# 149 - EPIDEMIOLOGICAL PROFILE OF PATIENTS UNDERGOING INVASIVE MECHANICAL VENTILATION IN INTENSIVE CARE UNITS FROM MACEIÓ.

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## INTRODUCTION

During the 1950s, the development of mechanical ventilation has led the organization of respiratory intensive care units (ICU) in several European and American hospitals.

In Brazil, the ICU began in the 70s, in order to maintain and develop the multidisciplinary team specialized, providing intensive care, monitoring of vital functions of the patient, allowing correction of any changes (Azeredo, 1964, and Pope, 2000) . The ICU admissions fall into two categories: critically ill patients, who have vital aggravating disorders that can cause death, and high-risk patients, which although it has been clinically stable, may develop abruptly organic changes that complicate your frame ( POPE, 2000).

Complications in clinical patient are related to the underlying pathology, however, mechanical ventilation itself is linked to this type of problem, because when we instituted an endotracheal intubation, or nasotracheal intubation, there is likely to generate difficulties with speech, increase in infectious airway, airway injury, barotrauma, physiological changes, as well as hypertension, tachycardia and glottal spasm (David, 2000; Martins, 2000). In the past decade, has recognized the potential risk of mechanical ventilation to produce morphological and physiological changes in pulmões.Os findings related to the mechanical ventilator induced lung injury, does not differ from those found in SARA (WARNER, 1996).

The injury causes changes in pulmonary surfactant, increased permeability and massive loss of aeration (Dreyfuss, 1988). Among the mechanisms that lead to lung injury include: the high pressures of alveolar distension, which are related to the existence of high pressures or volumes and end-inspiratory alveolar pressure falls (Whitehead, 2002).

There is evidence that the injury induced by the fan, can result in release of mediators, including cytokines. These mediators and endotoxins or bacteria can enter the systemic circulation and cause dysfunction of some organs and ultimately, multiple organ failure (WARNER, 1996).

Sepsis is the leading cause of death in intensive care units (ICU) and is among the leading causes of death in the U.S.. Around 2% to 11% of hospital admissions in the ICU and are by this disease (Angus, 2001). The observed average age (62 years) and predominantly male is a constant in all studies. There is a trend to increased age and a difference that little has changed in relation to gender. When analyzing the evolution of organ dysfunction, has been the evolution of the third day of severe sepsis and septic shock seems to be a milestone that a tendency to discriminate death or not ($p < 0.001$) (SALES, 2006).

In a study by Gonçalves et al. (2006), we applied a form in many ICUs, where it provided information on the ICU, patient characteristics, data from mechanical ventilation and their signs, which were grouped into a relationship that included:

CM - coma: loss of consciousness secondary to organic or metabolic condition;

DNM - neuromuscular disease: disease of the peripheral nerve, myoneural junction or muscle, which was able to determine respiratory failure;

COPD - chronic obstructive pulmonary disease: clinical decompensation or exacerbation of bronchospasm, infection or heart failure;

ARI - acute respiratory failure: patients without restrictive or obstructive pulmonary disease prior to mechanical ventilation. In the case of the latter patients were classified according to the following subgroups:

BA - aspiration, defined as visualization of gastric contents into the airways, or in material aspirated from the trachea;

HF - heart failure: evidence of heart disease, dyspnea, and bilateral alveolar infiltrates on chest radiography;

PO - Post-operative: patients who came from the operating room intubated and still in need of mechanical ventilation in the postoperative period;

PN - pneumonia: Characterized clinically by the ICU physician, using methods clinical, radiographic and laboratory, as his jugamento;

ARDS - acute respiratory distress syndrome: defined according to the criteria of the American Consensus Conference - European in SARA (1994);

SE - Sepse-SIRS/Sepse/SIRS, Burn / Shock, Septic / SIRS: according to predetermined criteria of the Consensus Conference ACCP / SCCM (American College of Physicians / Society of Critical Care Medicine) for severe sepsis and septic shock;

TR - trauma: need for mechanical ventilation due to traumatic injuries to the chest, abdomen or skull.

In fact, more and more the site has been a source of respiratory infection process, which is compatible with an increasing number of patients under mechanical ventilation and prolonged hospitalization in intensive care units (SALES, 2006).

According Regenga (2000), assistance to critically ill patients had greatly increased and improved, with the advancement of medical specialties, technology and the creation of the Intensive Care Unit (ICU). These units aims to develop and maintain a specialized multidisciplinary team, all working together to provide intensive care and high quality, thus improving the condition of critically ill patients, which was admitted by several systemic lesions, some inherent to the aging process.

## METHODOLOGY

This is a retrospective, observational, descriptive, cross-sectional, quantitative, based on analysis of medical records of ICU'S general hospitals: Memorial Arthur Ramos and Santa Casa de Misericordia de Maceió, with the procedure, visits made weekly during the period July to December 2010 these institutions, the data being collected from patient charts, the period from January to December 2009 and completed the forms set out with the following information: age, sex, underlying pathology, a pathology that led to mechanical ventilation invasive, total hospitalization time, the individual's total time in hospital and invasive

mechanical ventilation.

The technique used was simple consecutive sampling. Statistical analysis was performed with an interval of 95% for each frequency found by the software Graphpad online (URL: http://www.graphpad.com) and the sample size set at 100 records. Patients with high evolution and death, in particular the study period, were also included.

**RESULTS AND DISCUSSION**

The survey sample consisted of analysis of medical records of 100 subjects, 62% of men (95% CI 52% to 71%) and 38% women (95% CI 29% to 48%). The distribution of the sexes according to the hospital was surveyed, 67% men and 33% for women in the Santa Casa de Misericordia in Macedonia and 60% of men and 40% women in Hospital Ramos.

Among the characteristics of the sample (Table 1), the average age was 67 years (95% CI 63 to 70 years), the mean length of stay, as well as invasive mechanical ventilation, respectively 16 days (CI 95% 14 to 18 days) and 7 days (95% CI 6 to 8 days). According to the data obtained we can observe that the percentage of males was higher than the female, which confirms data obtained in a study in Acre and Ceará (Acuña, 2007), where the percentage of males was also higher than the female. Thus it is assumed that man has a greater commitment on their systems due to their professional life activities, lack of care and some anatomical and physiological differences in relation to women. To further confirm the relationship of superiority in men, this relationship was also found in the epidemiological study of Mendonça and Silva (2008) which consisted of 56% of men, a total of 299 records studied.

Also according to data found in the study of the epidemiological profile of patients ventilated invasively by Costa (2006), the average age was 62 years, with invasive ventilation time of 6.9 days, thus showing a significant correlation with the data obtained in this study now developed. However Azeredo (2000) reveals that the time factor is not absolutely important, because it is impossible to determine the final withdrawal of the ventilator.

However as regards the number of days on mechanical ventilation, Generoso et al. (2005) show that the longer ventilation, greater impairment in respiratory muscle strength, ie, prolonged mechanical ventilation promotes changes in the diaphragm and these changes are dependent on the length of stay in the unit.

Table 1. Characteristics of the sample

| Variável | Média | IC 95% | DP |
|---|---|---|---|
| ***Idade*** | 67 anos | 63 a 70 anos | 17,63 |
| ***Tempo de internação*** | 16 dias | 14 a 18 dias | 10,79 |
| ***Dias em VMI*** | 7 dias | 6 a 8 dias | 6,31 |

The primary variable clinical findings (Table 2) showed a variable distribution, and the factors most fequentes pain, with 18% (95% CI 12% to 27%) tumors, with 17% (95% CI 11% to 26 %), lowered level of consciousness, with 16% (95% CI 10% to 24%) and respiratory infection, with 13% (95% CI 8% to 21%). The presence of isolated conditions, resulted in an "other" category with a total of 45% (95% CI 36% to 55%).

According to Costa (2006) the primary variable that she considered the underlying pathology, observed more frequently, and coronary stenoses were neoplasms, which somewhat confirms the results found in this study, where the tumors are a percentage of 17% , taking the second place of the clinical findings that more tubes.

Table 2. Distribution of clinical

| Variável | Frequência | IC 95% |
|---|---|---|
| ***Dor*** | 18% | 12% a 27% |
| ***Tumor*** | 17% | 11% a 26% |
| ***Rebaixamento do nível de consciência*** | 16% | 10% a 24% |
| ***Insuficiência Respiratória*** | 13% | 8% a 21% |
| ***Diabetes Mellitus*** | 12% | 7% a 20% |
| ***Acidente Vascular Encefálico*** | 12% | 7% a 20% |
| ***Hipertensão Arterial Sistêmica*** | 9% | 5% a 16% |
| ***Pneumonia*** | 9% | 5% a 16% |
| ***Hemorragia*** | 9% | 5% a 16% |
| ***Insuficiência Renal*** | 8% | 4% a 15% |
| ***Traumatismo Crânio-encefálico*** | 5% | 2% a 11% |
| ***Infecção respiratória*** | 5% | 2% a 11% |
| ***Dispnéia*** | 3% | 1% a 9% |
| ***Necrose*** | 3% | 1% a 9% |
| ***Outros*** | 45% | 36% a 55% |

By observing this study the most frequent pathology that led to mechanical ventilation, respiratory failure found, with 45% (95% CI 35% to 56%), being the second most influential factor to respiratory infection, with 25% (95% 17% to 34%). Just as the variable clinical findings, disease with only one isolated case of presentation resulted in a total of 60% (95% CI 50% to 69%), considering some examples: hepatic encephalopathy, pleural effusion, diffuse cerebral edema , sara, among others.

In a study by Gonçalves et al. (2006), the indications of mechanical ventilation, were grouped in a relationship of pathologies, which does not establish an order of criteria for ventilation and respiratory failure which was found as a factor for the same indicator.

Still on the causes of invasive mechanical ventilation installation, the study by Costa (2006), found a prevalence of 52% of cases due to respiratory depression due resulting from the anesthetic, 36% with respiratory failure, and 5% other causes. Son et al (2004) says that these causes may develop as consequences of existing basic conditions, drawn from the overall

physiological process, and further reinforcing the findings, David and Martins (2000) reported that the complications found in the patient's clinical, are related to the underlying pathology.

Finally, Emmerich (2000) describes in his study that patients with chronic diseases, it is essential to the use of artificial airways and consequently, prolonged use of invasive mechanical ventilation.

Table 3. Pathology that led to VMI

| Variável | Frequência | IC 95% |
|---|---|---|
| ***Insuficiência Respiratória*** | 45% | 35% a 55%* |
| ***Infecção Respiratória*** | 25% | 17% a 34% |
| ***Rebaixamento do nível de consciência*** | 16% | 10% a 24% |
| ***Sepse*** | 12% | 7% a 20% |
| ***Insuficiência Renal*** | 11% | 6% a 19% |
| ***Pneumonia*** | 7% | 3% a 14% |
| ***Edema Agudo de Pulmão*** | 6% | 2% a 13% |
| ***Choque hipovolêmico*** | 6% | 2% a 13% |
| ***Acidente Vascular Encefálico*** | 3% | 1% a 9% |
| ***Outros*** | 60% | 50% a 69% |

## CONCLUSION

In our study we found a profile of patients in ICUs surveyed consisting of: man, aged 67, with clinical findings most relevant, the first three on a scale of more frequent pain, tumor, and lowered level of consciousness, with an average of 16 days 7 days of hospitalization and invasive mechanical ventilation, with the latter as the main pathologies that led to the same: respiratory failure and infection.

This finding allows to organize the services of hospitals compared to patients in relation to care, prevention and intensity of them.

After the data obtained in this study, describing the epidemiological profile of patients undergoing invasive mechanical ventilation in intensive care units of Maceió, is expected to contribute to promote and expand information about the leading causes of hospitalization of the study population, as well as generate protocols service, means for enabling a more effective and safe treatment of the teams involved in the recovery of patients, but also gives professional quality in their performances.

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**EPIDEMIOLOGICAL PROFILE OF PATIENTS UNDERGOING INVASIVE MECHANICAL VENTILATION IN INTENSIVE CARE UNITS FROM MACEIÓ.**

**ABSTRACT**

The ICU`s has been defined as a health service for people who are in a serious situation, but they have a really good chance to recover, these people would be benefit by an clinic observation more detailed and an invasive treatment. The aim of this study was to identify what type of patient is subjected to invasive mechanical ventilation, to check the most frequent pathologies that lead patients to make use of it, and register the differences in private hospitals, regarding the patient profiles mechanically ventilated.

**KEY WORDS**: Epidemiologic Profile, ICU, invasive mechanical ventilation, respiratory failure.

**PERFIL EPIDEMIOLÓGICO DE PACIENTES SUBMETIDOS A VENTILAÇÃO MECÂNICA INVASIVA EM UNIDADES DE TERAPIA INTENSIVA DE MACEIÓ.**

**RESUMO**

As UTI's tem sido definidas como um serviço de saúde para indivíduos em situações graves, porém com potenciais condições de recuperação os quais seriam beneficiados por uma observação clínica mais detalhada e por um tratamento invasivo.O Objetivo deste estudo foi identificar que tipo de paciente é submetido a ventilação mecânica invasiva,verificar quais as patologias mais freqüentes que levam o paciente a fazer uso da mesma, bem como registrar as diferenças existentes nos hospitais particulares, no que tange ao perfil dos pacientes ventilados mecanicamente.

**PALAVRAS CHAVES**: Perfil Epidemiológico, UTI, Ventilação Mecânica Invasiva, Insuficiência Respiratória.