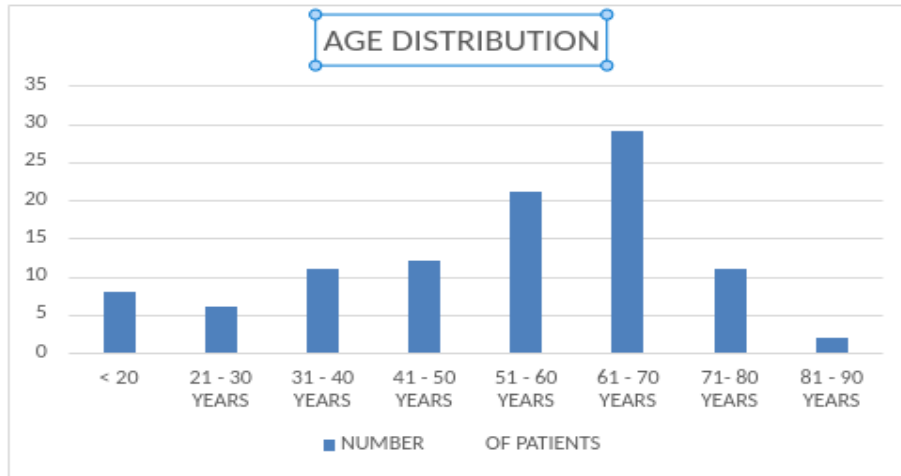
Fig 2: Age Distribution

Table 3: Smoking History of Patients

SMOKING STATUS	NO OF PATIENTS	%
SMOKER	66	0.66%
NON SMOKER	34	0.34%
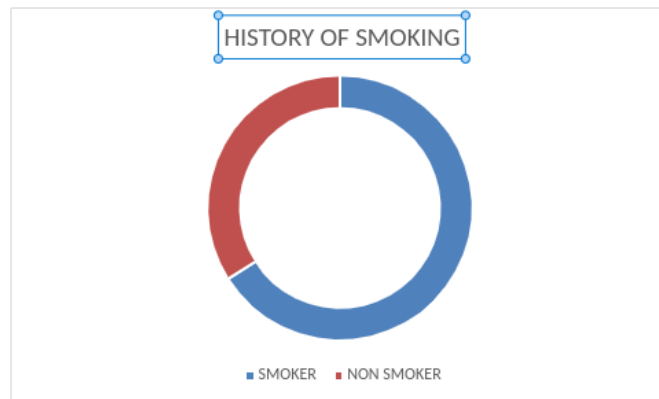
Fig 3: History of Smoking

Table 4: History of Alcohol Abuse in the Patients

ALCOHOL STATUS	NO OF PATIENTS	%
NON-ALCOHOLIC	61	61.00%
ALCOHOLIC	39	39.00%
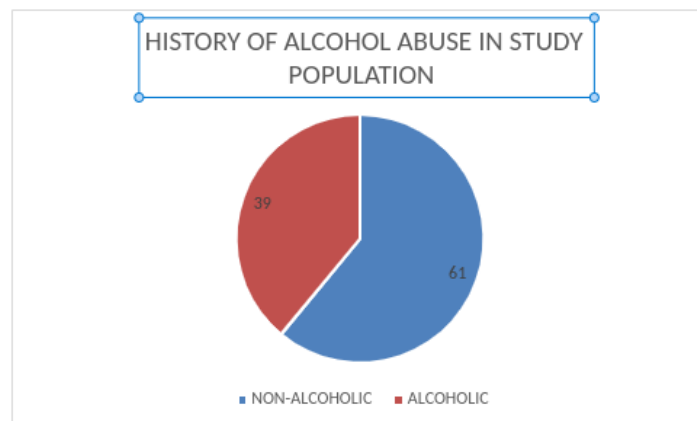
Fig 4: History of Alcohol abuse in study population
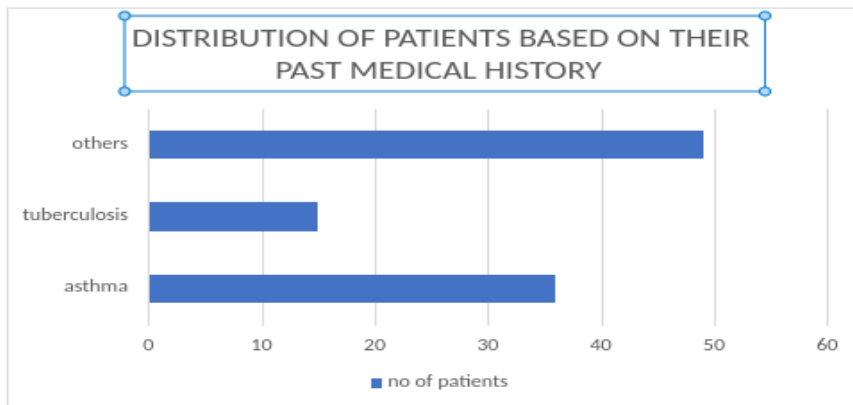
Table 5: Distribution Of Patients Based On Tobacco Consumption

TOBACCO STATUS	NO OF PATIENTS	%
CHEWING	20	20%
NOT CHEWING	80	80%
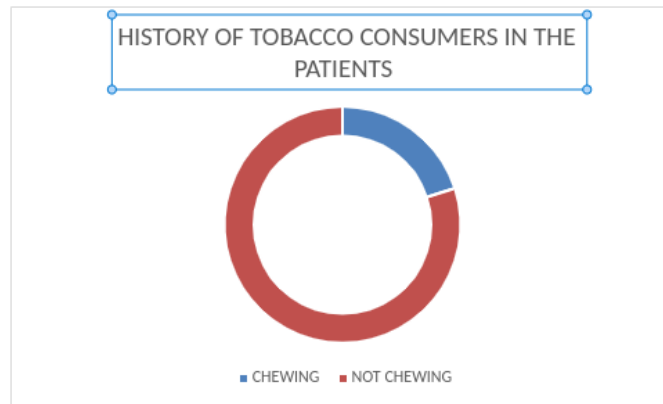
Fig 5: History of Tobacco consumers in the patients

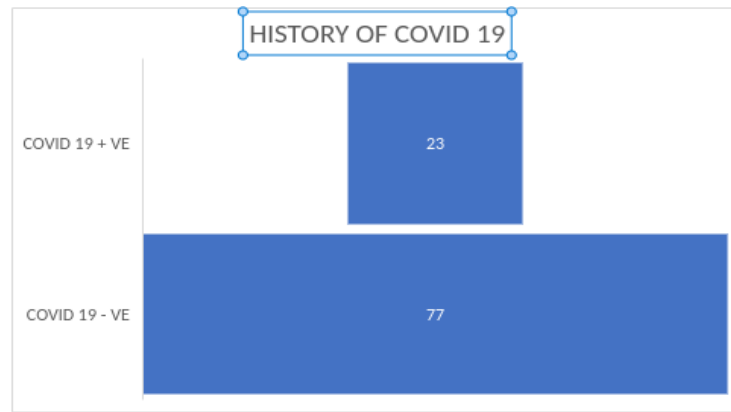**Table 6: Distribution of Patients Based on Their Past Medical History**

PAST MEDICAL HISTORY	NO OF PATIENTS	%
ASTHMA	36	36%
TUBERCULOSIS	15	15%
OTHERS	49	49%

Fig 6: Distribution of patients based on their past medical histroy

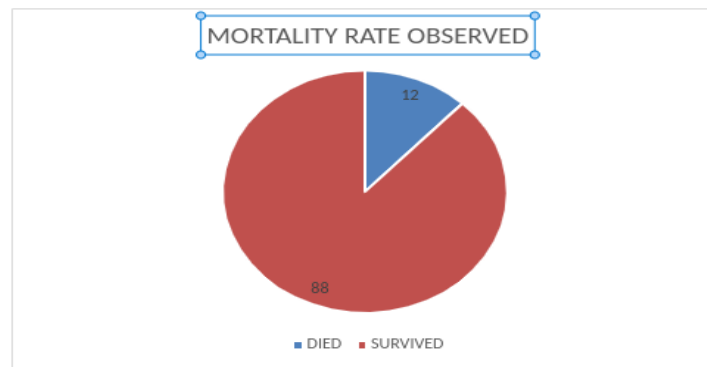**Table 7: Distribution Of Patients Based On Their Post Covid 19 Status**

POST COVID 19 STATUS	NO OF PATIENTS	%
COVID 19 + VE	23	23%
COVID 19 – VE	77	77%

Fig 7: History of Covid 19

Table 8: Mortality Rate Observed (N=100)
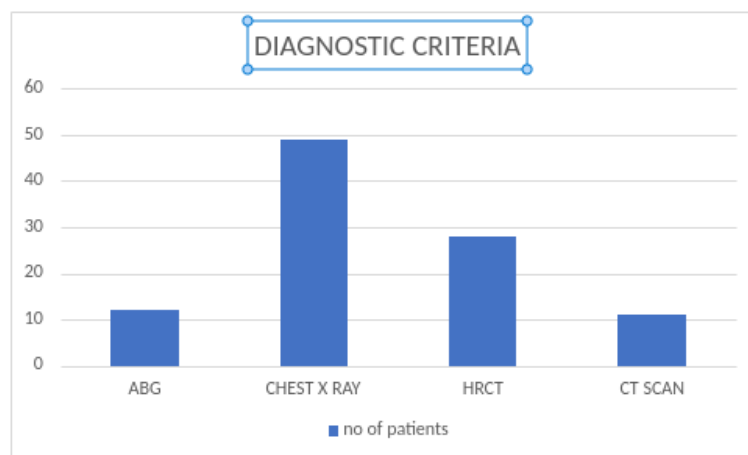
STATUS	NO OF PATIENTS	%
DIED	12	12%
SURVIVED	88	88%

Fig 8: Mortality rate observed

Table 9: Distribution Of Patients Based On Diagnostic Criteria
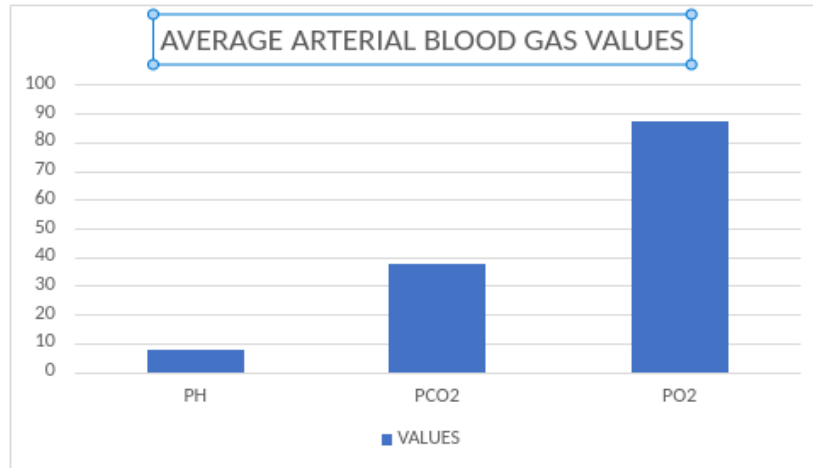
DIAGNOSTIC CRITERIA	NO OF PATIENTS	%
ABG	12	12%
CHEST X RAY	49	49%
HRCT	28	28%
CT SCAN	11	11%

Fig 9: Diagnostic criteria

Table 10: Average Arterial Blood Gas Values
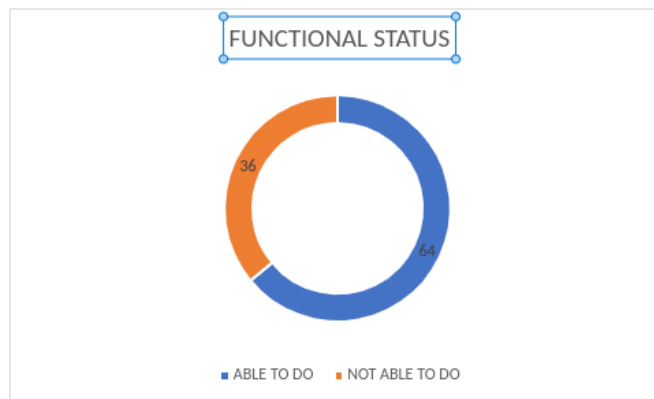
AVERAGE ABG	VALUES
PH	7.4
PCO2 (in mm hg)	37.5
PO2 (in mm hg)	87.25

Fig 10: Average arterial blood gas values

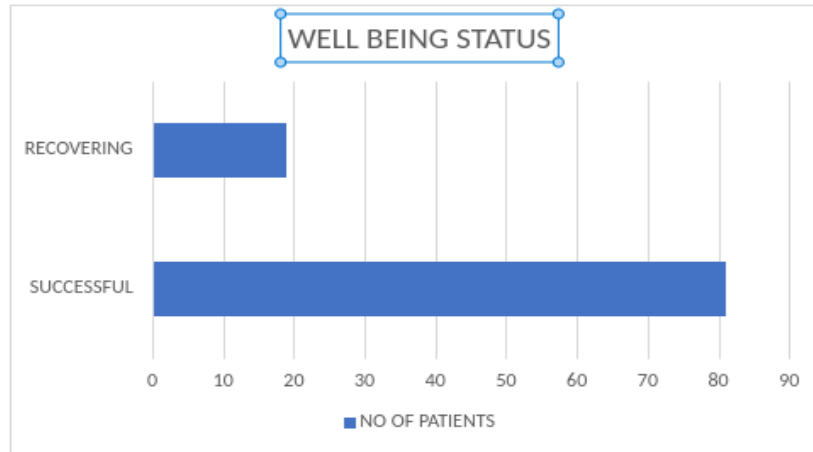**Table 11: Distribution of Patients Based on Their Fuctional Status**

FUNCTIONAL STATUS	NO OF PATIENTS	%
Able To Do on Their Own	64	64 %
Not Able To Do on Their Own	36	36 %

Fig 11: Functional status

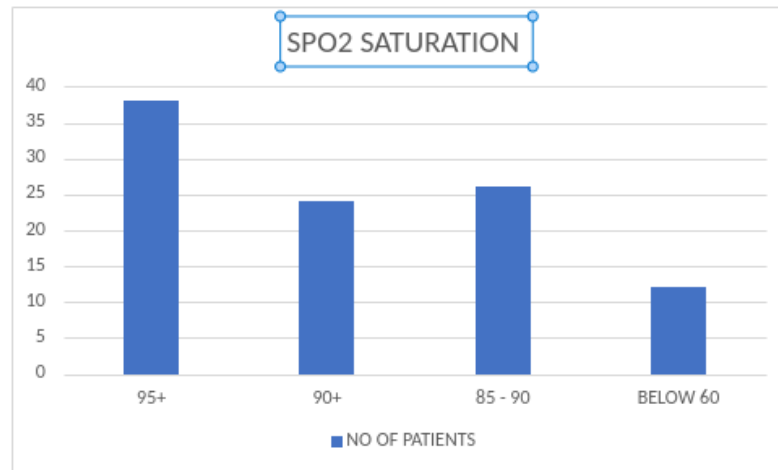**Table 12: Distribution of Patients Based on Their Well Being**

WELL BEING	NO OF PATIENTS	%
SUCCESSFUL	81	81%
RECOVERING	19	19%

Fig 12: Well being Status

Table 13: Distribution of Patients Based on Spo2 Saturation

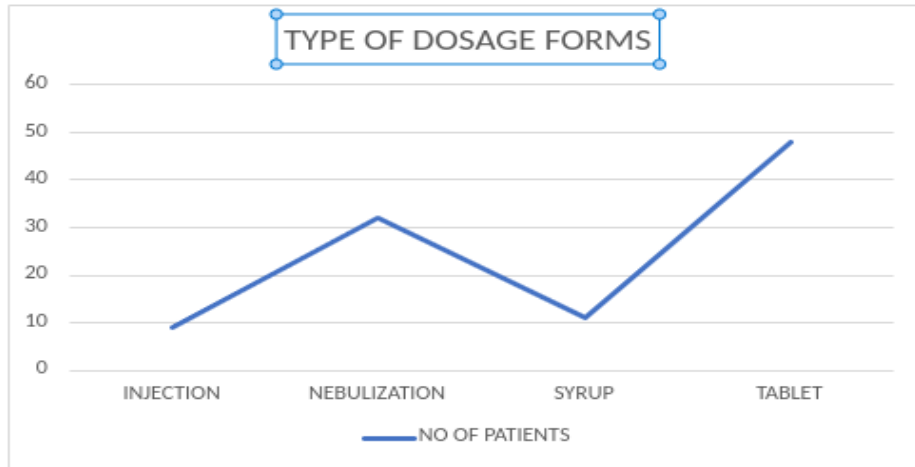| SPO2 SATURATION	NO OF PATIENTS	%
95+	38	38 %
90+	24	24 %
85-90	26	26 %
BELOW 60	12	12 %

Fig 13: SPO2 Saturation

Table 14: Distribution of Patients Based on Type of Dosage Forms Used

TYPE OF DOSAGE FORM	NO OF PATIENTS	%
INJECTION	9	9 %
NEBULIZATION	32	32 %
SYRUP	11	11 %
TABLET	48	48 %

Fig 14 : Type of Dosage forms

Table 15: Injections Prescribed

INJECTION	% OF PATIENTS
HYDROCORTISONE	21 %
INJ.KCL 20 meq + 2 gm MGSO4 IN 50 ml NORMAL SALINE	15 %
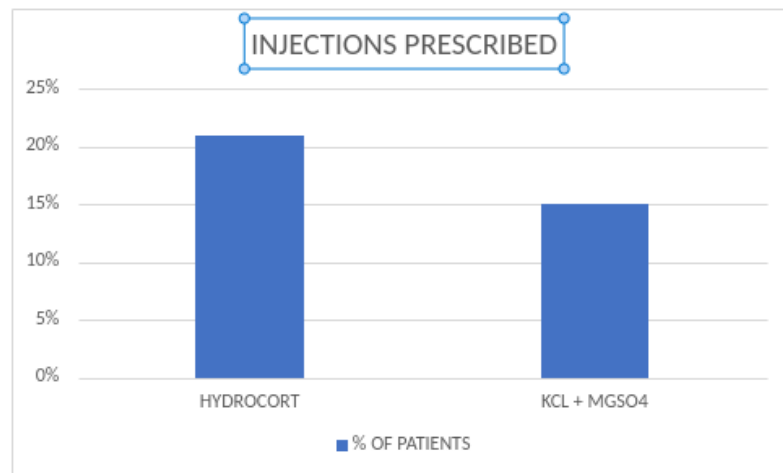
Fig 15: Injections Prescribed

Table 16: Nebulizers Prescribed

NEBULIZER	% OF PATIENTS
BUDECORT (Budesonide)	47 %
DUOLIN (Levo salbutamol + Ipatropium bromide)	49 %
ASTHALIN (Salbutamol)	3 %
LEVOLIN (Levo salbutamol)	11 %
GLYCOHALE (Glycopyrrolate)	2 %
FORMOFLO (Formoterol + Fluticasone propionate)	2 %
FORACORTE FORTE (Budesonide + Formoterol)	7%
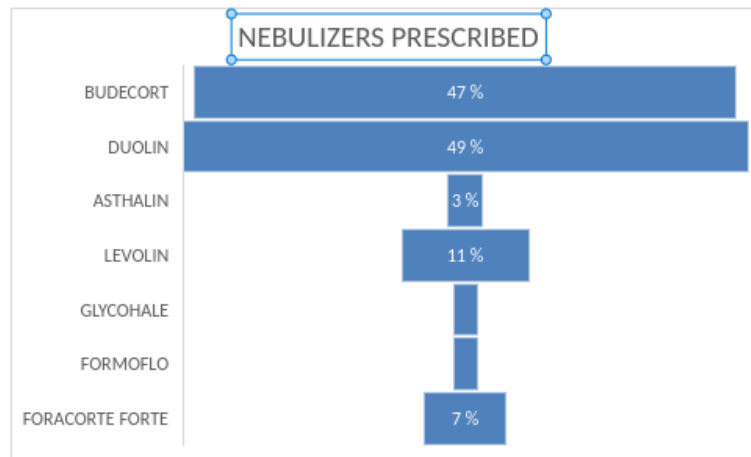
Fig 16: Nebulizers Prescribed

Table 17: Syrups Prescribed

SYRUPS	% OF PATIENTS
CHERICOF (Chlorpheniramine maleate, Dextromethorphan hydrobromide, Phenylephrine hydrochloride)	1 %
ASCORIL (Bromhexine,Guaifenesin, Salbutamol, Menthol)	5 %
GRILLINCTUS BM (Terbutaline sulphate , Bromhexine)	7 %
RESWAS (Levodropizine, Chlorpheniramine maleate)	14 %
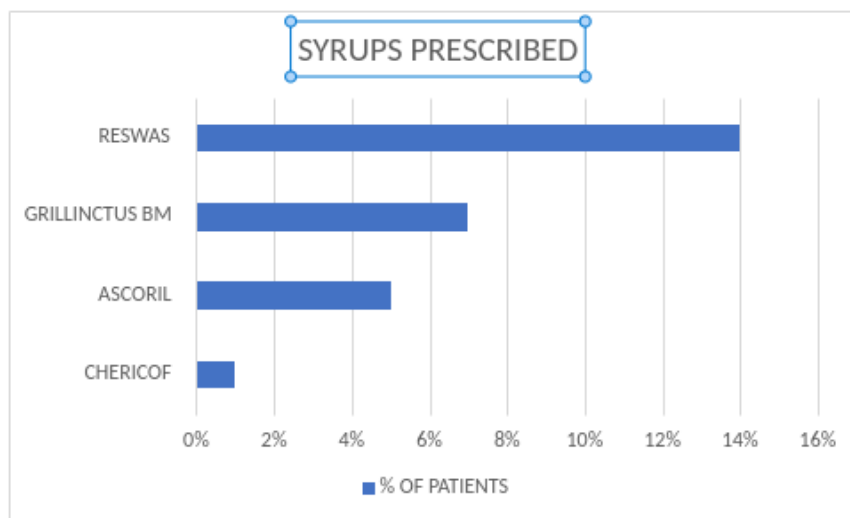
**Fig 17: Syrups prescribed**

Table 18: Tablets Prescribed

TABLETS	% OF PATIENTS
MONTEK-AB (Acebrophylline, Montelukast)	14 %
MUCINAC (Acetylcysteine)	27 %
BUDAMATE (Budesonide, Formoterol)	3 %
MONTEK LC (Montelukast sodium, Levocetrizine)	44 %
ASCORYL PLUS (Bromhexine hydrochloride,Guaifenesin, Terbutaline sulphate)	3 %
ALLEGRA (Fexofenadine)	1 %
MUCINAC AB (Acebrophylline, Acetylcysteine)	7 %
UNICONTIN E (Theophylline)	1 %
MONTAIR FX (Montelukast, Fexofenadine)	2 %
WYSOLONE (Prednisolone)	7 %
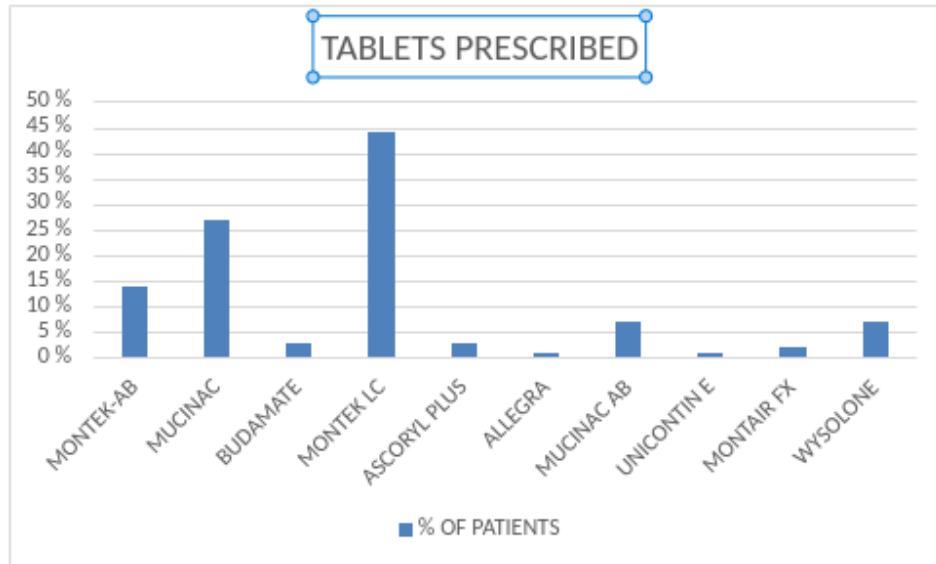
Fig 18: Tablets prescribed

Table 19: Capsules Prescribed

CAPSULE	% OF PATIENTS
AB FLO (Acebrophylline)	25 %
KARVOL PLUS (Menthol, Chlorothymol, Eucalyptol, Terpinol, Camphor)	9 %
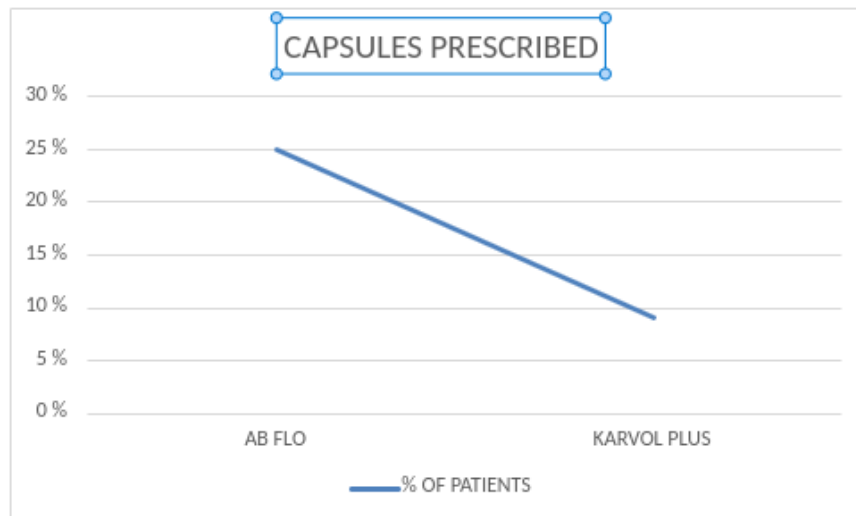
Fig 19: Capsules prescribed

Table 20: Distribution of Patients Based on Type of Diagnosis

DIAGNOSIS	NO OF PATIENTS	%
ACUTE EXACERBATION OF COPD	29	29 %
ACUTE EXACERBATION OF ASTHMA	24	24 %
SOB UNDER EVALUATION	22	22 %
COPD	9	9 %
ASTHMA	12	12 %
BRONCHIECSTASIS	4	4 %
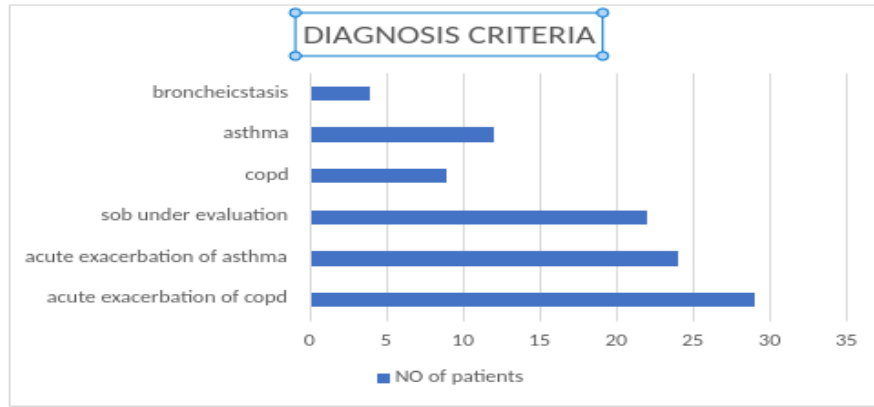
Fig 20: Diagnosis Criteria

Table 21: Distribution Of Patients Based On Non-Pharmacological Treatment

NON PHARMACOLOGICAL TREATMENT	% of patients
Pulmonary rehabilitation	45 %
Physical therapy	23 %
Steam inhalation	7 %
Long term oxygen therapy	9 %
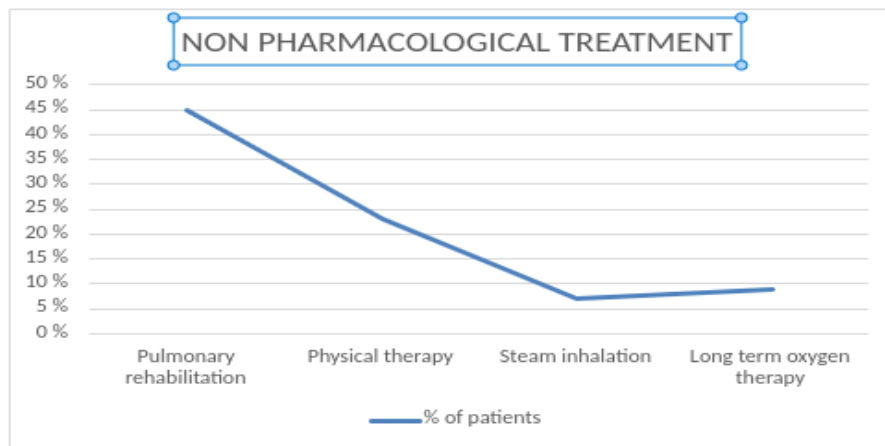
Fig 21: Non pharmacological Treatment
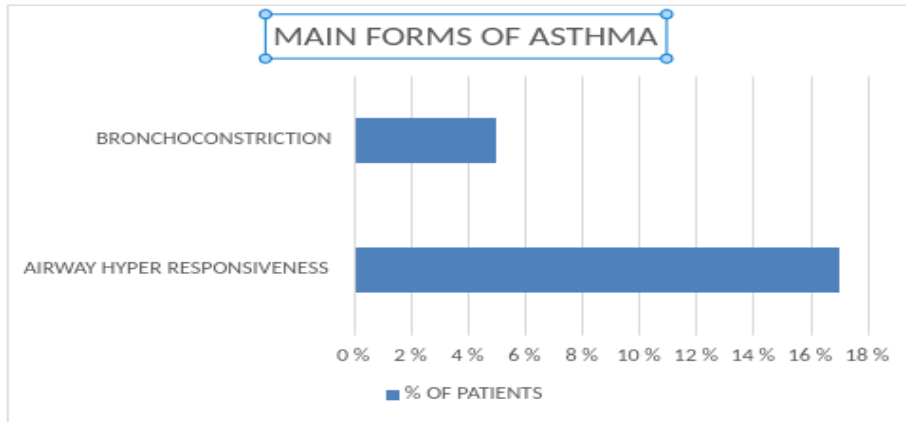
Table 22: Distribution of Patients With Copd

FORMS OF COPD	% OF PATIENTS
EMPHYSEMA	12 %
CHRONIC BRONCHITIS	8 %
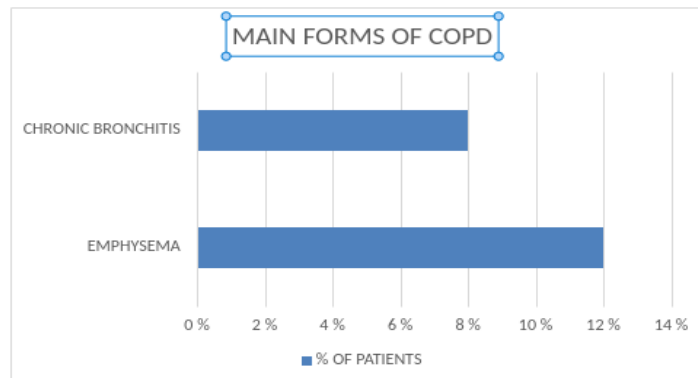
Fig 22: Main forms of COPD

Table 23: Distribution Of Patients With Asthma

FORMS OF ASTHMA	% OF PATIENTS
AIRWAY HYPER RESPONSIVENESS	17 %
BRONCHOCONSTRICTION	5 %

fig 23: Main forms of Asthma

Table 24: Distribution Of Patients Based On Symptoms

SYMPTOMS	% OF PATIENTS
FEVER	33 %
WHEEZING	6 %
SHORTNESS OF BREATH	37 %
COUGH	45 %
DRY COUGH	7 %
SPUTUM	23 %
CHEST TIGHTEDNESS	5 %
DYSPNEA	18 %
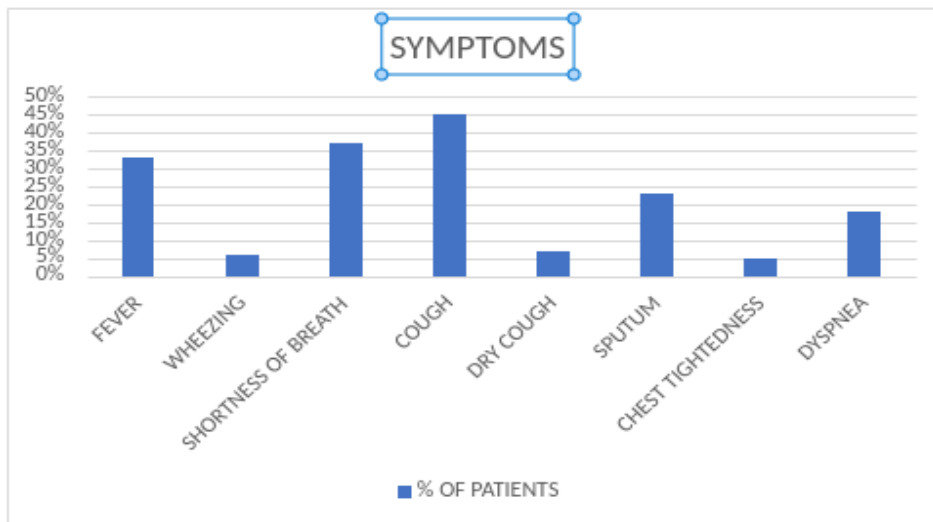
Fig 24: Symptoms

Table 25: Distribution Of Patients Based On Sputum Colour

SPUTUM COLOUR	% OF PATIENTS
YELLOW	12 %
GREEN	6 %
WHITE	8 %
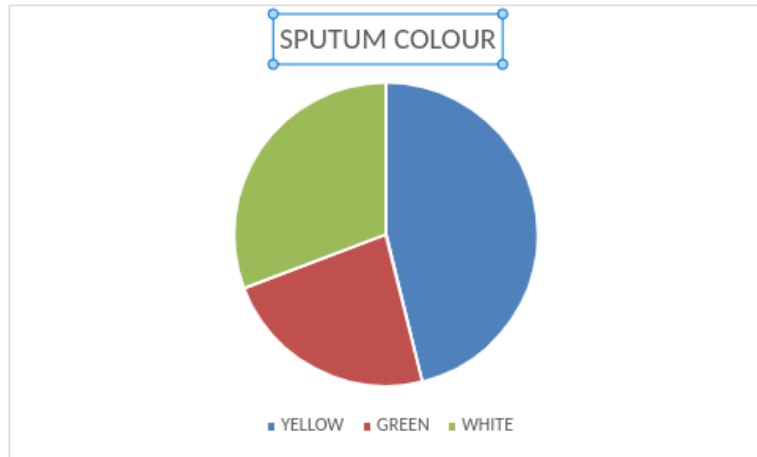
Fig 25: Sputum Colour

Table 26: Number Of Patients Having Obstructive Lung Diseases Due To Heredity

CONDITION	% OF PATIENTS
HEREDITY	3 %
OTHERS	97 %
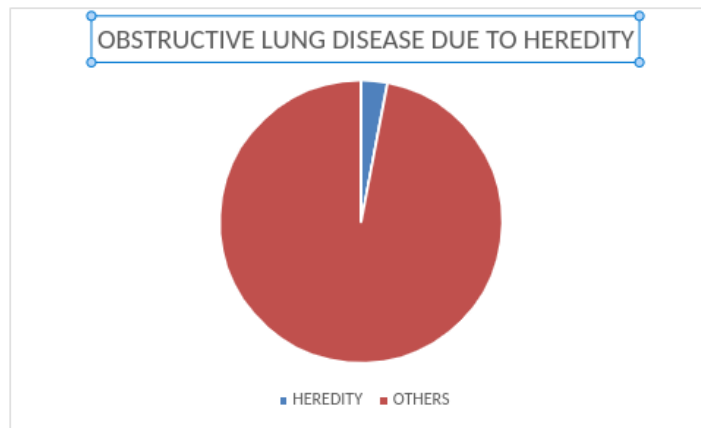
Fig 26: Obstructive lung disease due to Heredity

Table 27: Distribution Of Patients Based On Their Lifestyle

LIFESTYLE	% OF PATIENTS
EARLY ONSET ASTHMA	3 %
EXERCISE INDUCED ASTHMA	1 %
OCCUPATIONAL ASTHMA	16 %
ALLERGIC ASTHMA	7 %

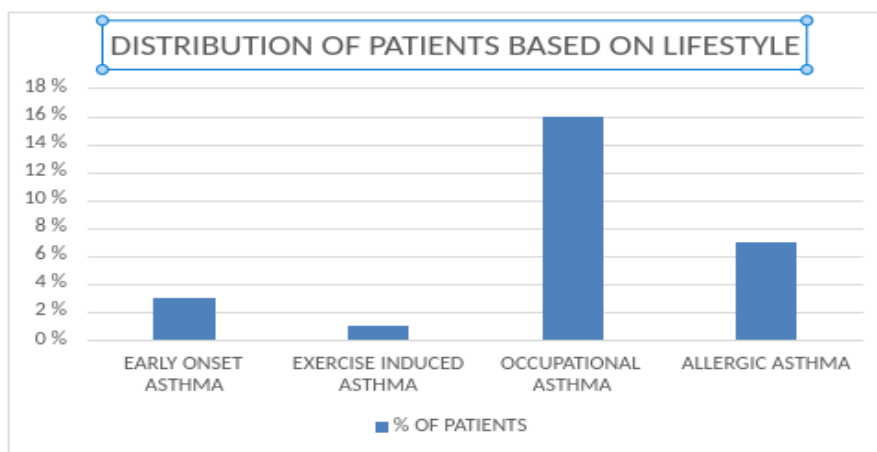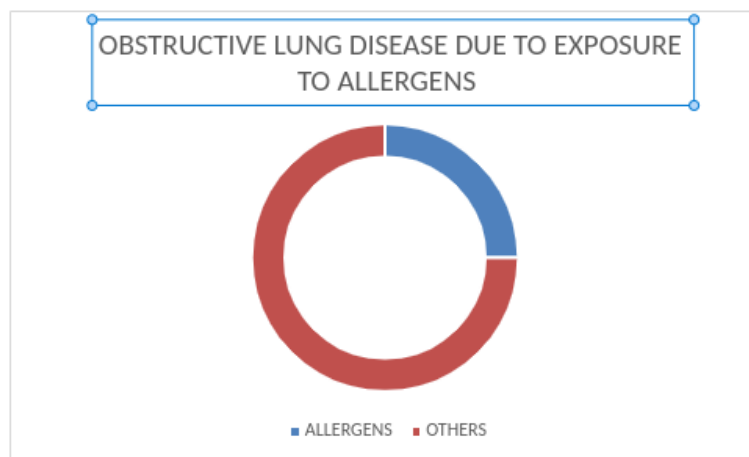**Fig 27: Distribution of patients based on lifestyle**

Table 28: Number of Patients Having Obstructive Lung Disease Due To Exposure To Allergens

CONDITION	% OF PATIENTS
ALLERGENS EXPOSURE	25%
OTHERS	75%

Fig 28: Obstructive lung disease due to exposure to allergens

DISCUSSION

We have considered 100 patients for the study; where different parameters have been taken to evaluate the disease condition such as COPD, Asthma and bronchiectasis.Age, is one of the parameters where mostly affected individuals age ranging between 61-70 years. Gender, males are prone to disease condition than females. Social history of smoking causing highest prone to disease than alcoholism and tobacco chewing. Patients with medical history of bronchial asthma are at risk of developing acute or chronic exacerbations of COPD, infection of Koch's leading to cause of asthma and COPD. Post covid-19 status has no remarkable effect on obstructive lung diseases. Mortality rate observed were 12%. Early onset of asthma observed in the patients is 3%. Exercise induced asthma can be seen in 1% of patients. In case of occupational asthma, we observe 16% of patients working in factories and industries. Allergic asthma can be seen in 7% of the patients. Hereditary found in 3% of the patients.

Comparing the symptoms
- Shortness of breath can be seen in 37% of patients
- Cough observed in 45% of patients
- Fever observed in 33% of patients
- Wheezing observed in 6% of patients
- Sputum production observed in 23% of patients
- Exertional dyspnoea is seen in 18% of patients
- Chest tightness can be seen in 5% of patients

In case of copd, emphysema cases are 12%, Chronic bronchitis cases were 8%.
In case of Asthma, Airway hyperresponsiveness cases seen are 17%, Bronchoconstriction cases were 5%.
In case of disease status diagnosis, ABG was done to patients 12%, Chest X-ray -49%,HRCT -28%, CT scan-11%
Average ABG analysis noted were-Ph-7.4mmHg, Pco2-37.5mmHg, Po2-87.25 mmHg.

Diagnosis

Acute exacerbation of copd -29%, Acute exacerbation of asthma -24%, SOB under evaluation-22%, Asthma-12%, Copd-9%, Bronchiectasis-4%.

CONCLUSION

In our present study, we performed a randomized, concurrent, observational and comparative study on patients diagnosed with obstructive lung diseases in Gleneagles Global Hospital to evaluate the following: The Observational study was conducted in 100 patients to assess the clinical parameters required for the study. The clinical parameters chosen are age, gender, past medical history, social history, post covid or not, mortality rate, lifestyle status, exposure, hereditary, symptoms, treatment, Diagnosis, diagnostic criteria, type of dosage form were collected and assessed. During the study, we found that, the results obtained such as male (61%) has highest rate of diseased rate than women (39%). Men with social habit of smoking are more prone to obstructive lung disease (66%). Past medical history of Asthma is one of the leading causes to develop obstructive lung disease (36%) including early onset of asthma. In case of symptoms, we observed cases of cough (45%), shortness of breath (37%), sputum production (23%), exertional dyspnoea (18%). Final diagnosis were Acute exacerbations of COPD (23%), Acute exacerbations of Asthma (21%), Shortness of breath under evaluation (30%), chronic obstructive pulmonary disease (9%), Asthma (13%), Bronchiectasis (4%). Uncontrollable social habits and lack of knowledge leading to increase of different lung diseases. During the study, we counselled the patients and provided some knowledge about the disease so, we can avoid irrational use of drugs and optimise drug therapy. The study related to adverse effects, associated with prescribed drugs, for treating obstructive lung diseases with different dosage forms can be studied. Duolin (Ipratropium bromide+ Levosalbutamol) has shown highest efficacy in treating with nebulization dosage form, whereas, Montel-LC (Montelukast + levocetrizine) has shown highest efficacy in tablet dosage form. Thus, from the study we have concluded that the patients aged between 61-70, has social habit of smoking and having past medical history of bronchial asthma has more prone to disease. Nebulization therapy has shown the highest efficacy, the addition of corticosteroids had decreased the patient stay in the hospital. Quality of life questionnaire and clinical questionnaire were able to answer most of the questions we have about the disease.

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