Chapter 129

General care for patients with chronic obstructive pulmonary disease in intensive care

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1 INTRODUCTION

This study focuses on the discussion about the nursing care provided to patients with Chronic Obstructive Pulmonary Disease (COPD) in intensive care. COPD is understood as a change in the sending of oxygen in the airways toward the lungs. This alteration compromises the functions of the lungs causing diseases such as chronic bronchitis, and obstructive bronchiolitis, due to its inflammation, to further damage the pulmonary structures, as well as the production of substances harmful to the individual's health (1, 2).

Pulmonary Disease Chronicbstrutiva can be diagnosed through its most diverse signs ranging from wheezing, which are noises caused during breathing, in which there is a decrease in the size of the bronchi, during constriction. Other signs presented are cough and dyspnea during respiratory effort, the latter being the most severe stage of the disease, in which there is the greatest loss of lung functionality that consequently causes the lowest air transport capacity (1).

This disease also causes a decrease in the elasticity of the lung hindering the respiratory process, which is characterized by external breathing, the absorption of O_2 from the whole body (pulmonary respiration, internal respiration, the exchange of gases between cells and their liquid medium (cellular respiration) (3).

The causes of this disease, in addition to genetic inheritance, are related to sedentary lifestyle, smoking, socioeconomic aspects, such as sanitary conditions where the sick live, and pollution of large

population centers (4). According to studies, in underdeveloped countries, such as Brazil, women who are exposed to smoke from burning firewood for cooking food are more likely to develop the disease (5).

COPD is one of the three main causes of death in the Brazilian region, which affects about 40,000 people annually (1). In 2010, approximately 141,994 hospitalizations were recorded, in which a total of 778,428 days of hospitalization were required for the treatment and recovery of patients, which cost R$ 92.4 million. COPD was also responsible for 7,937 deaths due to this disease (6).

Between 2016 and 2018, approximately 345,527 people were hospitalized in Brazil, diagnosed with Chronic Obstructive Pulmonary Disease, and it is necessary to stay at least six days in Intensive Care Units (6). These hospitalizations cost the public coffers more than R$ 287,168,494.88, in addition to a mortality rate of 7.63 people per thousand inhabitants, in which the southeast region has the highest percentage of deaths accounting for 9.3% of its population. This high mortality rate may be related to the climate, and especially to the high level of pollution found in large population centers, such as São Paulo (6).

Among the victims of this mortality, a percentage are old people who have some characteristics associated with the onset of COPD, such as nutritional status, and cardiovascular and chronic diseases, such as osteoporosis (7). Depression and diabetes are also collaborators in the onset of the disease that requires medical follow-up since it presents symptoms that are also presented by other diseases, such as cardiovascular diseases (7, 8).

Thus, it is necessary to make the diagnosis of the patient with suspected obstructive pulmonary disease, through spirometry that evaluates the functions of the lung and the measurement of its volume and capacity, in addition, to flow rates and gas exchange, accompanied by chest X-ray (9).

With the advent of computed tomography, the diagnosis of Chronic Obstructive Pulmonary Disease became faster and more conclusive, given its efficacy during the procedure that reveals in a short time the presence and quantification of air accumulation. This detection allows the visualization of the process of inflammatory deterioration of the lung and consequently of the state of the stage of the disease. Computed tomography also has a greater power to detect the reduction of pulmonary volume that occurs by comparing the volume of a normal lung with another that presents the symptoms of chronic obstructive pulmonary disease (10).

The justification for the research that gave support to this study is due to the interest in knowing the care to help the recovery of patients with comorbidity of Chronic Obstructive Pulmonary Disease, who are being treated in an Intensive Care Unit, to leave the unit and have a better quality of life after returning home.

Considering the above, it is necessary to answer the research's guide question: What is the evidence in the literature on general care for patients with Chronic Obstructive Disease in intensive care?

1.1 HYPOTHESIS

General care for patients with Chronic Obstructive Disease in intensive care is diverse and contributes to clinical improvement and comfort.

1.2 GENERAL AND SPECIFIC OBJECTIVES

Analyze what care should be applied to a patient with Chronic Obstructive Pulmonary Disease in intensive care. Identify in the literature the general care for patients with Chronic Obstructive Disease in intensive care.

1.3 TYPE OF STUDY

The type of study is a literature review of works that address the theme of Chronic Obstructive Pulmonary Disease. For this, these works were recovered from research and publication sites such as Scielo, Google Acadêmico, sites Health Journals, such as Revista Brasileira Clínica Médica, and Revista Hospital Universitário de Pernambuco among others.

2 GENERAL CARE FOR PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: CARE IN THE INTENSIVE CARE UNIT

The performance of general care for patients with Chronic Obstructive Pulmonary Disease, through nursing care, favors their recovery, because the nurses responsible for the Intensive Care Unit assist these patients both in oxygenation therapy and therapies that aim to improve breathing as well as respiratory exercises (11). There is also general care, performed by nurses specialized in respiratory nursing in charge of assisting patients, who make treatments and Basic Health Units, as a way to avoid a worsening of respiratory problems and consequently their hospitalization (12).

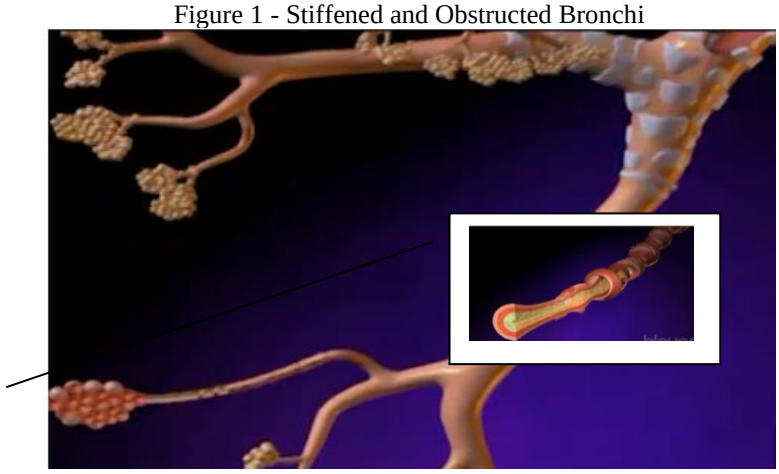
The concern to avoid hospitalization of patients with chronic obstructive pulmonary disease is to reduce the mortality of these patients, since 10% of those hospitalized die due to the debilitation of the health of this individual who during the year had several crises. Of the number of hospitalized patients who are discharged, 50% will have another crisis, in six months, which will lead to hospitalization again, further aggravating the physical conditioning of these hospitalized people and the increase in hospital expenses (13).

In such cases in which individuals already have Chronic Obstructive Pulmonary Disease, treatment to relieve pain and pressure in the pulmonary region can be done through the dilator broncho that will act directly in combating inflammation of the bronchi, which are stiffened due to the creation of collagen during the process of defense of cells, neutrophils, and macrophages, producing proteases, dilating them to facilitate breathing and better absorption of O_2, figures 1, 2 and 3, respectively (13). This procedure does

not solve the problem of the disease, since it is an irreversible condition, but it will contribute to a better quality of life for the patient (13).

In Figure 1, p. 11, we have the illustration of part of the bronchus obstructed by its internal healing due to inflammations in which the protective cells produced collagen to regenerate this area. However, this regeneration does not contribute to the improvement of breathing, on the contrary, there is difficulty in releasing CO_2 during expiration, to concentrate this substance inside the lung.

Figure 1 - Stiffened and Obstructed Bronchi



Source: Video: Bronchodilators - Manual MSD Health Version for the Family (msdmanuals.com). (Adapted by the authors).

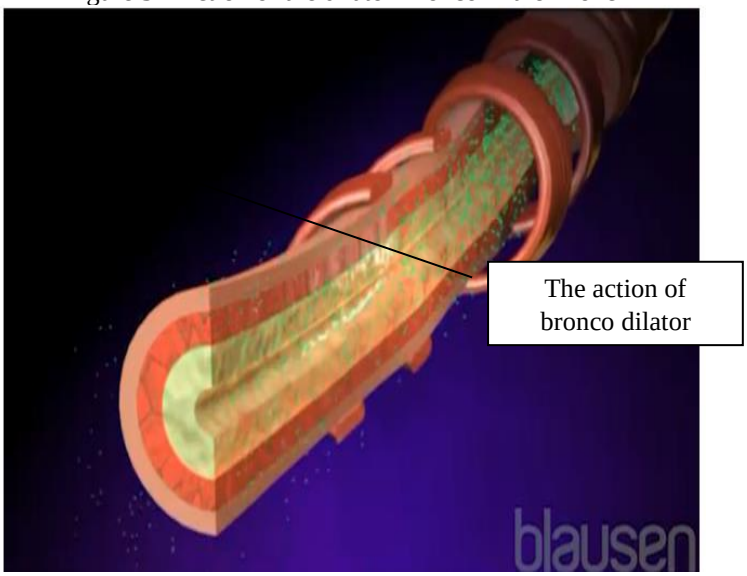
In Figure 2 p. 11, we have the process of dilation of the bronchi with the help of bronchodilators, such as anticholinergics and beta-2 agonists, which are inhaled by the airways being sent to the bronchi and joining their cells to dilate them and reduce the amount of secretion housed in this region and thus favor the breathing process (14).

Figure 2 - Action of the dilator Bronco in the bronchi

Source: Video: Bronchodilators - Manual MSD Health Version for the Family (msdmanuals.com). (Adapted by the authors).

In Figure 3, p. 12, the observe used the action of broncho dilators on the affected region, expanding it to facilitate the entry of oxygen into the lung and the output of CO_2.

Figure 3 - Action of the dilator Bronco in the Bronchi



Source: Video: Bronchodilators - Manual MSD Health Version for the Family (msdmanuals.com). (Adapted by the authors).

Another complicating agent in the patient's health, with Chronic Obstructive Pulmonary Disease, is its exacerbation as a result of a bacterial infection that generates increased dyspnea and phlegm, in addition to a respiratory rate above 30, in which this individual tends to seek more frequently an emergency unit to alleviate these bouts of shortness of breath (15,16). For this type of occurrence, the health professional should administer medications, such as β2 agonist, and short-term drugs, such as fenoterol, which will act on the sympathetic nervous system to try to dilate the respiratory tract and thus promote a better respiratory process (16).

Noninvasive ventilation is also a form of effective care for individuals with COPD, because it allows the patient to receive oxygen without having to perform endotracheal intubation and expose this patient to risks of contracting health problems, such as oropharynx traumas, among others. To perform the noninvasive mechanical ventilation procedure, some types of use are used, such as the nasal mask, nasal mask, and total facial mask. In addition, it is also widely used for the administration of continuous positive pressure in the airways, which is configured as the use of a single level of pressure in the two respiratory phases and the use of ventilation in two pressure levels (17).

Therefore, the use of these procedures by health professionals in the emergency center may allow the improvement of the patient's dyspnea to mitigate the exacerbation of Chronic Obstructive Pulmonary Disease.

3 GENERAL CARE FOR PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: ELECTRICAL STIMULATION AND OXYGEN THERAPY

The use of Electrical Stimulation or Transcutaneous Electric Diaphragmatic Stimulation aims to gather and train the largest amount of healthy muscle fibers in the lung region to re-perform contraction movements, lost with the stiffening of the bronchioles due to the large accumulation of collagen, to avoid atrophy of the pulmonary musculature. The use of electrical stimulation may also favor the return of respiratory activities after the removal of the artificial ventilatory system since during its use the lung muscle fibers were continuously exercised (18).

The process of Electrical Stimulation consists of the rhythmic stimulus of the short duration of the diaphragmatic region through surface electrodes to alter the intrapleural pressure making it more negative and thus contributing both to natural ventilation and the return of cardiac output (19). Thus, it is understood that Electrical Stimulation performs the function of pulmonary muscular physiotherapy, while it allows the patient to breathe, but also promotes both the preservation of muscle fibers, not affected by the disease and respiratory restoration (20, 21).

In addition to Electrical Stimulation, we also have oxygen therapy which consists of a procedure used to prevent hypoxia of lung tissues in addition to maintaining oxygenation of cells and preserving the respiratory and vital functions of the individual. For this, oxygen therapy will focus on maintaining and balancing blood oxygen blood pressure (PaO_2) greater than 60 mmHg and peripheral oxygen saturation below 90% (22). Therefore, the use of oxygen therapy is of paramount importance for reducing the intensity of diseases such as COPD in Intensive Care Units (11).

The oxygen therapy procedure consists of the use of oxygen supplementation to treat and increase blood oxygen levels (hypoxemia) which may be below normal, which is 90%. The existence of hypoxemia in an undue may result in cardiac complications and the emergence of diseases such as asthma, pneumonia, anemia, emphysema, bronchitis, apnea, and Chronic Obstructive Pulmonary Disease. To assist in the normalization of the level of blood oxygenation, supplemental oxygen should be used through the use of a "Venturi Mask", which has a greater power of oxygen supplementation, or through a catheter, which despite not having the same precision of this supplementation as the "Venturi Mask", is better accepted by patients (11).

4 CONCLUSION

General care for patients with Chronic Obstructive Pulmonary Disease in intensive care is diverse and contributes to its clinical improvement. Among these cares, identified in the literature on patients with COPD, are the use of dilator broncho, which will act directly in combating inflammation of the bronchi, which are hardened due to the creation of collagen during the defense process of cells, neutrophils, and macrophages, producing proteases, dilating them to facilitate breathing and better absorption of O_2.

Another type of care to be applied to a COPD patient in intensive care through the administration of medications by the health professional, such as β2 agonist, and short-term patients, such as fenoterol, which will act on the sympathetic nervous system to try to dilate the airway and thus promote better breathing.

In addition to this care, we can also employ the electrical stimulation procedure that may favor the return of respiratory activities after the removal of the artificial ventilatory system, since during its use the lung muscle fibers were continuously exercised. This patient will also benefit from the use of oxygen therapy because it allows oxygen supplementation to treat and increase blood arterial oxygen levels (hypoxemia) that may be below normal, which is 90%.

Therefore, general care, such as electrical stimulation and oxygen therapy, performed correctly in the care of patients with Chronic Obstructive Pulmonary Disease in intensive care, can contribute favorably to their recovery through the restoration of muscle fiber movements and consequently the return of breathing without the help of this equipment.

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