

TRAUMATIC PNEUMOTHORAX: THE NURSE'S PERFORMANCE IN THE USE OF VALVE DRESSING

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Abstract: Open traumatic pneumothorax results from a penetrating injury through the chest wall that allows air to communicate between the atmosphere and the pleural space. The initial management consists of closing the wound with a quadrangular dressing, large enough to cover the entire length of the wound. This procedure aims to avoid any additional communication of air with the pleural space and is performed with the placement of an occlusive dressing adhered to the thorax with adhesive tape on three sides in order to allow a unidirectional valve. The role of nursing in this type of injury highlights the relevance of scientific knowledge that defends the professional's autonomy in handling the practices that establish the patient's level of progression, with the nursing professional being an integral participant in the care of the individual from the approach to the high of the same. Therefore, simple measures, such as the use of a unidirectional valved dressing in APH, allow for a lower incidence of deaths due to penetrating aspiration trauma.

Keywords: Trauma; Assistance; Management.

INTRODUCTION

The evident increase in life expectancy is due to technological advances that have given the opportunity to understand how the human body acts against chronic diseases and infections throughout life, however external factors continue to have a great impact on the number of deaths and consequently on public coffers. This comes, in most cases, from occurrences that are directed to reference emergency centers, whether they are mobile units, of high or intermediate complexity of a transitory nature, elucidating in the treatment of episodes that require quick action by the nurse. against the patient's imminent death (ZANDOMENIGHI et al., 2011).

According to Correa-Restrepo et al., 2020 chest trauma has morbidity and mortality

that occur in around 25% of cases, has a high incidence in the world and the fact is predominant in developed countries. Chest trauma can result in perforation of the pleura, the layer of epithelial and connective tissue that lines the lung, causing traumatic pneumothorax. This, in turn, represents the second most common injury in chest trauma, accounting for 50,000 cases per year in the United States (KOCH; HOWELL; KAHWAJI, 2021).

Traumatic pneumothorax can be triggered by accidents, whether car accidents, falling from a height or even handling weapons, resulting in FAB (Blade Weapon Injury) or FAF (Firearm Injury). It constitutes a clinical emergency that requires immediate interventions. Its classification is based on the degree of displacement of the mediastinum and adjacent structures, which can be simple or hypertensive, as well as open or closed, as evidenced by the level of exposure of the respiratory structures and the place where the trapped air escapes (BOUZAT, 2017).

In open traumatic pneumothorax, the chest wall is injured with disruption of the integrity of the skin, which allows air to enter the intercostal space. If this hole is more than 75% in diameter when compared to the trachea, the air will preferentially pass through it, as it has less resistance. Therefore, the pleural cavity fills with air, thus reducing the space for lung expansion, thus unable to comply, the lung reduces its hematosis, which triggers hypoxia and hypoperfusion with aggravation of contralateral mediastinal displacement, converting pneumothorax opened in a hypertensive patient with evolution of incompetence of the pulmonary parenchyma (SBA, 2016).

The pathophysiology of open pneumothorax involves the instability of thoracic trauma patients, which may be associated with exsanguinating hemorrhages.

metabolic acidosis, the so-called Fatal Triad. Hypoxia and hypovolemia are correlated, as large-scale bleeding causes pressure changes, hypoventilation and hypoperfusion. The drop in serum oxygen levels leads to harmful consequences for aerobic cell metabolism, from which part of the vital function of organs and tissues comes, this is due to hypovolemia or the ineffectiveness of hematosi, as there is a decrease in blood volume and low supply of oxygen. oxygen, so there is a drastic drop in saturation and consequently ischemia of the structures (CASAGRANDE; MONTE; DIAZ, 2021).

Due to the decrease in lung compliance, hypercapnia (increase in carbon dioxide - CO₂) will be evident due to the impairment in the elimination process, therefore its concentration will be high, which leads to metabolic acidosis due to the repercussion of tissue hypoperfusion. Therefore, if the tissue does not receive enough oxygen, it does not perform vital functions, and necrosis is involved (ATLS, 2018).

Among numerous studies, there is improved evidence of dynamism in care with the presence of nurses in the APH. And over the years, there has been a growth in work with a progression of autonomy when it comes to nursing in advanced practices, thus reducing the waiting time for care, advancing in the quality of care and consequently reducing the mortality rate of those in need. of immediate interventions (MALVESTIDO et al., 2019). Since 1990, the integration of nurses into the team has become active within mobile care units and mandatory with regard to ALS (Advanced Life Support) units, also encouraging the participation of this professional in continuing education measures such as technical and pedagogical training (ADÃO; SANTOS, 2012).

The vital function of the APH encompasses the stabilization of the patient to the point

of tolerating transport from the mobile unit to the hospital unit immediately, therefore the use of a 3-point dressing is consolidated as a preventive management of tension pneumothorax, delaying the unfavorable prognosis and death in question of instants. In view of this, the use of this care strategy increases the patient's survival and allows pre-hospital care a safe transport to the high complexity unit (CALADO; LIMA, 2017).

The present manuscript permeates the nurse's performance in the face of open pneumothorax findings in the APH (Pre-Hospital Care) and the use of the valved dressing, as well as the impact on the survival of this type of patient until admission to the health care service. hospital emergency or of intermediate complexity, such as the 24h UPA (Emergency Care Unit).

OBJECTIVE

To analyze and describe the impact of the use of the 3-point dressing by the nurse in Pre-Hospital Care (APH).

METHODOLOGY

This article is a bibliographic review of studies, protocols and literature, whose purpose is to understand the use of some of the techniques for managing traumatic pneumothorax and the care provided by nurses in APH (Pre-Hospital Care) in the face of this type of trauma. The arsenal of documents is based on publications available in the MEDLINE database, on the National Center for Biotechnology Information (NCBI) and PUBMED portal, as well as on state protocols from the last 10 years on the subject.

THEORETICAL REFERENCE

Normally intrapleural pressure is negative when compared to atmospheric pressure. When the chest wall expands outward, the lung

also expands due to surface tension between the parietal and visceral pleurae. The lungs have a tendency to collapse due to pulmonary elastic recoil. When there is communication between the alveoli and the pleural space, air fills this space, altering the pressure gradient, equilibrium of the collapsed lung unit is reached or the rupture is sealed. The pressure gradient within the thorax changes with a pneumothorax, the lung becomes smaller due to this vital capacity and the partial pressure of oxygen decreases, leading to a decline in lung function.

Open or communicating pneumothorax is the result of a penetrating injury through the chest wall that allows air communication between the atmosphere and the potential pleural space. This leads to dysfunction when negative pressure forces produced during chest cavity expansion allow air to enter the pleural space. Instead of the normal negative pressure within the thorax, which is essential for ventilation, atmospheric pressure develops and impedes air movement. Unlike simple pneumothorax, open pneumothorax cannot lead to strain physiology as open communication allows air to escape when pressure rises beyond atmospheric pressure. Due to the effects of inspiration, this injury can still lead to respiratory failure unless corrected.

Atelectasis, also known as lung collapse, occurs in perforating pneumothorax due to the pressure exerted by the air that is present between the pleural tissue. Mostly it does not have specific symptoms, but it can be identified by the symptoms caused by hypoxemia such as dyspnea and cough according to its progression. When identifying such symptoms, it is indicated to perform a chest X-ray for a better diagnosis, in the result it will be possible to identify opacity in affected regions and a visible decrease in lung volume (ÇORUH; NIVEN, 2019; HOCHHEGGER et

al., 2021).

Initially, closure of the wound must be ensured, and this can be done temporarily with a sterile unidirectional valved occlusive bandage called a three-prong dressing. This allows the air flow to be unidirectional, reverberating from inside the pleural cavity to the external environment, preventing the opposite flow, which in a short time would lead to a tension pneumothorax due to the accumulation of air and consequently an increase in intrathoracic pressure (SESA, 2018; TONDO et al., 2021).

The initial management of open pneumothorax consists of closing the lesion, using a quadrangular dressing, large enough to cover the entire length of the lesion (MEDEIROS, 2015). This procedure in an aspiration thoracic wound, aims to avoid any further communication of air with the pleural space and is performed with the placement of an occlusive dressing in order to allow a one-way valve. The result must be a device that allows air to exit the pleural space without allowing air to flow back with inspiration. Classically, an occlusive dressing is applied and adhered to the chest with tape on three sides with a dependent portion open to allow air and blood to escape the wound. (KOCH; HOWELL; KAHWAJI, 2021).

Among the possible interurrences related to the management of the 3-point dressing, hemothorax, tension pneumothorax, ostium tamponade by blood clots, detachment of the edges of the dressing due to poor adhesion to the skin due to local hemorrhage, total occlusion of the dressing evolving to pneumothorax stand out. closed. After all, these are situations that the team is subject to suffer during pre-hospital care, therefore, it is crucial to control local bleeding, local cleaning of the skin with 0.9% saline solution in order to reduce dirt and improve adhesion of the edges, the installation of the

dressing correctly, with effective fixation of 3 of the four edges, as well as the recurrent evaluation after the procedure is carried out as a way to guarantee its effectiveness (KOCH; HOWELL;KAHWAJI, 2021; HORMIS ; STONE, 2016).

The role of nursing in this type of injury highlights the relevance of scientific knowledge that defends the professional's autonomy in handling the practices that will establish the patient's level of improvement, with the nursing professional being an integral participant in the care of the individual, from the approach to the discharge of the same (SILVA et al., 2021).

The nurse in the APH plays a fundamental role in the team, but has acquired greater importance after its regulation by COFEN in 2011. The performance of nursing activities permeates the tasks of assistance, supervision, organization and management of resources human beings, of the communication between the team, as well as the resourcefulness of their theoretical knowledge and practical experiences with the focus of contributing so that the other professionals act according to the recommended protocols in favor of the patient and the safety of their own team and work (NOGUEIRA, CORAZZA, 2021; MALVESTIO et al., 2019).

Although there are no real data on the use of dressings, it is known that the incidence of death due to tension pneumothorax is high, ranging from 4 to 8% in isolated chest injuries, 10 to 25% when other organs are affected, reaching the rate of 35% when several systems are involved. Even though it is one of the main causes of death in pre-hospital care, 85% of patients with tension pneumothorax could receive effective assistance with just analgesia, ventilatory support and chest drainage, without the need for major surgical intervention. Therefore, simple measures such as the use of a unidirectional valved dressing in

APH allow for a lower incidence of deaths due to penetrating aspiration trauma (REDIVO, CORTEZ; PEQUENO, 2018).

CONCLUSION/FINAL CONSIDERATIONS

With the perspective of improving the management of open traumatic pneumothorax, the importance of approaching the patient in an agile and resolute manner is highlighted, in order to stabilize him for transport and prevent the harmful evolution of the clinical condition. Therefore, the use of valved dressing configures a nursing practice based on scientific evidence that aims to increase the individual's survival and facilitates his/her arrival at the high complexity reference unit.

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