



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 10, Issue 5 - V10I5-1227)

Available online at: <https://www.ijariit.com>

Case Study- Chronic Obstructive Pulmonary Disease

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) and is associated with worsened clinical symptoms and prognosis. The prevalence of PH-COPD is not concretely established as classification criteria vary historically, but the presence of severe disease out of proportion to underlying COPD is relatively rare. Right heart catheterization, the gold standard in diagnosis of PH, is infrequently performed in COPD, and the overlap in the clinical symptoms of PH and COPD presents diagnostic challenges. Proven treatments are limited. Trials exploring the use of vasodilator therapy in this patient group generally demonstrate improvements in hemodynamic accompanied by worsening gas exchange without clearly demonstrated improvements in clinically meaningful outcomes. In-depth workup of underlying pulmonary hypertension and use of pulmonary vasodilator medications may be appropriate on an individual basis. We present a case study and a review and discussion of the pertinent literature on this topic. Chronic obstructive pulmonary disease (COPD) is a very common condition especially found among those of the older generation who have a history of smoking, a widely accepted practice where harmful effects were not known in the 1940's, 1950's, and even the early 1960's (Cummings & Proctor, 2015). The long-term effects of smoking were eventually understood in the scientific community as people would present with cases of diminished lung function. The risks were published and shared with the public as the medical community better understood the phenomenon (Cummings & Proctor, 2015). After the effects of smoking on lung function became better understood, treatments were devised and experimented to help improve respiratory status. Reactive airway disease and its treatment also played a role in the development of treatment for those who had the condition labeled as chronic obstructive pulmonary disease (COPD). Some of the treatments that were developed were in the classes of medications labeled as beta 2 agonists, anticholinergics, also known as muscarinic receptor antagonists, and corticosteroids. Each agent demonstrates a specific modality to help improve air exchange in individuals whose lung function has been compromised by bronchoconstriction, the lack of functional alveoli, airway inflammation, and excessive sputum production. Here presents a case of a 70 year old female who has a history of smoking of unknown duration and presents to the family medical provider with a cough. Subsequent is a review of recently approved FDA treatment for COPD utilizing CINAHL, Pub Med, and Cochrane databases searching under the terms Breo, Trelegy, LAMA, LABA, and ICS therapy in COPD.

KEYWORDS: COPD, Chronic Obstructive Pulmonary Disease, Pulmonary Hypertension

1. BACKGROUND

The history of *Chronic Obstructive Pulmonary Disease (COPD)* spans several centuries, with advancements in understanding, diagnosing, and treating the disease.

Early Observations:

***Ancient Times*:** Early references to symptoms resembling COPD, such as chronic cough and difficulty breathing, can be found in ancient texts. Hippocrates (460–370 BCE) described conditions like "dyspnoea" (difficulty breathing), though the concept of lung disease was not well understood at the time.

17th to 19th Century:

1679:** The term "emphysema" was first used by Swiss anatomist ***Theophile Bonet to describe lungs that were overinflated and damaged.

***19th century*:** Physicians began to differentiate between asthma, bronchitis, and emphysema. During this time, the harmful effects of air pollution on respiratory health were noted, especially during the Industrial Revolution.

20th Century:

1920s–1930s: With the rise of cigarette smoking, the prevalence of chronic bronchitis and emphysema increased significantly, although the connection between smoking and COPD was not immediately understood.

1950s: British researchers, notably Sir ***Richard Doll***, established the link between cigarette smoking and lung diseases, including bronchitis and emphysema.

1960s*: The term "COPD" began to be used as a comprehensive term to describe the chronic airway obstruction seen in both chronic bronchitis and emphysema.

-Alpha-1 Antitrypsin Deficiency*: Discovered in the 1960s, this genetic condition was found to predispose individuals to early-onset emphysema, even in non-smokers.

Late 20th to 21st Century:

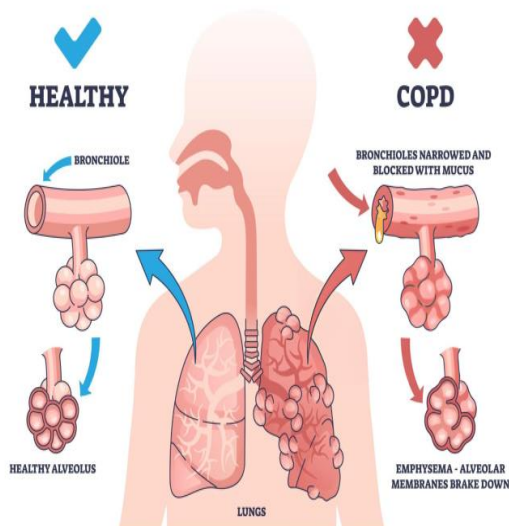
***1970s*:** The development of spirometry as a diagnostic tool allowed doctors to measure lung function, leading to better diagnosis of COPD.

***1990s*:** COPD was officially recognized as a major cause of morbidity and mortality worldwide, with smoking identified as the leading cause.

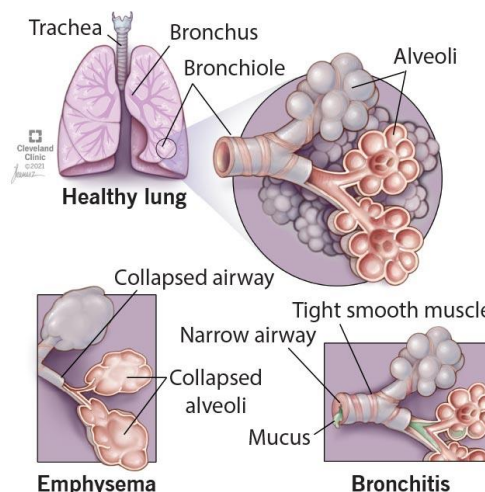
***2000s-Present*:** There has been increased awareness and education about COPD, leading to public health campaigns targeting smoking cessation. Medical advances, such as better bronchodilators, combination inhalers, and pulmonary rehabilitation programs, have improved disease management.

Today, COPD is a major global health concern, and ongoing research is focused on understanding its causes, preventing disease progression, and improving treatment outcomes. The role of genetics, environmental factors, and smoking continues to be central to our understanding of the disease.

The definition of COPD according to the American Thoracic Society (ATS) and the European Respiratory Society (ERS) is cited as a condition of limited airflow that cannot be completely reversed (Celli et al., 2014). The condition gradually progresses, being associated with chronic inflammation due to noxious gases and/or particles such as occurs with smoking, which is the most common risk factor (Celli et al., 2014). Other risk factors include public noxious gas emissions and the presence of alpha1-antitrypsin deficiency (Celli et al., 2014). In COPD cholinergic mechanisms are associated with smooth muscle contraction in the form of bronchoconstriction which takes place along with the inflammatory responses in the airways. These phenomena are the primary targets of inhalation therapy that is generally recommended for patients with COPD (Buels & Fryer, 2014)



Chronic Obstructive Pulmonary Disease (COPD)



2. CASE STUDY

Patient 70yrs old female came in emergency with Known case of Diabetes Mellitus & Hypertension since last 4 years, also has comorbidity of chronic obstructive pulmonary disease (COPD). She is more after admitted in our hospital become of her health-related conditions and a regular patient. At home she takes a number of medications, especially in case of COPD & Diabetes &

Antihypertensive drugs. Patient Rukma Devi Came in emergency department with complaining of severe Respiratory distress with gasping pattern breathing with swatting, in very critical condition. The Medical officer in the emergency department conducted a physical examination which revealed signs of critical condition as saturation of oxygen is 30% on Room air & heart rate also 50/min. & Blood sugar was also high. As patient was in critical condition medical officer called Consultant Critical care and explained All critical condition & poor prognosis fully explained to relatives by medical office and consultant in emergency & all critical consent taken After consent taken & Pt was immediately intubated & put on Bains Circuit ventilation support & shifted to ICU & also put on vasopressor support for hypotension. & patient put on mechanical ventilatory support in critical care unit the Medical officer in ICU discussed whole critical condition with chest physician & advices Lab Investigations, HRCT chest & chest X-Ray, routine Blood tests -CBC, sugar, HbA1c, LFT, RFT, HIV I & II, HBsAg, T3 T4 TSH, CPKMB, TROPT, ABG, Urine ketone, Pronp, CRP, along with USG Abdomen & pelvis & 2D echo, all done which showed an elevation in her Blood sugar level and raised creatinine & raised TLC counts, raised blood potassium level to work more harder due to her existing infections, with very critical condition. The medical officer in ICU observed that patient urine output decreased & nil for last 2 to 3hrs, immediately discussed with critical care specialist & Diuretics were given & patient investigations suggestive of Diabetic Ketoacidosis with septicemia with AKI & Cholelithiasis thereby the concerned doctors treatment plan charted, with IV Antibiotics, Antiplatelet, bronchodilators, nebulization with hyperkalaemia correction drugs were given along with IV fluids and & Insulin infusion for high blood sugar level. & all criticalness explained to relatives, consent taken & on Day 3rd patient seen lay critical care specialist concern doctor & ordered plan of weaning of from ventilatory support further trial for T-piece after Stabilization, patient fully conscious, obey verbal command & all vasopressors support day by day TAPERED ON & off. Patient general condition was steadily improving with improvement in arterial blood gas reports and sugar were normal and patient was managed with conservative medical management. But on the day VII th morning Rukma Devi pt had suddenly Abdomen fullness & tender signs present, examined by junior doctor about per abdomen and this symptoms, potentially indicated subacute intestinal obstruction, thereby the concerned doctor were forced to address by Regus present, Obser examinee Junior doctor about per Andaman & this symptoms, potentially indicated Pub Acute Intestinal obstruction thereby the concern ductions were forced to address the existing condition by ordering Gastroenterologist opinion and order for X-Ray Faceplate Abdomen & further pt continuous Ryles tube Aspiration & PR flatus tube passed & pt stabilized further & also pt seen by Nephrologist for AKI management as advised charted. After ensuring that Mrs. Rukma Devi was stable, the overnight care team reviewed the chart & the medication history records & patient further extubated & pt Stabilized & management with supportive treatment, orally allowed, CRTS removed, all vasopressor, gradually tapered & off and All ICU care and monitoring with regularly critical care specialist & physician & Gastroenterologist along with daily physiotherapy were given and patient improved gradually & further discharged after 17 days in the hospital in stable condition with medications oral as advised. After week and 15 days follow up we found patient is more stable and gradually improved walk and daily activity, blood glucose level down and now under control worth oral medicine. she doing regular pulmonary exercise, spirometry and precaution of dust and other pollen.

3. CONCLUSION

It's a Case of 70 year old female having COPD with History of Diabetes Mellitus & Hypertension since last 4 years reported in Emergency Department with critical condition where assessed and the Intubated to maintain Airway breathing and circulation by ventilator and vasopressor then shifted to ICU where further evaluated and treated by Mult speciality approach for 17 days and then discharge with stable condition and home medicining and health advice instructed .

FUNDING

Not Received any fund for this review.

CONFLICTS OF INTEREST

None of the authors disclose any conflicts of interest, either real or perceived.

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