

Market Assessment of Beta-Adrenergic Drugs as ANTI-COPD medication in different areas of Rajasthan

By

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of the degree*

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This is to certify that dissertation title **Market Assessment of Beta Adrenergic Drugs as Anti-COPD Drugs in different areas of Rajasthan** is a record of the research work undertaken by **ANKITA DAS** in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

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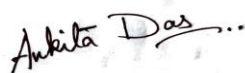
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DECLARATION BY STUDENT

I, Ankita Das Enrollment No. IIHMR-U/02/2019-21/0169 hereby declare that this dissertation titled **Market Assessment of Beta Adrenergic Drugs as Anti-COPD Drugs in different areas of Rajasthan** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



(Signature)

Name of Student: Ankita Das

Date: 02-07-2021

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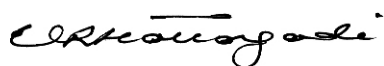
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Preface

All the information provided in this dissertation report are true to my knowledge acquired in my course of study as well as during my dissertation time span. The work done here is to understand in depth about the Pharmaceutical market and the assessment of the same. It includes both open ended and non-open ended questions which helped to gather more information about the project.

I am glad that I was offered the guidance and support of Mr. Vivek Hattangadi Sir from The Enablers who helped me out to analyse and evaluate this project very closely and successfully.

Received



Vivek Hattangadi

27th June 2021

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I'm above all thankful to my University, Indian Institute of Health Management Research, Jaipur for giving me an open opportunity, which assisted me with expanding an all around data on the working of a crisis facility.

I extend by heartfelt regards to **Mr. Vivek Hattangadi (Chief Mentor, The Enablers)** for offering me a particularly mind blowing learning chance and for guiding me at every movement, for allowing me opportunities of sensible learning by disseminating me expects and ceaselessly being open for useful discussions and for showing unmistakable interest and also being pleasant and strong all through my time of my dissertation.

I also want to extend up my note of appreciation to my guide at IIHMR University, **Mr. Rahul Sharma (Associate Professor, IIHMR University)** for being my consistent aide and persistently being open whenever I required his guidance.

ABSTRACT

The purpose in doing this study is to discover where precisely the region Jodhpur, Pali and Bhinmal of Rajasthan lie as far as COPD disease is concerned. The study based questionnaire comprises of inquiries which straightforwardly draws out the significant manifestations of COPD, the age bunch which is significantly influenced by COPD and the best part is it shows the main firm in COPD medication deals.

Rajasthan stands first among the s Mortality(COPD Death Rate). So it ends up being a valuable region to conduct the survey regarding the COPD medicines.

The overview was directed among 100 specialists all spread over these three areas of Rajasthan.

This survey also tells us about the competitor analysis of the various organisations as well.

INTRODUCTION

The World Health Organization (WHO) portrays Chronic Obstructive Pulmonary Disorder (COPD) as: 'a lung infection portrayed by chronic obstruction in the airway of the lungs and is isn't absolutely reversible'. The airway obstruction in COPD is a direct result of damage to the lung construction and devastation of lung tissue (emphysema). This is consistently a result of smoking or monotonous exposure to the polluted environment. While preventable (COPD is essentially achieved by smoking) and dynamically treatable, the airway obstruction seen in COPD is for the most dangerous. The continuous and the genuine effect of COPD have been seen, including weight decrease, dietary disrupting impacts and strange skeletal muscle work. COPD is also from time to time associated with, and may contribute towards, different concurring ailments, for instance, coronary disease, osteoporosis, and diabetes, which may in turn result in mortality.

COPD is a considered among one of the main causes of death throughout the world. Worldwide COPD is mainly a problem because of unhealthy living style and an equally unhealthy environment like smoke pollution, smog and many more such environmental problems. This prevalence is likely to increase because of traffic pollution and not enough attention is being given to a green environment. The weightage of COPD are expected to enhance throughout increase in time due to continue with prologue to COPD danger factors and developing of the World's general population (Hammad Qureshi, 2014).⁽¹¹⁾

Use of Beta-Blockers in COPD

Beta-blocker use is related with decreased in-medical clinic and all-cause mortality among patients with COPD and CVD. Utilization of cardio-specific beta-blockers is related with diminished danger of COPD fuel. Defensive impacts of beta-blockers might be driven to a limited extent by pulse decrease.

The meta-investigation furnishes consolation that patients with COPD who have a cardiovascular sign for beta-blocker ought to be treated by current rules. By bringing down pulse, beta-blockers may give security against myocardial injury because of supply-request confuse, especially when beta-agonist bronchodilators are utilized. Beta-blockers can likewise affect lung aggravation and bodily fluid discharge. The evident differential impact of cardio-specific and non-cardio-specific beta-blockers on COPD compounding is meriting further investigation, however especially in patients with COPD who have hyper-responsive air routes, it very well might be judicious to pick cardio-particular beta-blockers (Cazzola, n.d.).⁽¹⁰⁾

BACKGROUND

Definition:

COPD is a preventable, and treatable constant lung illness which influences people around the world.

Abnormalities in the little air routes of the lungs lead to impediment of wind stream all through the lungs. Various cycles cause the air routes to get restricted. There might be obliteration of parts of the lung, mucus impeding the air routes, and irritation and growing of the aviation route lining.

COPD is at times called "emphysema" or "chronic bronchitis". Emphysema ordinarily results to destruction of the small air sacs toward the end of the air routes in the lungs. Chronic bronchitis alludes to an ongoing hack with the creation of mucus coming out because of aggravation in the air routes.

COPD and asthma share normal manifestations (hack, wheeze, and trouble breathing) and individuals may have the two conditions (Anon., 2021).⁽³⁾

Causes of COPD

COPD grows continuously after some time, regularly coming about because of a mix of hazard factors:

- tobacco exposure – from dynamic smoking or uninvolvement to recycled smoke;
- work related openness to dust particles, exhaust, or synthetic compounds;
- indoor air contamination – biomass fuel (wood, creature compost, crop buildup) or coal is regularly utilized for cooking and warming in low- and center pay nations with undeniable degrees of smoke openness;
- asthma in adolescence; or potentially
- an uncommon hereditary condition called alpha-1 antitrypsin inadequacy, which can cause COPD at a youthful age (Anon., 2021).⁽³⁾

Concepts of Chronic Bronchitis and Emphysema

Chronic Bronchitis

Bronchitis is an aggravation of the coating of the air tubes. These are those that convey air to and from your lungs. Individuals who have bronchitis frequently have a relentless hack that raises thickened, stained bodily fluid. They may likewise encounter wheezing, chest tightness and continuous mucus (Anon., 2019).⁽¹⁾

Symptoms of Chronic Bronchitis

Symptoms include irritation in the air tubes, increase in mucus. The mucus can be yellow, green or white. (Anon., 2019).⁽¹⁾

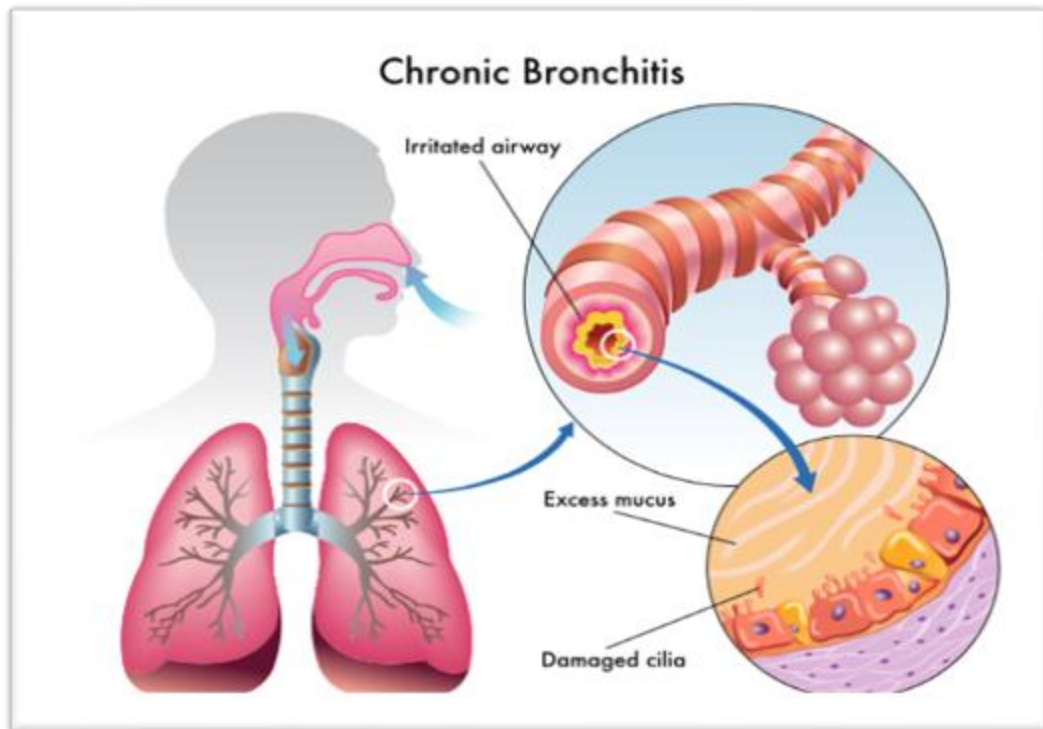


Figure 1: Chronic Bronchitis in Airways (Anon., n.d.). ⁽⁵⁾

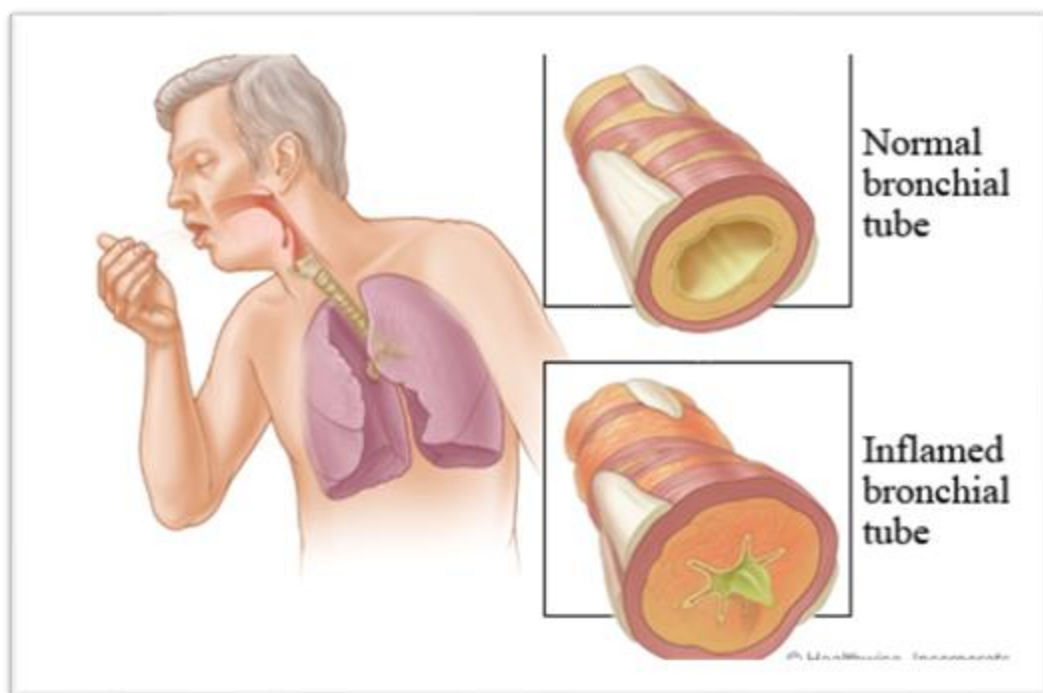


Figure 2: Normal v/s Inflamed Bronchial Tube (Anon., n.d.). ⁽⁵⁾

Emphysema

Emphysema is a lung condition that causes exhausted like conditions. In emphysema, alveoli's are hurt. After some time, the interior dividers of the air sacs debilitates and break — making greater air spaces as opposed to various little ones. This brings down the surface space of the lungs and, subsequently, the sum oxygen that shows up at the circulatory framework.

By far most with emphysema also have relentless bronchitis.

Emphysema and steady bronchitis are two conditions that make up continuous obstructive pneumonic ailment (COPD). Smoking is the primary wellspring of COPD. Treatment may direct the development of COPD, be that as it may it can't pivot the mischief (Anon., n.d.).⁽⁴⁾

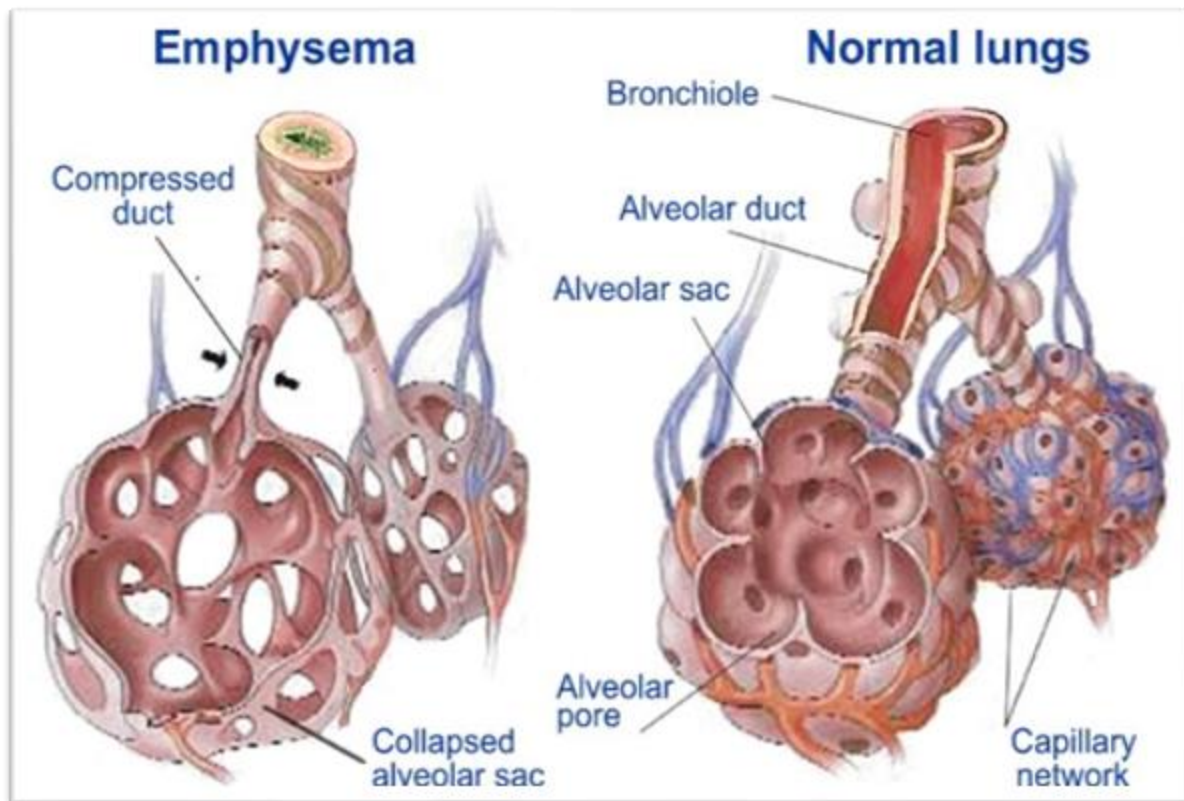


Figure 3: Emphysema in airways (Anon., n.d.).⁽⁴⁾

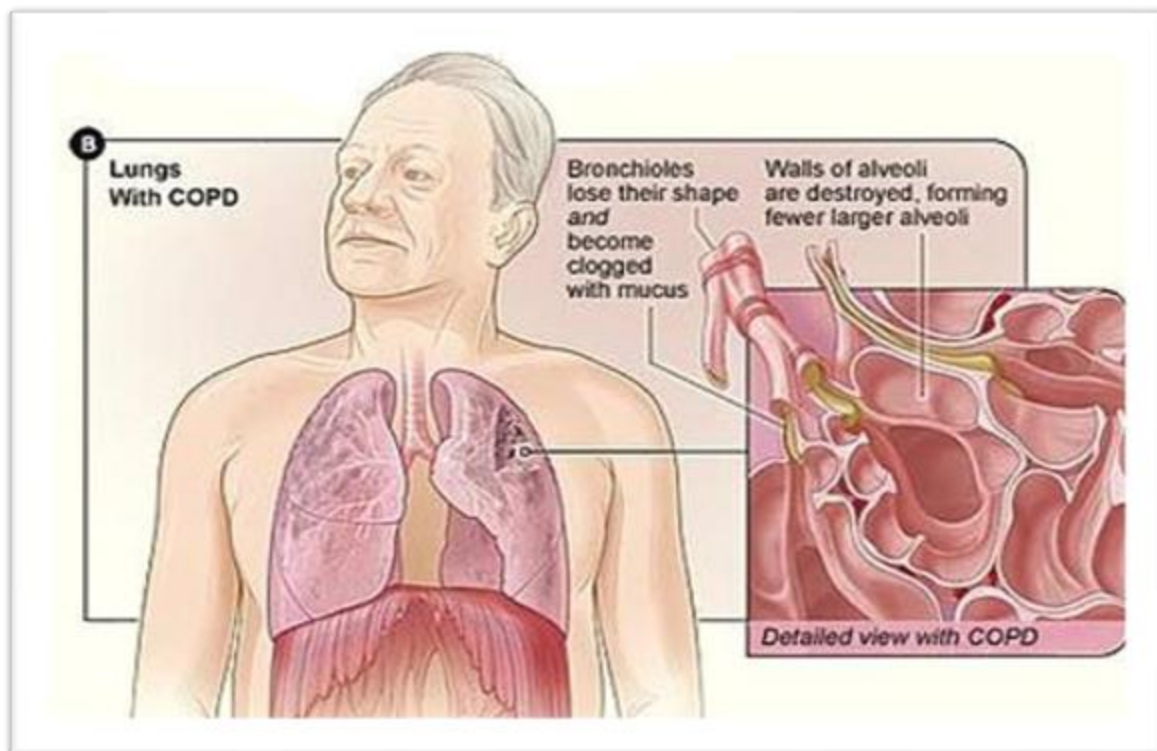
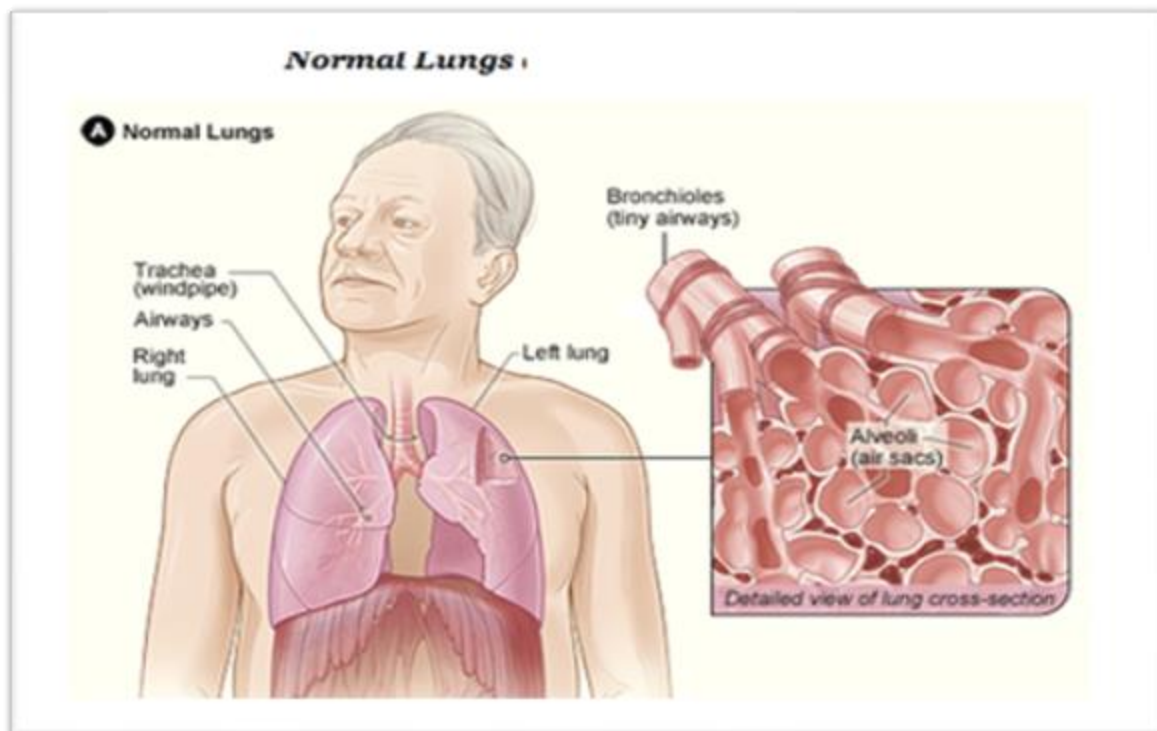


Figure 4 : Normal Lungs v/s COPD affected lungs (Anon., n.d.).⁽⁵⁾

Pathophysiology of COPD

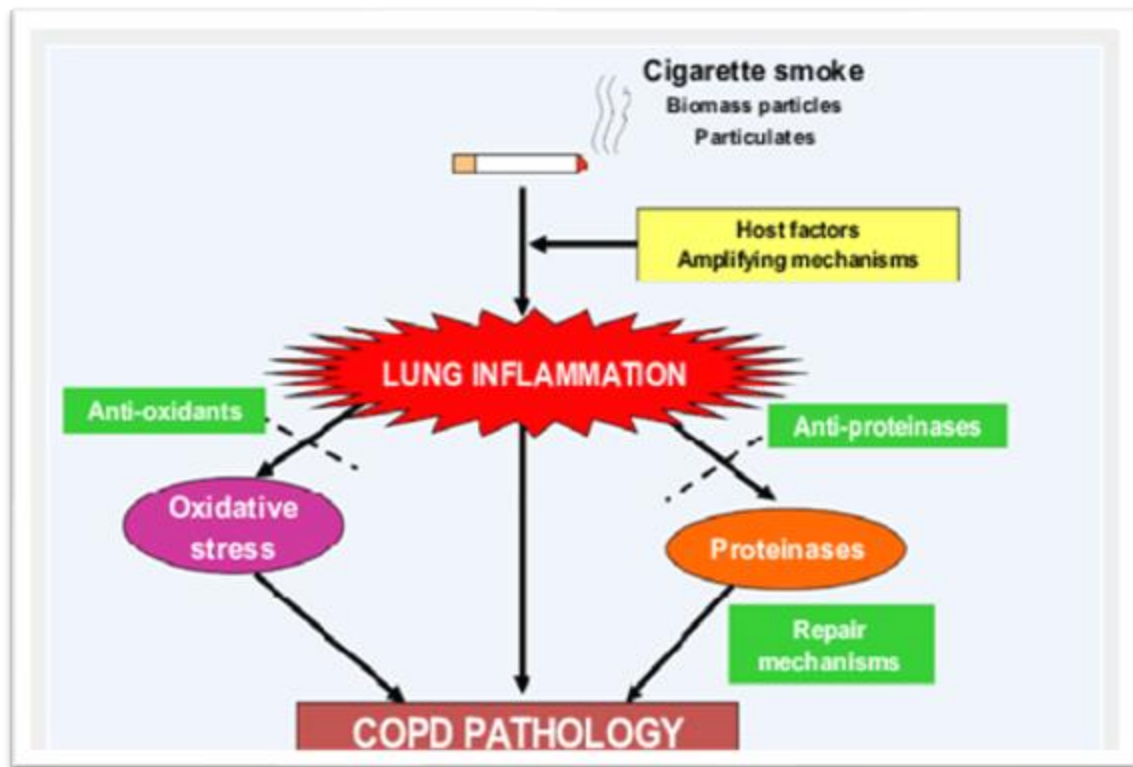


Figure 5: Pathology in COPD (Anon., n.d.).⁽⁶⁾

COPD is caused by the inflammation of the lung, particularly the small airways. In COPD the normal protective response of the body against the toxins is increased leading to tissue destruction, impairment in the repair mechanism of the tissues. This in turn increases the physiological abnormalities such as mucous secretion, ciliary dysfunction, airway blockade, pulmonary hypertension and systemic effect.

Abnormal air flow causes initial asthma like symptoms which further aggravates to COPD if not treated in time.(MacNee, n.d.).⁽¹⁵⁾

Key Symptoms for COPD Diagnosis

COPD is portrayed by a longstanding (persistent) impediment to wind stream out of the lungs. It can take various structures and have various manifestations. Indications of COPD can likewise change in seriousness.

Indications include:

- a persistent cough,
- lack of breathe, and
- successive respiratory contaminations
- wheezing

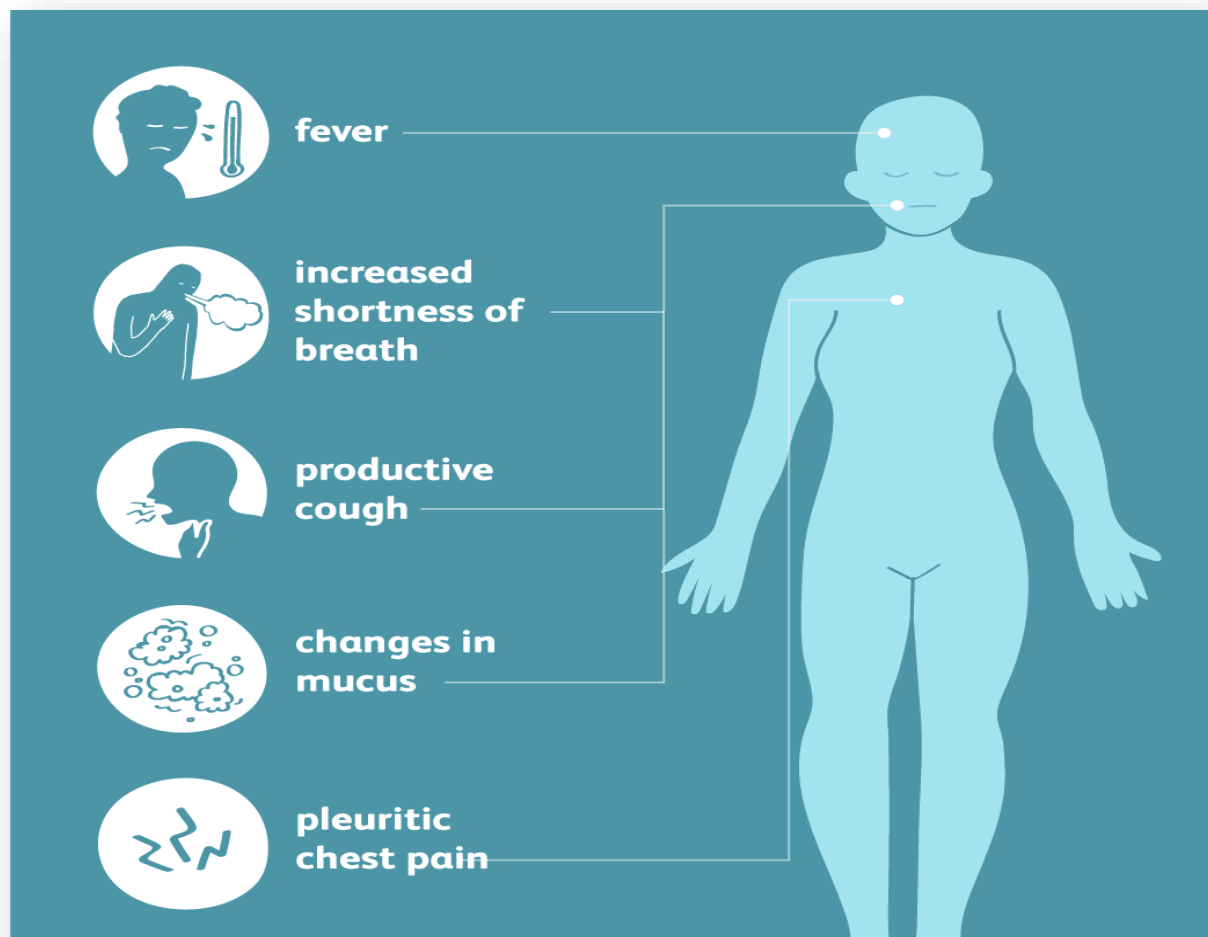


Figure 6: Shows the main symptoms of COPD (Leader, 2020).⁽¹⁴⁾

Diagnosis of COPD

Spirometry is to gauge the measure of air an individual can inhale out, and the measure of time taken to do as such.

A spirometer is a gadget used to gauge how adequately and how rapidly the lungs can be discharged.

Spirometry estimations utilized for conclusion of COPD include:

- FVC (forced vital capacity)
- FEV1 (forced expired volume in one second)
- FEV1/FVC

The proportion FEV1/FVC is somewhere in the range of 70% and 80% in typical grown-ups; a worth under 70% demonstrates wind stream constraint and the chance of COPD.

FEV1 is impacted by the age, sex, tallness, and nationality, and is best considered as a level of the anticipated typical worth (Anon., n.d.).⁽⁷⁾

► FEV₁ PROGRESSION OVER TIME

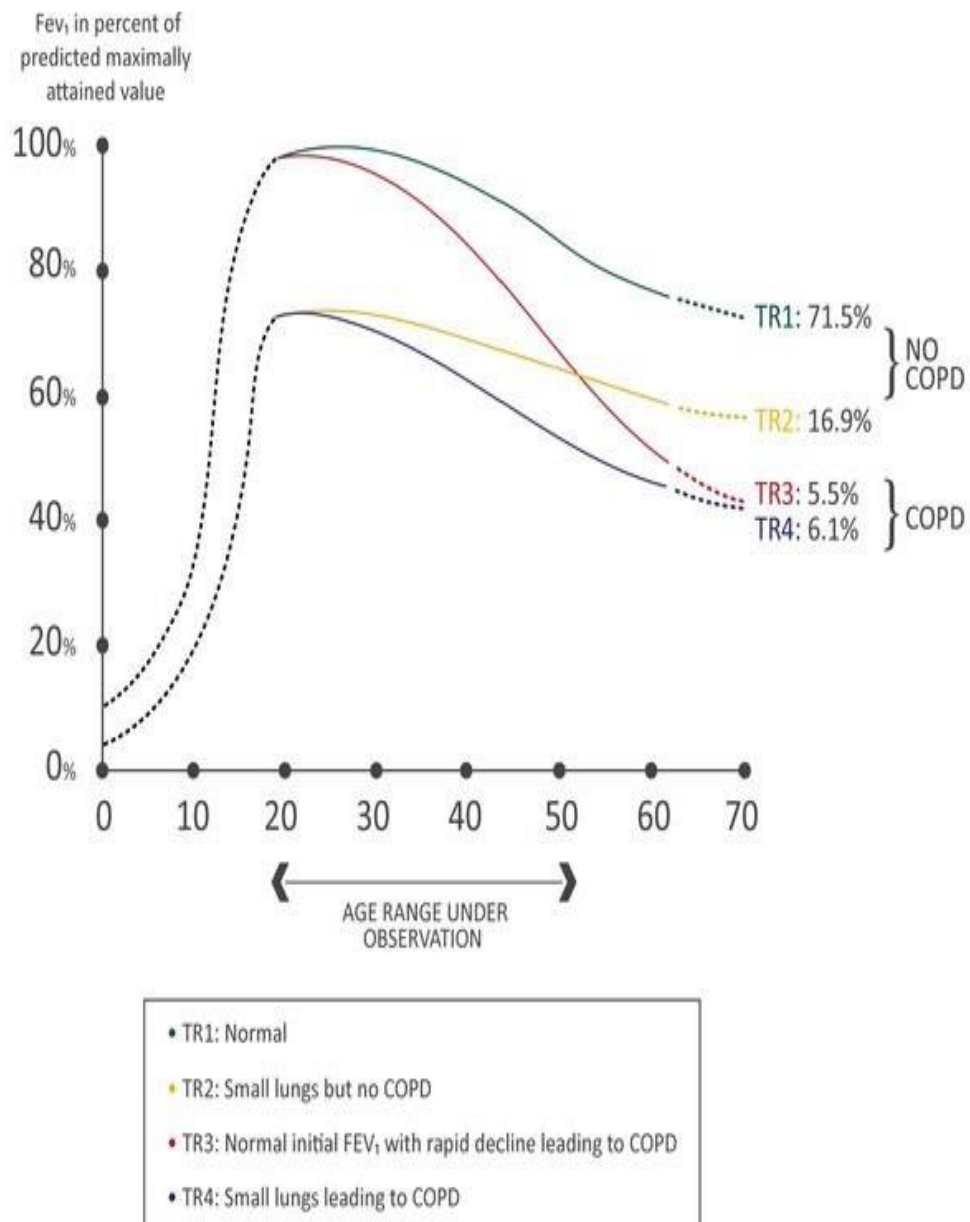


Figure7: FEV₁ v/s Time (Anon., 2019).⁽¹⁾

Literature Review

As per the journal published by NCBI the mortality and frequency of constant obstructive aspiratory sickness (COPD) and coronary illness increment with age. Notwithstanding the obvious proof of beta blockers (BBs) viability, there is an overall hesitance to utilize them in patients with COPD because of an apparent side effects and dread of initiating antagonistic responses and bronchospasm. BBs are all around endured in patients with cardiovascular illness and accompanying COPD with no proof of deteriorating of respiratory indications or FEV1, and the wellbeing of BBs in patients with COPD has been illustrated, however their utilization in this gathering of patients stays low. The total proof from preliminaries and meta-examination shows that cardio-selective BBs ought not be retained in patients with receptive aviation route illness.

Sometimes people suffering from the disorder have increase occurrence of heart occasions requiring cautious thought of prophylactic treatment.

(Khaled Albouaini, 2007).⁽¹²⁾

PubMed Journal by Rabe KF, Hurd S, Anzueto A, et al. says the underlying stage in understanding report for COPD management, circulated in 2001. The present, as of late revised chronicle follows a comparable association as the main accord report, anyway has been revived to show various circulations on COPD that have appeared. GOLD public pioneers, an arrangement of overall subject matter experts, have begun assessments of the main reasons and inescapability of COPD in their countries. The GOLD movement will continue carrying COPD to the thought of governments, general prosperity specialists, restorative administrations workers, and the general populace, anyway a deliberate effort by completely connected with social protection will be significant (Klaus F Rabe, 2007).⁽¹³⁾

Celli BR, Halbert RJ, Nordyke RJ, Schau B. in a diary clarifies Chronic Obstructive Pulmonary Disorder(COPD) is for the most part depicted as a contamination of cigarette smoking. COPD is every so often viewed as in individuals with no smoking history beside concerning another show. As necessities be, the contamination has not been especially portrayed in these "never smokers." We evaluated flight course obstacle (described as compelled expiratory volume in 1 second/obliged fundamental breaking point <0.70) in US adults are the one's who never did smoking. (Bartolome R Celli, 2005). ⁽⁸⁾

NCBI article states that, Bronchial asthma and COPD (persistent obstructive pneumonic sickness) are obstructive aspiratory infections that influenced a great many individuals everywhere on the world. Asthma is a genuine worldwide medical condition with an expected 300 million influenced people. COPD is one of the significant reasons for ongoing grimness and mortality and one of the significant general medical conditions around the world. Despite the fact that asthma and COPD have numerous similitudes, they likewise have numerous distinctions. They are two distinct illnesses with contrasts in etiologic, side effects, sort of aviation route irritation, fiery cells, go between, outcomes of aggravation, reaction to treatment, course. A few likenesses in aviation route aggravation in extreme asthma and COPD and great reaction to joined treatment in both of these illnesses recommend that they have some comparable pathophysiologic attributes. The point of this article is to show likenesses and contrasts between these two sicknesses. Today asthma and COPD are not completely reparable, not adequately recognized and not sufficiently treated and the treatment is as yet creating. Yet, in future better comprehension of pathology, satisfactory recognizing and treatment, might be and new medications, will give a greatly improved personal satisfaction, decreased grimness and mortality of these patients (Vesna Cukic, n.d.; Vesna Cukic, n.d.). ⁽¹⁵⁾

Rationale of the Study

Questionnaire based study that was prepared. That questionnaire was sent to different specialists in Jodhpur, Pali and Bhinmal regions of Rajasthan.

The Market Assessment gives the following result:

- Boundaries used by the specialists to endorse a specific medication for COPD
- Broadly seen side effects for COPD
- Delayed consequence of utilizing the prescription.

Research Objective

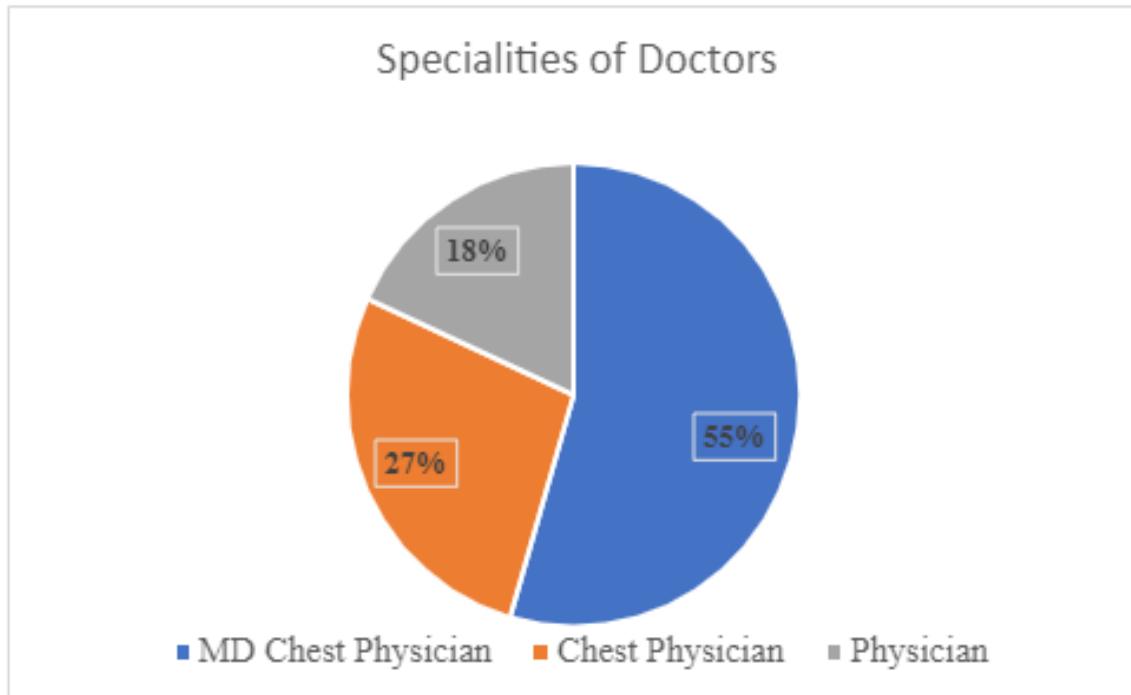
To assess the market of medication of COPD in sampled district of Rajasthan i.e., Jodhpur, Bhinmal and Pali and also study how much affected those areas are w.r.t to COPD.

Research Methods

Study Design:	Descriptive Study
Data type:	Quantitative Data
Data Collection Tool:	Questionnaire Tool
Timeline of Study:	3 Months (March 2021-June2021)
Sampling Units:	Data from Jodhpur, Pali and Bhinmal in Rajasthan
Sample Size:	100 Doctors

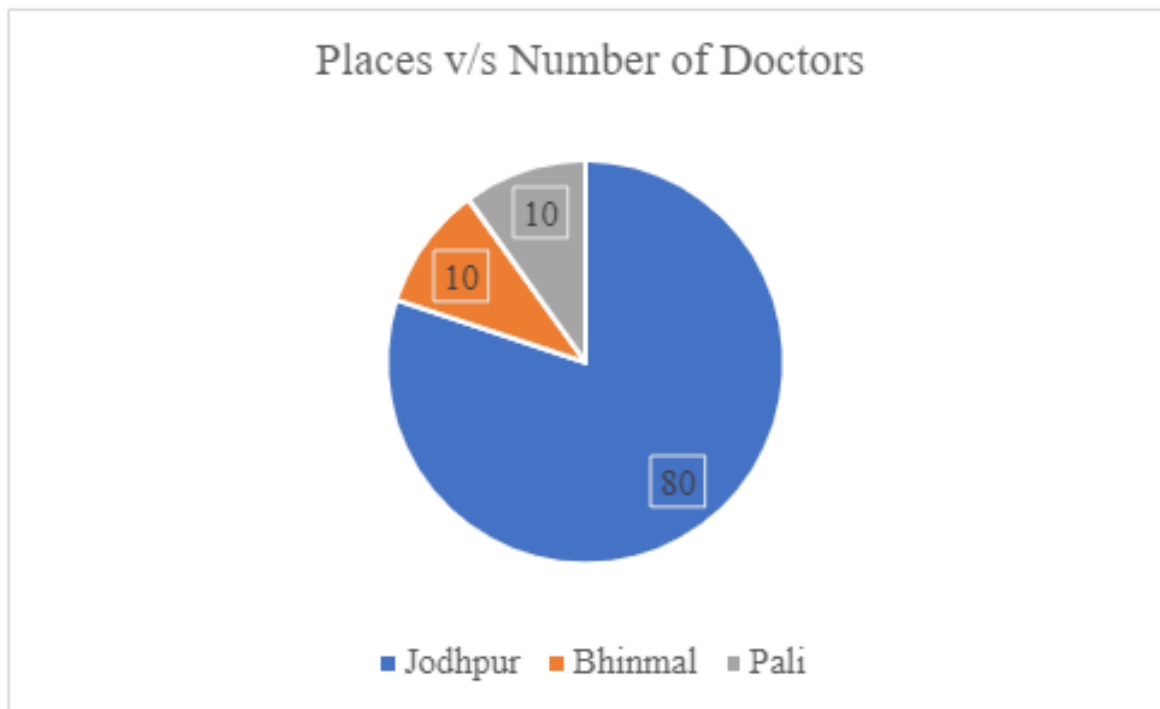
RESULT

Q1. Speciality of Doctor



Inference: The pie chart shows that almost 55% of the Doctors were MD Chest Physician, then 27% are Chest Physicians and the remaining 18% were only Physicians.

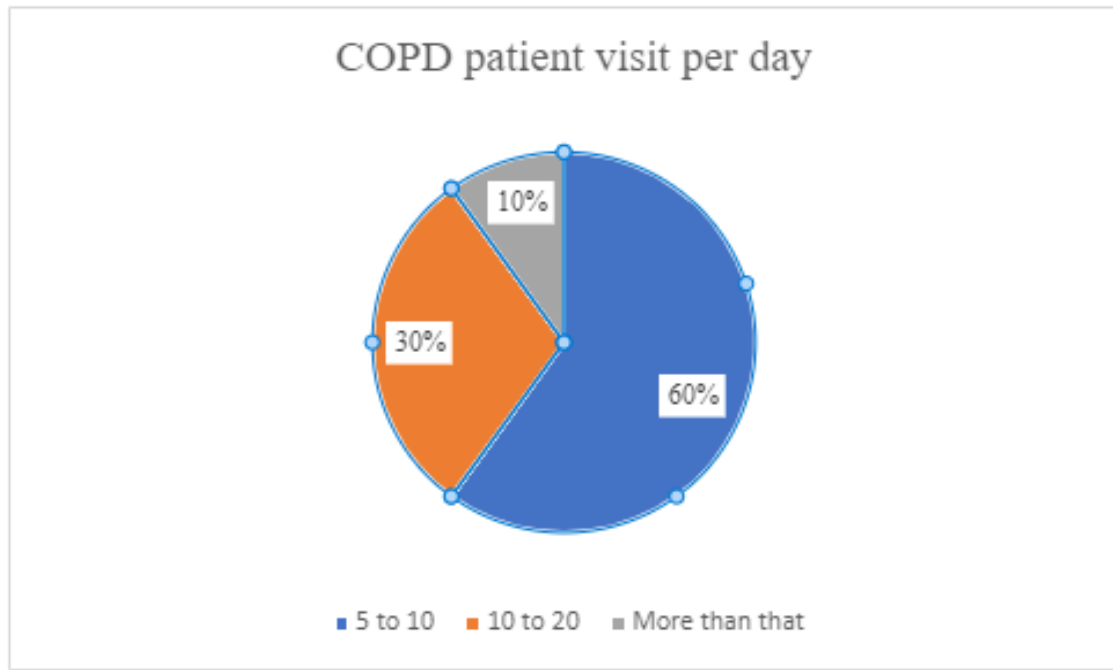
Q2. Place



Inference: The survey was conducted in three particular places of Rajasthan i.e., Jodhpur, Bhinmal and Pali and from the graph it is evident that 80 doctors were from Jodhpur then 10 doctors from Bhinmal and remaining 10 doctors from Pali

Q3. How many patients with COPD disorder visit your clinic per day?

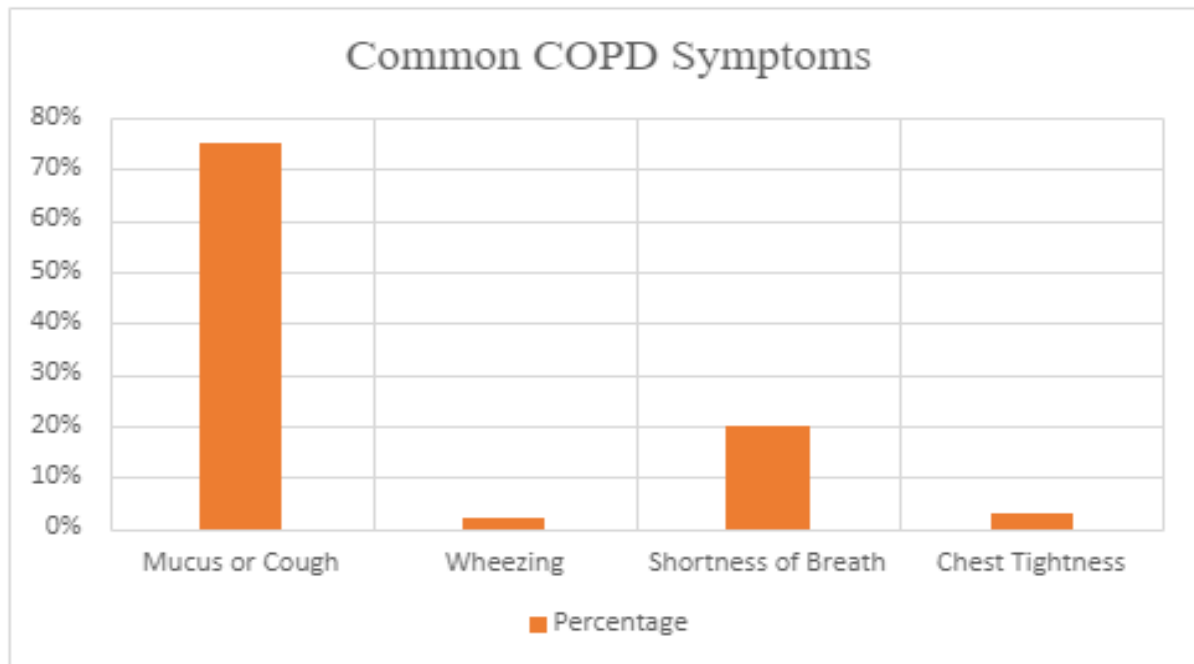
- i. 5-10
- ii. 10-20
- iii. More than that



Inference: The above chart shows that 60% of the clinics have a regular of 5-10 patients a day, 30% of the clinics have 10-20 patient a day and 10% of the total have more that 20 patients a day.

Q4. What are the major symptoms shown in any COPD patients:

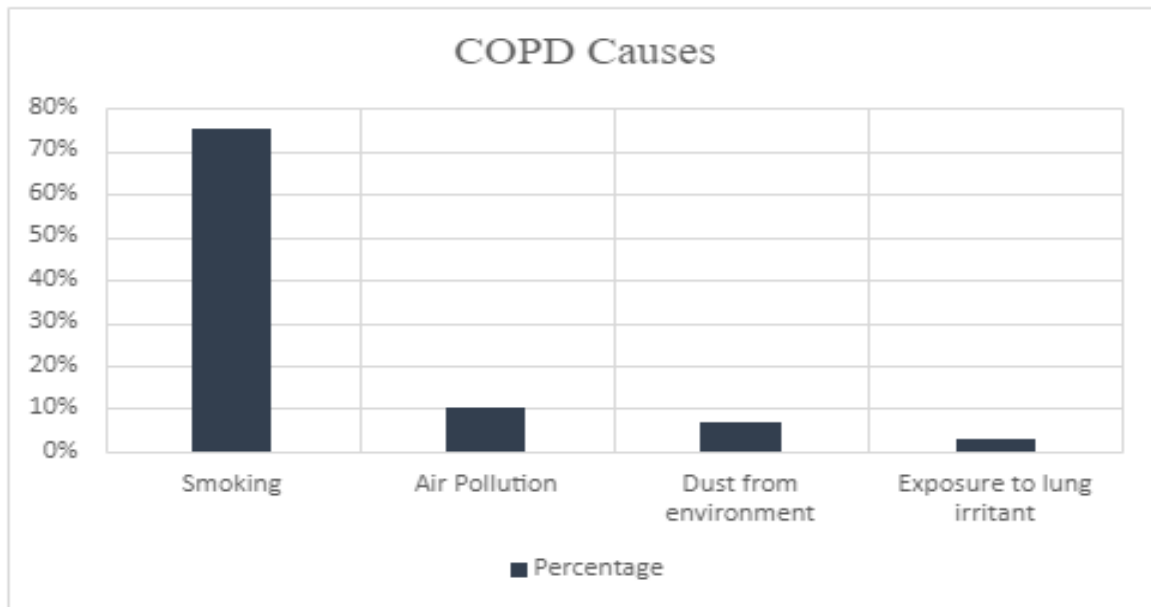
- i. Mucus/Cough**
- ii. Wheezing**
- iii. Shortness of Breath**
- iv. Chest Tightness**



Inference: The bar plot says that among all the common symptoms of COPD, Mucus or Cough is the major symptom(70-80%), Next comes Shortness of breath(20%) and wheezing and chest tightness ranges from 2-3%.

Q5. What are the primary causes for COPD disorders in patients:

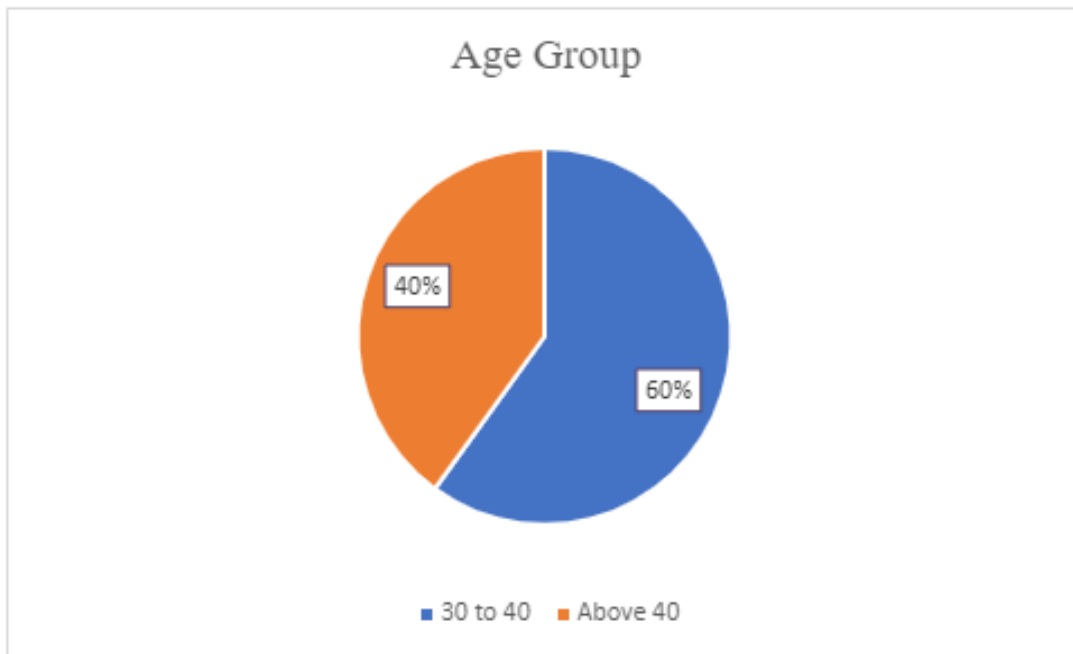
- i. Smoking**
- ii. Air Pollution**
- iii. Chemical Fumes or dust from environment or workplace**
- iv. Exposure to other Lung Irritant**



Inference: Smoking is the main cause of COPD (70-80%), next comes Air Pollution(10%), third is Dust from environment (3-5%), fourth is exposure to lung irritant(almost 2%).

Q6. Which age group patients show up more with COPD disorders?

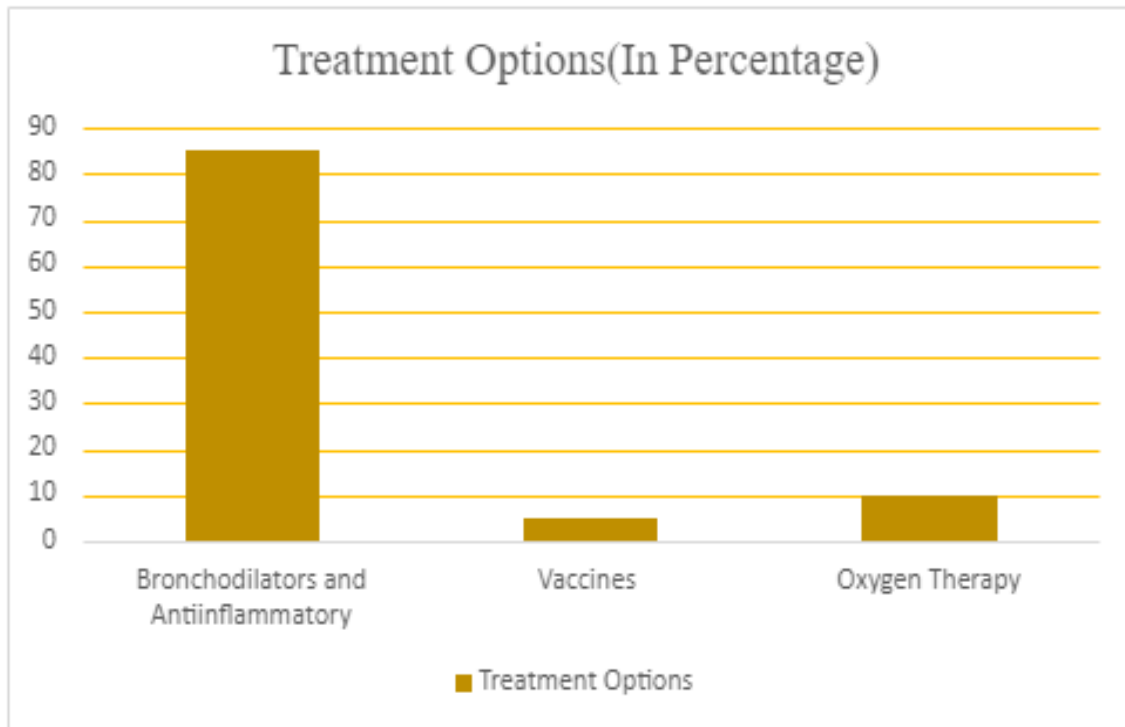
- i. 30-40 years
- ii. Above 40 years



Inference: 60% patient's age group is 30-40 years and 40% patients age is 40 years and more.

Q7. What are the various treatment options for COPD ailment?

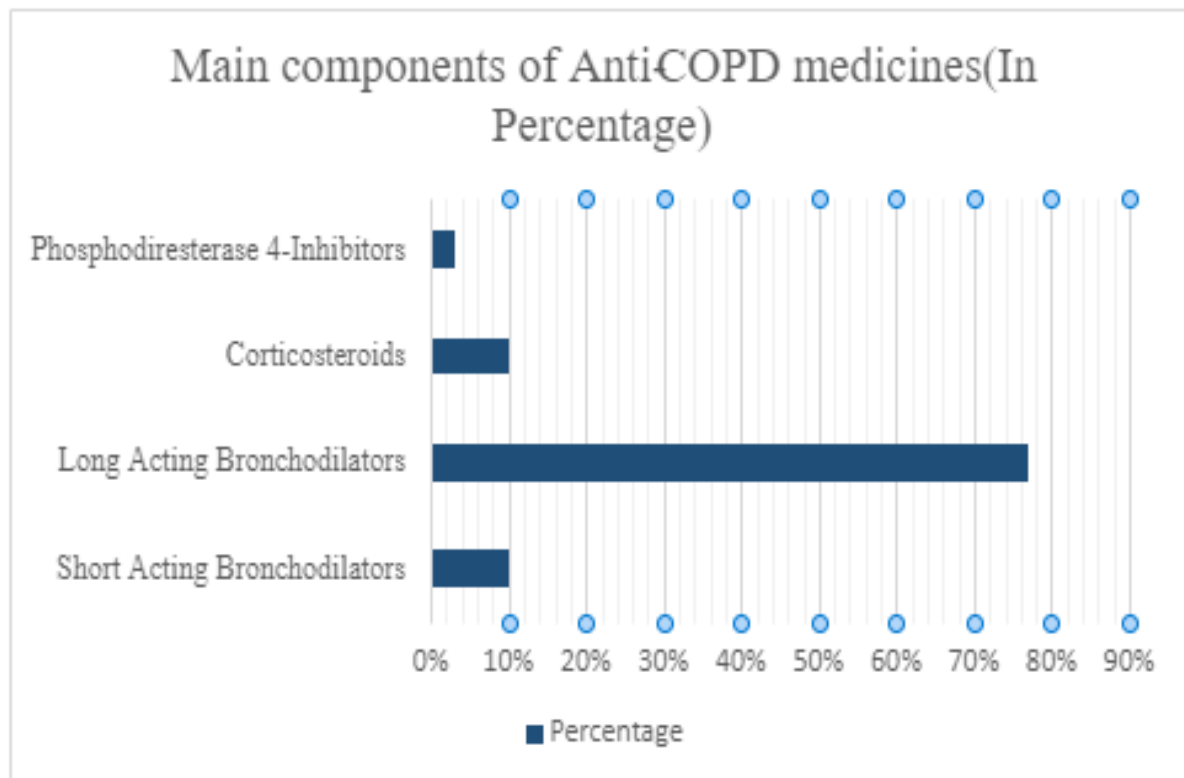
- i. Medicines such as Bronchodilators and Anti-inflammatory**
- ii. Vaccines**
- iii. Oxygen Therapy**



Inference: Bronchodilators and Anti-Inflammatory medicines are the most prescribed one's by doctors (almost 85%) ,oxygen therapy (10%) after which COPD are the vaccines 5%

Q8. What are main components you seek before prescribing an Anti-COPD medicine?

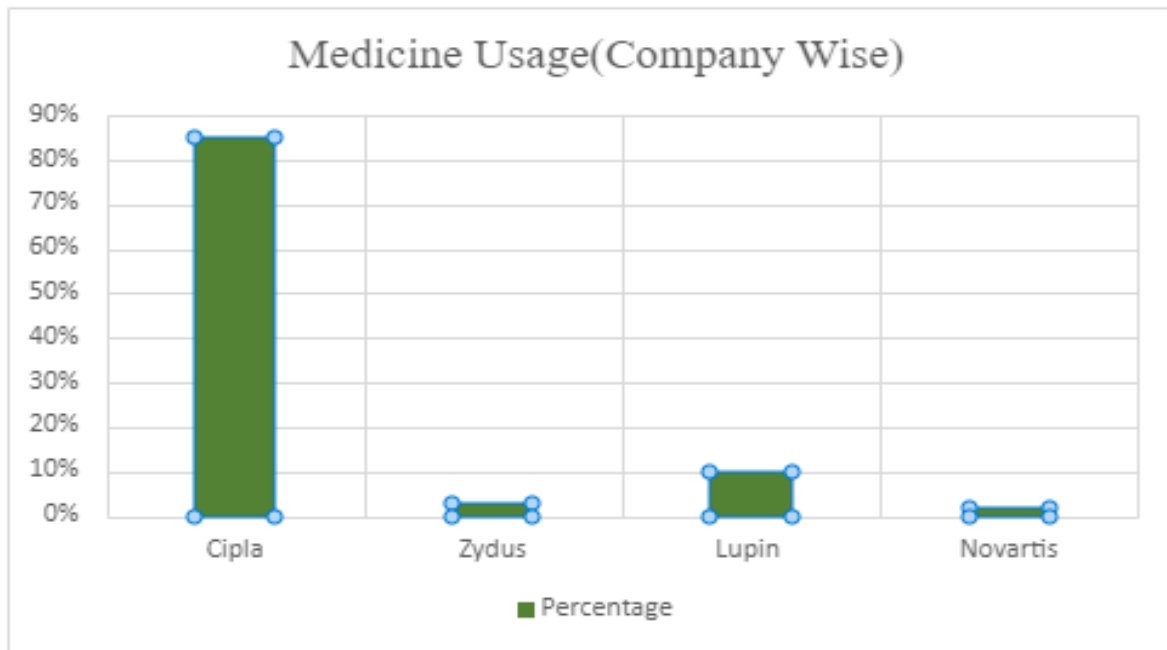
- i. Short Acting Bronchodilators**
- ii. Long Acting Bronchodilators**
- iii. Corticosteroids**
- iv. Phosphodiesterase-4 Inhibitor**



Inference: The above bar graph shows that almost 80% of doctors believe Long Acting Bronchodilators to be the best medicine for COPD and do prescribe that. Next in the run almost 10% doctors seek for Short Acting Bronchodilators and Corticosteroids each as Anti-COPD medicine. But Phosphodiesterase 4-Inhibitors are prescribed the least (almost < 5%) by the doctors.

Q9. Which is the most prescribed Anti-COPD medicines among the following:

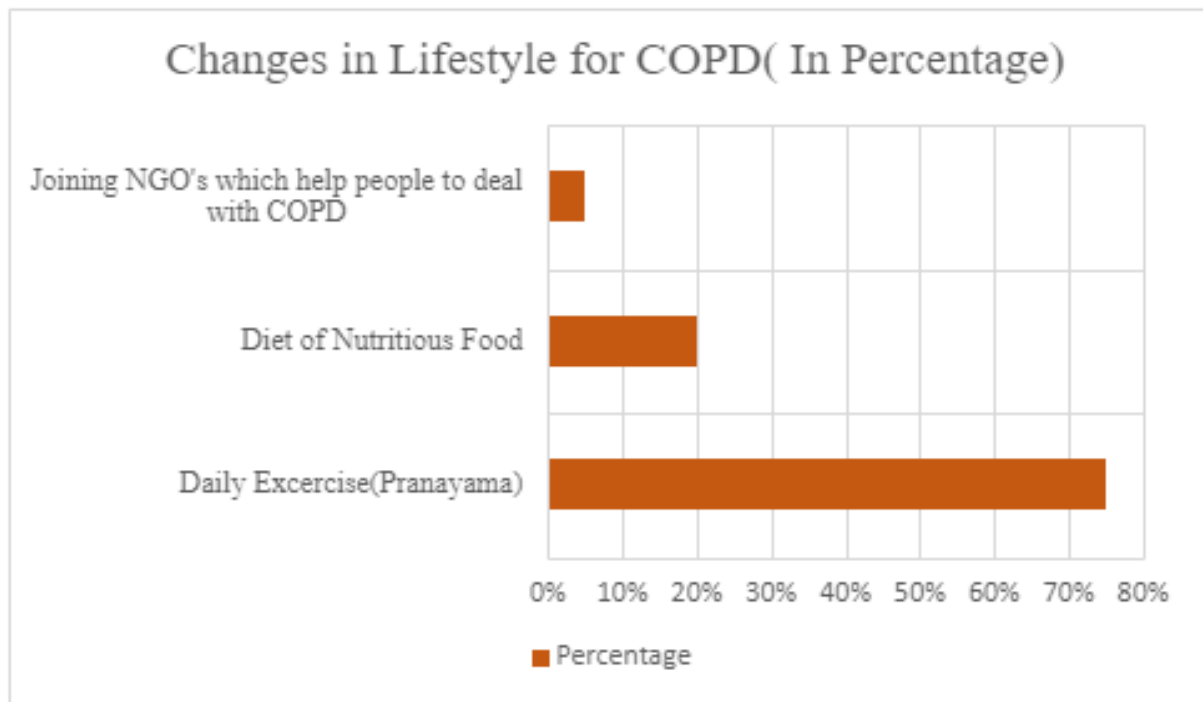
- i. Tiova, Triohale and Glycohale-F by Cipla**
- ii. Tiomist, Tioform by Zydus**
- iii. Tiate Transhaler, Tiomate HFA, Trimium by Lupin**
- iv. Sequadra, by Novartis**



Inference: Cipla's medicines are the most prescribed by doctors(80-85%), next to it is Lupin (10%), Zydus come after that with 2-5% and Novartis has the least popularity among doctors with almost 2%.

Q10. Apart from medication what all lifestyle changes can help in COPD management?

- i. Daily Exercise (Pranayama)**
- ii. A diet of nutritious food**
- iii. Joining NGO's which help people to deal with COPD**



Inference: The bar plot shows that apart from medications 70-75% doctors advices Daily exercises (Pranayama) to COPD patient, next almost 20% doctors ask patients to have a proper blend of nutritious food in their diet and lastly almost 5% doctors think that if patients join any organisation for people living with COPD could actually help patients suffering from that.

Conclusion

According to the survey conducted it is observed that there is much prevalence of COPD in these states of Rajasthan i.e., Jodhpur, Bhinmal and Pali. Keeping this picture in mind the survey further states the usages of medicines as Anti-COPD medicines and those that are Beta Adrenergics are found maximum in the medicines offered by CIPLA (almost 80%), next prevalence rate of ANTI-COPD medicine is by LUPIN(almost 10%), remaining is by Zydus and Novartis.

The most extreme manifestations of COPD have being shown in the figures and diagrams.

From the above review we can conclude that COPD is more common in people above the age of 40 years.

The questionnaire utilized for the study is mentioned herewith.

LIMITATIONS:

- Doctors were reluctant to respond because of the ongoing crisis scenario.
- They didn't have enough time to fill in the questionnaire that is being provided.
- The ongoing pandemic situation made it difficult to collect primary responses so the time taken was more.
- Unavailability of the doctors at the said time made the response collection a bit tedious.

Recommendations:

- Keeping in mind the current scenario doctors said that the use of mask by COPD patients may aggravate the level of carbon dioxide in them.
- COPD patients should take serious precautions during this pandemic scenario.
- The extent of COPD in the districts of Rajasthan is consistently increasing.

Annexure

1. Speciality of Doctor:
2. Place:
3. How many patients with COPD disorder visit your clinic per day?
 - i. 5-10
 - ii. 10-20
 - iii. More than that
4. What are the major symptoms shown in any COPD patients:
 - i. Mucus/Cough
 - ii. Wheezing
 - iii. Shortness of Breath
 - iv. Chest Tightness
5. What are the primary causes for COPD disorders in patients:
 - i. Smoking
 - ii. Air Pollution
 - iii. Chemical Fumes or dust from environment or workplace
 - iv. Exposure to other Lung Irritant
6. Which age group patients show up more with COPD disorders?
 - i. 30-40 years
 - ii. Above 40 years
7. What are the various treatment options for COPD ailment?
 - i. Medicines such as Bronchodilators and Anti-inflammatory
 - ii. Vaccines
 - iii. Oxygen Therapy
8. What are main components you seek before prescribing an Anti-COPD medicine?
 - i. Short Acting Bronchodilators
 - ii. Long Acting Bronchodilators
 - iii. Corticosteroids
 - iv. Phosphodiesterase-4 Inhibitor

9. Which is the most prescribed Anti-COPD medicines among the following:

- i. Tiova, Triohale and Glycohale-F by Cipla
- ii. Tiomist, Tioform by Zydus
- iii. Tiate transhaler, Tiomate HFA, Trimium by Lupin
- iv. Sequadra, by Novartis

10. Apart from medication what all lifestyle changes can help in COPD management?

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- iii. Joining NGO's which help people to deal with COPD

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