REVIEW ARTICLE

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PREVENTION MEASURES FOR PNEUMONIA ASSOCIATED WITH MECHANICAL VENTILATION: AN ANALYSIS IN THE LIGHT OF SCIENTIFIC LITERATURE

MEDIDAS DE PREVENÇÃO DA PNEUMONIA ASSOCIADA À VENTILAÇÃO MECÂNICA: UMA ANÁLISE À LUZ DA LITERATURA CIENTÍFICA

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ABSTRACT

Objective: The objective of this study was to analyze the preventive measures for Pneumonia associated with Mechanical Ventilation in Intensive Care Units. Method: This is an integrative review conducted in January 2021. The search for the articles occurred from the databases: Scientific Electronic Library Online (SciELO); Latin American and Caribbean Literature on Health Sciences (LILACS) and Nursing Database (BDENF). Original research articles were included, available in full, in Portuguese, English and Spanish, with publication in the last 03 years. Studies that did not portray the reality of adult ICU or did not answer the guiding question were excluded. At the end, 11 articles were selected. Results and Discussion: Regarding the aforementioned VAP prevention measures: decubitus elevated from 30th to 45th was present in all studies analyzed (100%). Oral hygiene with Chlorhexidine 0.12% (90.9%) and Cuff pressure between 20 and 30 mm H20 (81.8%) were other measures that stood out. Conclusion: It is noticed that the measures to prevent VAP are well disseminated and have a consensus in the scientific field, the challenge, however, is in monitoring the adherence of professionals to this set of actions, which directly reverberates in the rates of infection and safety of the patient.

Keywords: Hospital Infection; Pneumonia Associated with Mechanical Ventilation; Intensive Care Units.

RESUMO

Objetivo: O objetivo deste estudo foi analisar as medidas de prevenção de Pneumonia associada à Ventilação Mecânica em Unidades de Terapia Intensiva. Método: Trata-se de uma revisão integrativa realizada em janeiro de 2021. A busca dos artigos ocorreu a partir das bases de dados: Scientific Electronic Library Online (SciELO); Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS) e Base de Dados em Enfermagem (BDENF). Foram incluídos artigos de pesquisa original, disponíveis na íntegra, em idioma português, inglês e espanhol, com publicação nos últimos 03 anos. Foram excluídos estudos que não retratavam a realidade de UTI adulto ou não respondessem à questão norteadora. Ao final, 11 artigos foram selecionados. Resultados e Discussão :Em relação às medidas de prevenção de PAV citadas: decúbito elevado em 30º a 45º esteve presente em todos os estudos analisados (100%). Higiene oral com Clorexidina 0,12 % (90,9%) e Pressão do cuff entre 20 e 30 mm H20 (81,8%) foram outras medidas que se destacaram. Conclusão: Percebe-se que as medidas de prevenção da PAV são bem disseminadas e apresentam um consenso no âmbito científico, o desafio, porém está no acompanhamento da adesão dos profissionais a esse conjunto de ações, o que reverbera diretamente nas taxas de infecção e segurança do paciente.

Palavras-chave: Infecção Hospitalar; Pneumonia Associada à Ventilação Mecânica; Unidades de Terapia Intensiva.

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INTRODUCTION

According to the National Health Surveillance Agency (ANVISA), Hospital Infections (HI) are defined as any infectious cause contracted by the patient after admission to a hospital environment[1]. In terms of incidence, it is estimated that, for every 100 hospitalized patients, 10 will be affected by HI, causing ethical, legal and social problems, in addition to prolonging the hospitalization time and in more severe cases causing deaths[2].

Among the various problems that affect the quality of care and negatively impact patient safety, health care-related infections (IRAS) stand out. THE IRAS increase the hospitalization time, increase care costs and even morbidity and mortality[3]. These infections may manifest during hospitalization or after hospital discharge [4].

The use of increasingly improved procedures, the pathogenicity of microorganisms and the inadvertent use of antimicrobials resulting in the appearance of microbial resistance are the main responsible for the increase in IRAS indices. Among these infections, ventilator-associated pneumonia (VAP) stands out, with negative results for both patients hospitalized in the Intensive Care Unit (ICU) and for health institutions, increasing morbidity and mortality among patients[5].

VAP is the infection that occurs 48 hours after intubation and/or 72 hours after extubation, whose etiological agents were not present during the patient's admission period. It arises as an infection that affects mechanically ventilated critical patients in the ICU. Epidemiological data show that VAP has an incidence between 10 and 30% of all icu patients. In addition, it is associated with prolonged hospitalization, increased health care costs and mortality ranging from 8.1% to 31.9%, representing a therapeutic challenge[6].

These infections are considered more severe in the ICU, where patients dependent on intensive life support are treated. In this environment, the patient is more exposed to the risk of infection, given his clinical condition and the variety of invasive procedures routinely performed. In ICU, patients are 5 to 10 times more likely to get infection and this may represent about 20% of the total infections of a hospital[7].

In addition to this, the Ministry of Health (MH) implemented through Ordinance Number 2,216 of 1998, the Hospital Infection Control Commission (CCIH), which works to reduce the incidence and severity in the evolution of hospitalized patients, reduction of hospital cost through the control and prevention of IRAS[8].

The CCIH has an important role in hospital institutions in the search for prevention and control of infections, in which it develops a set of deliberate and systematic actions, with a view to the maximum reduction of the incidence and severity of

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these, being the professional nurse, the ideal professional to make up the team, with management skills, evaluation of the quality of services and care practices[9].

Given the importance and complexity of VAP, it is essential to carry out measures that have an impact on prevention, leading to a reduction in the occurrence of infection. The use of these recommendations has as relevance the variability of practices, in which their interventions are based on scientific evidence, resulting in the reduction of incidence rates, improving the care provided and, therefore, providing a better prognosis of the critically ill.

In view of the above, it is essential that prevention actions be a priority in health institutions, in order to promote safety to patients who need invasive ventilatory care during their icu stay. In addition to allowing the identification of vap prevention care, it is important to observe the perception of those involved regarding this problem and the mapping of current conditions that can be worked in educational spaces, thus contributing to the strengthening of promotion and prevention actions.

This study aims tosupport the prevention and control measures of Ventilator-associated Ventilator pneumonia performed in Intensive Care Units described in the international literature.

METHOD

This research is an integrative literature review, with a quantitative-qualitative approach, carried out in the period of January 2021. This type of study seeks to synthesize the results of internationally recognized research in the thematic area addressed. In addition, it is an important tool in health because it encourages the use of scientific evidence present with repercussions for professional practice[10].

The search of the articles to make up the review occurred through peer review, from the following databases: Scientific Electronic Library Online (SciELO); Latin American and Caribbean Literature on Health Sciences (LILACS) and Nursing Database (BDENF).

The choice of the bases mentioned was due to the wide scope of internationally known studies, in order to obtain the best and most current evidence on the subject. For the searches, the: the keywords "Pneumonia Associated with Mechanical Ventilation" and "Prevention" were used; and the descriptor via Descriptors in Health Sciences (DeCS), "Intensive Care Units". The crossing of both was performed by means of the Boleyn operator "AND".

The searches occurred in order to be more reliable and not to escape the main theme researched, which was based on the following guide question: What measures to prevent and control Ventilator Associated

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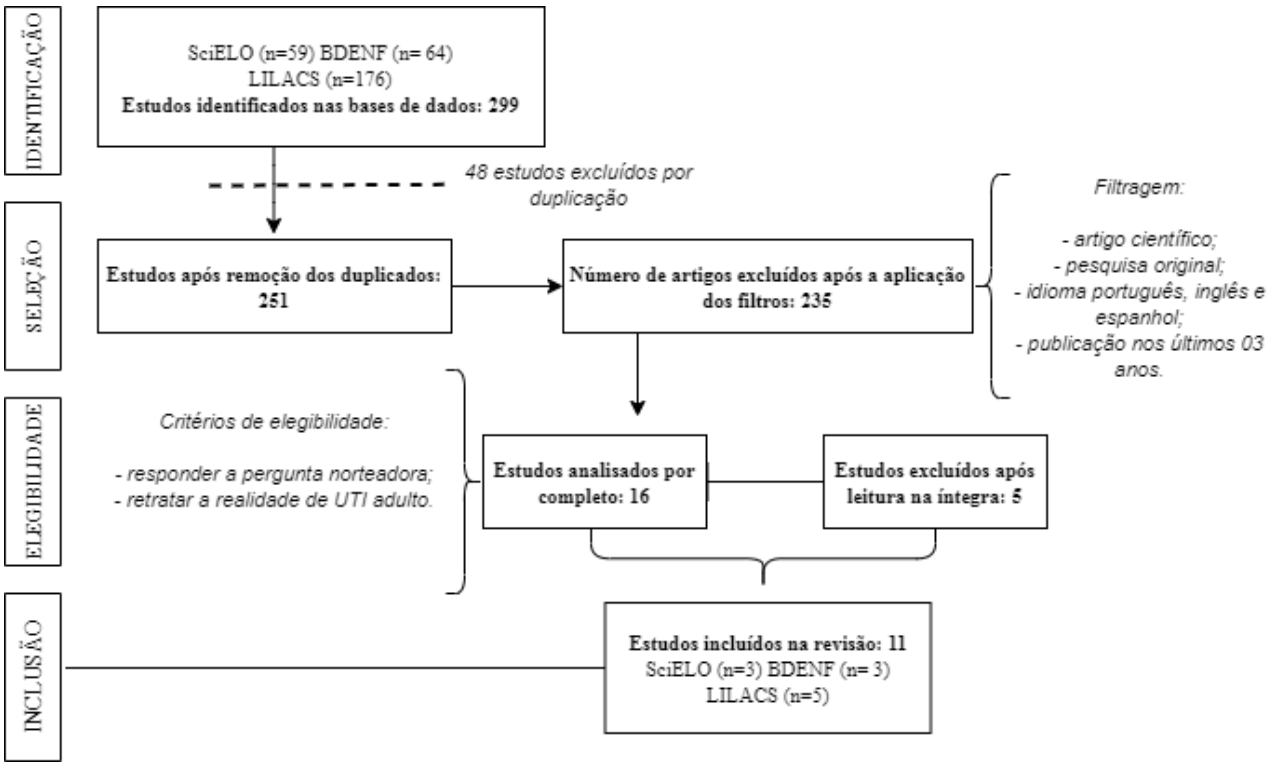
With Mechanical Ventilation are most used today in Intensive Care environments?

Inclusion criteria used filtering by scientific articles, original research, available in full, in Portuguese, English and Spanish, with publication in the last 03 years (2018-2020). We excluded those studies that did not portray the reality of Intensive Care Units with hospitalization of the adult public or that did not answer the research question regarding the prevention and control measures of VAP in these environments.

In the intersection "Ventilator-Associated Pneumonia" and "Intensive Care Units" performed without filters, the following results were found: 34 studies in SciELO, 29 in BDENF and 101 in LILACS, totaling 164 results. After applying the filters, 130 studies were excluded from the sample, as well as 29 were duplicated among the 3 databases. For complete analysis, 5 articles remained, of these 1, the study theme was not adapted after reading the title and abstract, thus leaving 4 studies to make up the sample.

In relation to "Prevention" and "Ventilator-associated pneumonia", 135 results were found, 25 in SciELO, 35 in BDENF and 75 in LILACS. After filtering, 105 studies were excluded and 19 were duplicated in the searches. For the complete analysis of the remaining 11 articles, 2 studies were excluded because they were review articles and not original studies, as well as 1 article did not portray the ICU environment and 1 article contained the context of pediatric ICU and not adults. Thus, 7 studies were chosen to make up the sample. At the end, with the union of the results of the two crosses, 11 articles were selected to make up the review. Figure 01 presents according to the PRISMA methodology the articles that comprised the integrative review.

Figure 1. Prism of searches Scielo, LILACS and BDENF. Sobral, Ceará, Brazil, 2021.



Source: Own elaboration.

RESULTS AND DISCUSSION

From the selected studies, their analysis was performed from Ursi's instrument[11] adapted by the authors according to the following table 1. The following parameters were used: title, author/year, language, study objective, area of publication, type of study and prevention and control measures of VAP cited in the studies.

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Table one. Instrument for analysis of studies. Sobral, Ceará, Brazil, 2021.

No.	title	Author/ Year	language	Goal	Publishing Area	Type of Study	Measures to Prevent and Control of VAP
I.	Good practices in the prevention of ventilator-associated pneumonia	Alecrim et al., 2019	Portuguese	Evaluate the support of health professionals to a set of good practices for the prevention of Ventilator-Associated Pneumonia Mechanics, compliance index to individual measures and association of clinical characteristics of patients and adhering to the set of good practices with pneumonia.	nursing	Prospective cohort study	- Daily evaluation of sedation and reduction whenever possible; - Change of circuit every 7 days; - Maintenance of the pressure of the cuff between 20 and 30mm H2O; - High decubitus (30º to 45º); - Oral hygiene with Chlorhexidine solution 0.12% (3 times a day).
Ii.	Adhering to the ventilator-associated pneumonia prevention bundle.	Barros, 2019	Portuguese	Assess the compliance and compliance of practices that are part of a pneumonia prevention bundle Associated with Mechanical Ventilation in an Adult Intensive	nursing	Descriptive study with prospective approach	- Positioning of the headboard between 30 and 45º; - Cuff pressure between 20-30 cm H2O; - Oral hygiene with

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				Care Unit.			chlorhexidine 0.12%; - Respiratory and motor physiotherapy; - Care with the aspiration of secretions; - Discontinuation of sedative infusion.
Iii.	Education to prevent Ventilator associated pneumonia in Intensive Care Unit.	White et al., 2020	Portuguese	To evaluate the nursing support to the prevention bundle for Ventilator-Associated Pneumonia and the incidence rate before and after Continuing Education.	nursing	Almost experimental, retrospective study.	- Position of the mechanical ventilator filter above the insertion of the endotracheal tube or tracheostomy, absent from dirt; - Headof the upper bed between 30° and 45°; - Oral hygiene with chlorhexidine 0.12% and toothbrushing; - Pressure of the bucket, between 20 and 30 mmHg.
Iv.	The impact of interprofessional learning on ventilatory-associated pneumonia: implementation of bundles in an intensive care unit	Coelho et al., 2019	Portuguese	Verify the impact of bundles and interprofessional learning in the prevention of pneumonia associated with mechanical ventilation in an intensive care unit.	nursing	Almost experimental study.	- Hand hygiene; - Elevation of the bed to 30-45°; - Daily interruptions of sedation; - Daily spontaneous

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							breathing tests; - Prophylaxis of thromboembolism; - Oral hygiene with chlorhexidine gluconate; - Drainage of subglotic secretion; - Constant monitoring of cuff pressure; - Permanent Education.
V.	Pneumonia associated with invasive mechanical ventilation: nursing care	Cross, cruz, cruz. Martins, 2019	Portuguese	Identify nursing procedures in patients undergoing invasive mechanical ventilation and the development of pneumonia in an intensive care unit.	nursing	Longitudinal and descriptive study	- Bundles; - Elevation of the head of the bed; - Hand hygiene; - Aspiration of secretions; - Oral hygiene; - Maintenance of ventilatory circuits; - Cuff pressure assessment.
Saw.	Ventilator -Associated Pneumonia: perception	Dutra et al., 2019	English	To apprehend the perception of nursing professionals about patient safety under mechanical ventilation with a view to	nursing	Qualitative, descriptive and exploratory study	- Hand hygiene; - Maintenance of high decubitus between 30 and

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	of the nursing staff			preventing VAP.			45°; - Daily adequacy of the level of sedation and spontaneous breathing test; - Subglottic aspiration; - Oral hygiene with antiseptics; - Care with the fan circuit, inlers and nebulizers; - Cuff pressure monitoring.
Vii.	Good practices for preventing ventilator-associated pneumonia in the emergency department	Fleet et al., 2019	English	To evaluate the conformity of the set of good practices for the prevention of ventilator-associated pneumonia in the emergency department of a university hospital.	nursing	Cross-sectional, analytical and quantitative study.	- Elevation of the headboard from 30º to 45º; - Daily interruption of sedation; - Prophylaxis of peptic ulcer and deep vein thrombosis (DVT); - Oral hygiene with chlorhexidine; - Aspiration of subglottic secretion; - Measurement of cuff pressure.
Viii.	Multiprofessional care related to the prevention of	Liz et al., 2020	Portuguese	To know the perception of the multidisciplinary team about the care related to prevention	nursing	Descriptive, qualitative study.	- Oral Hygiene;

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	ventilator-associated pneumonia			measures to pneumonia associated with mechanical ventilation.			- Change of decubitus; - Close performance of CCIH; - Airway assessment; - Permanent Education.
Ix.	Ventilator-Associated Pneumonia: the Knowledge of Health Professionals Towards Prevention and Educational Measures	Melo et al., 2019	English	To evaluate the knowledge of health professionals about the prevention of Ventilator-Associated Pneumonia in critically ill patients admitted to intensive care units and to promote continuing education for ICU professionals on VAP prevention.	nursing	Cross-sectional, quantitative-qualitative study.	- Hand hygiene; - Elevation of the headboard; - Cuff pressure; - Respiratory physiotherapy; - Oral hygiene; - Removal of sedation; - Permanent Education.
X.	Adhering to preventive measures versus incidence of ventilator-associated pneumonia	Silva Lourençone et al., 2019	Portuguese	To evaluate the rate of follow-up of preventive actions of the nursing team for VAP, after the restructuring and application of the prevention protocol and verify the incidence density rates of patients with VAP.	nursing	Observational, longitudinal study.	- Bundle; - Oral hygiene with chlorhexidine 0.12% twice daily, at 8am and 8pm; - Headboard raised at 30 to 45°; - Pressure of the bucket evaluated twice a day, at the same time of oral hygiene; - Position of the fan circuit filter positioned above its

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							insertion of the tube and without the presence of dirt.
xi.	Adhering to the protocol of pneumonia associated with mechanical ventilation	Zigart et al., 2019	English	To know the nursing team's support for the protocol of pneumonia associated with mechanical ventilation in intensive care units.	nursing	Quantitative, descriptive, observational, cross-sectional study.	- Keep the decubitus elevated between 30 and 45º; - Heat and Moisture Exchangers (HME) filter; - Care with the suction, inhalation and nebulization system.

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Of the 11 articles analyzed, 2 of these (18.2%) 2020 and 9 are from 2019 (81.8%). No studies of the year 2018 were evidenced after the searches performed.

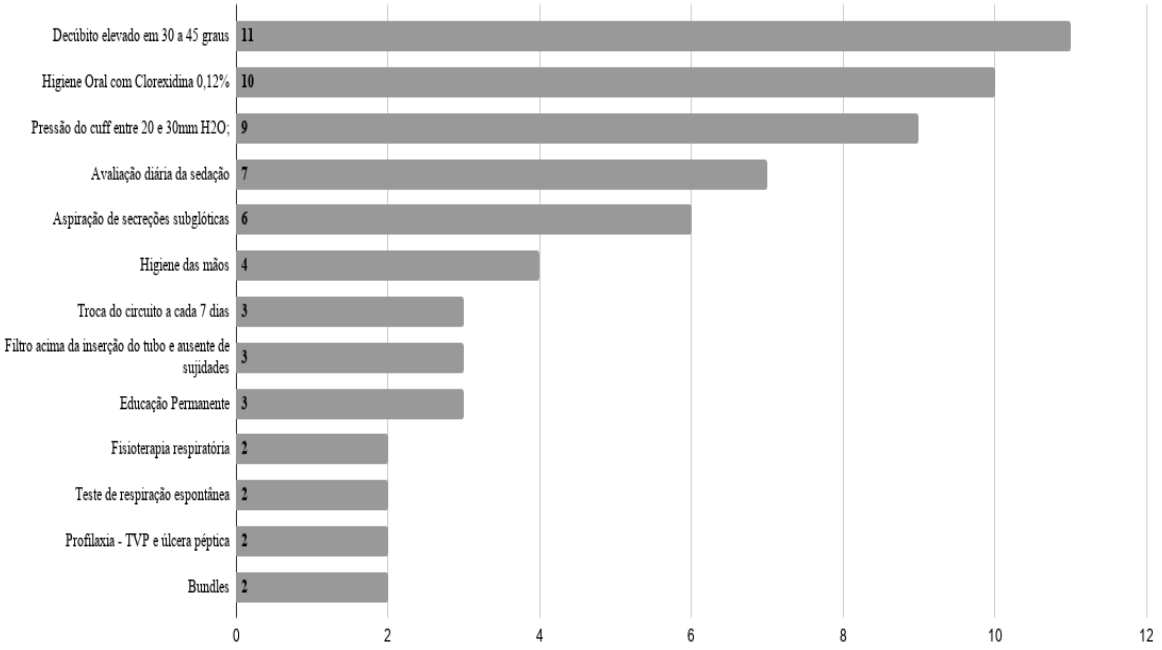
Regarding the languages of the studies analyzed, 63.6% of these (n=7) were available in Portuguese in the original version, and 36.4% (n=4) in English. No Spanish language studies were found, although some were available in the language in translated versions.

About the publishing area, 100% of the articles were nursing. Although the search occurred in a database focused on this public, BDENF, the same trend of publication in the area in the other databases is perceived, thus confirming what the article [12] brings about the importance of nursing in the management and coordination of VAP prevention measures in a multiprofessional logic based on scientific evidence.

Of the study types present in the sample, 72.7% (n=8) fit as descriptive/cross-sectional. Almost experimental studies (18.2%) appeared twice and one of the articles analyzed was a cohort study (9.1%).

Figure 2 below shows the graph of the incidence of VAP prevention measures that were most repeated among the studies analyzed.

Figure 2. Incidence of vap prevention measures. Sobral, Ceará, Brazil, 2021



Source: Own elaboration

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Regarding the incidence of the MEASURES of VAP prevention cited in the articles of the review, High Decubitus in 30 to 45 degrees was the one that was most repeated among the articles, being present in all studies analyzed (100%). Oral hygiene with Chlorhexidine 0.12% in 10 of the 11 articles (90.9%) and Cuff pressure between 20 and 30 mm H20 in 9 of 11 articles (81.8%) were other measures that stood out among those recommended for the prevention of this type of infection.

For the discussion of the studies, the thematic analysis of the studies was performed and, along with the current available scientific literature, it was discussed about the scientific evidence on prevention and control measures of VAP.

Good practices for the prevention of Ventilator-Associated Pneumonia in Intensive Care: what is more current?

Prolonged use of mechanical ventilation predisposes patients to develop adverse events such as sepsis, acute respiratory distress syndrome (ARDS), pulmonary embolism, barotrauma, pulmonary edema and the main one, Ventilator-Associated Pneumonia[3].

The autors[13] classify the risk factors for the development of VAP as modifiable and non-modifiable: the latter are related to the patient's age and health conditions. The first include: prolonged time of mechanical ventilation, subsequent endotracheal intubation, nasogastric probing, immobilization, bench blood pressure, use of antimicrobial agents, use of antacid drugs, sedation, inadequate hand hygiene by professionals and poor asepsis care during intubation, airway aspiration and respirator handling.

It is precisely these modifiable factors that the application of a package of measures can significantly reduce VAP rates, especially in intensive care sectors by preventing this type of infection. The set of these actions can be more simplified and succinct, in the format commonly called bundles, in order to facilitate the understanding and adhering of professionals to these procedures. The monitoring of these indicators of support is indispensable for the control of the rates of density and incidence of VAP[14].

However, the bundles, in isolation, do not ensure a reduction in VAP rates, and therefore educational actions of training and training of the team should be implemented, as well as offering feedback on the monitoring of the rates of vaP and incidence in order to reflect critically of the team in relation to their daily practices[7].

In this process, nursing assumes a central role, as a profession that acts directly

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in the care of critically ill patients, besides being the nursing team responsible for most of the actions proposed as preventive to the development of VAP[15]. Therefore, corroborating what the authors[6,16] bring in Articles III and VIII, it is indispensable the involvement of nurses, as leader of this team, in the formative processes in relation to the prevention of AIS, in addition to direct contact with the head of the hospital's CCIH in the adoption of these measures.

To quantify the importance of the bundle strategy and the monitoring of the rates of access to the check-list, of the 11 articles selected from this review, the word "bundle" is present in the objectives of these[16-18], and in 4 other articles, the objectives seek to evaluate the support of professionalsto the set of good practices of prevention of VAP[19-22]. Thus, there was a percentage of 63.6% of studies in the sample that basically deal with bundle summing up as a preventive measure of VAP.

The article number I[19], for example, when evaluating the participation of health professionals to good practices of PREVENTION of VAP, showed that the item with the highest support was the daily evaluation of sedation (91%), followed by the change of the circuit every 7 days (82.6%). On the other hand, the item with the lowest support was the maintenance of cuff pressure between 20 and 30 cm H20 (23.9%).

Preventive measures are related to the decrease in infection rates, reaching an incidence density reduction from 8.6 VAP per 1000 days of ventilation to 2.0 VAP per 1000 days of ventilation. In addition, they can reduce icu stay days from 36 to 27 days of stay[6].

The authors [19] evaluated, among other risk factors for VAP, the level of sedation depth according to the RASS scale[23] in an international multicenter study, showed that the proportion of patients with deep sedation decreased from 55.2% to 44% after implementation of a sedation protocol and nurse-managed analgesia.

Another intervention indicated in the package of measures for the prevention of VAP in adult patients concerns oral hygiene with chlorhexidine 0.12%[14] found in their studies that although oral hygiene is characterized as an indispensable care in patients under mechanical ventilation, the results obtained demonstrated a low compliance to this measure (48.8%), which was attributed to the lack of knowledge of professionals, inadequate technical training and lack of daily follow-up of the adectation.

The authors[24] evaluated the support to the complete set of VAP prevention and identified compliance of 94%, reflecting the

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reduction of the incidence density of VAP from 18.5% to 9%, reduction of mortality from 38% to 30%, length of stay in the ICU of 2 days and hospital costs from US$ 2000 to US$ 3000 per case of VAP.

The same authors stated that this result was only possible, thanks to permanent education and periodic training, through a strictly managed protocol, in addition to the observational method, considered the most accurate for monitoring the support[24].

In view of the above, it is relevant that VAP prevention actions be promoted in health institutions to ensure patient safety. The participation of the multidisciplinary team is also significant, through the adoption of standardized preventive measures, team training, continuing education in the care process, in order to avoid failures in this process and thereby reduce mortality rates[25].

According[17], in his article, evaluated in the same way the compliance and compliance of practices that are part of a vap prevention bundle. The practices selected for this were: 1 - positioning of the headboard between 30 and 45º; 2 - cuff pressure between 20-30 cm H2O; 3 - oral hygiene with chlorhexidine 0.12%; 4 - respiratory and motor physiotherapy; 5 - care with the aspiration of secretions; 6 - interruption of sedative infusion.

The frequency of bundle access by the professionals had significance for 3 of the 6 items proposed, namely: headboard position between 30 and 45º, care with secretion aspiration and respiratory and motor physiotherapy. The overall participation rate was 77.4%[17].

Since the creation of the first bundle, other mechanical ventilation bundles are being proposed with suggestions for different prevention measures to implement. However, it is important to point out that the Institute for Healthcare Improvement (IHI) proposes that very extensive bundles should not be drawn up, due to the greater difficulty in administering and applying them both to the target audience and to professionals[26].

The authors[16] evaluated the nursing's support to the bundle before and after permanent education on the subject. The preventive measures performed by the nursing department were: position of the mechanical ventilator filter above the insertion of the endotracheal tube or tracheostomy, absent from dirt; head of the upper bed between 30º and 45º; oral hygiene with chlorhexidine 0.12% and toothbrushing of teeth recorded in medical records at 8 and 20 hours; and pressure between 20 and 30 mmHg. The overall support of the nursing team was 92.7%, with a significant increase in the number of permanent education.

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The authors [18], in article number IV, evaluated the impact of bundles and interprofessional learning, through 3 research stages: pre-intervention, which consisted of direct observation and interview; intervention, in which the training was performed through clinical simulations; and post-intervention, in which the impact of the strategies implemented by direct observation was evaluated.

The authors of article IV used a strategy similar to the study[24] for the monitoring of preventive actions. In addition, after the intervention, they obtained increased cuff endotracqueal pressure (8.10%), daily sedation interruption (16.67%), and subglottic aspiration (18.75%).

The authors[7], in article V, identified nursing procedures in patients submitted to invasive mechanical ventilation based on standards published in 2015 by the General Health Directorate of Portugal. The nursing care that was identified and observed were: elevation of the head of the bed, hand hygiene, aspiration of secretions, oral hygiene, maintenance of ventilatory circuits. Being the verification of cuff pressure and aspiration of secretions the procedures that registered less support among professionals.

Based on the perception of nursing professionals about patient safety under mechanical ventilation with a view to the prevention of VAP[28], Article VI[28], showed among the interviewees who recommended to intervene in modifiable risk factors for the prevention of VAP by adopting measures similar to those brought by study[13] as: hand hygiene; elevated decubitus between 30 and 45°; daily adequacy of sedation and spontaneous breathing test; subglottic aspiration; oral hygiene with antiseptics; judicious use of neuromuscular blockers; care with the ventilator circuit; inalators and nebulizers; care to avoid unscheduled extubation and reintubation; cuff pressure monitoring; preferential use of orotracheal intubation; and maintenance of enteral probing in the gastric or pyloric position.

The study [20] evaluated the compliance of five preventive measures of VAP: elevation of the headboard from 30º to 45º, daily interruption of sedation, prophylaxis of peptic ulcer, prophylaxis of Deep Vein Thrombosis (DVT) and oral hygiene with chlorhexidine. Of these, the most frequently performed measure was prophylaxis of peptic ulcer (compliance greater than 80%), and those performed less frequently were headboard elevation and oral hygiene (compliance below 50%).

The study[6] highlights in its article, number VIII of this review, that the strategy of rounds, multiprofessional visit to bedside, was described by the multidisciplinary team

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as a positive exchange of knowledge, being a moment of discussion and proposition together of care alternatives, in addition to the application and verification of established protocols.

The articles[21,22,29], bring important contributions regarding evidence related to the prevention of VAP. The study[29], for example, when evaluating the knowledge of professionals about this theme, it evidenced weaknesses of the participants in relation to hand hygiene and biosafety. To this end, they recommend strategies for better access to practice, strengthening the concepts of periodicity, necessary moments and the technique itself.

In the meantime, ANVISA strongly recommends the use of liquid soap with antiseptics such as chlorhexidine in places with the presence of multidrug-resistant bacteria, such as ICUs, with the objective of reducing cross-transmission[30]. In other areas of health services, the use of alcoholic preparation for the hands continues to be stimulated.

The study[21] bring considerations regarding the performance of oral hygiene related to the decrease in the incidence of VAP, more precisely on tooth brushing, which, despite decreasing the time of mechanical ventilation, can lead to the displacement of the biofilm formed in the oral region to the lower airways.

Moreover, in relation to cuff pressure, the same authors[21] consider the values between 18 and 22 mmHg or 25 to 30 cm of H20 as more adequate, in order to avoid compromising tracheal microcirculation due to excessive pressure and the passage of subglottic secretion at insufficient pressure. On the other hand, ANVISA recommends a pressure between 20 and 23 mmHg, considering values above these, as potential risks to injuries by ischemia and trachea stenosis[30].

The study [22] also includes the indication of the use of heat and moisture exchanger filter (HME), and indications and care with the aspiration, inhalation and nebulization system as interventions that cause a significant impact on the prevention of VAP.

CONCLUSION

It is perceived that the prevention and control measures of VAP are well disseminated and present a consensus in the scientific sphere based on the national and international guidelines defined. Most of the studies analyzed included the set of measures already widely disseminated and practiced by most hospitals, especially those with ICU sectors.

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The challenge lies in monitoring the professionals' adhering to this set of actions, which is sometimes neglected by the large number of care demands, reverberating directly in infection rates and consequently in patient safety and the quality of care offered. In addition, areas that act directly in the care of patients on mechanical ventilation, such as Physiotherapy and Medicine, for example, still publish studies on the subject in a timid way, leaving it up to nursing to have most of the evidence found.

Thus, it is suggested that further studies be conducted from an interprofessional perspective and that interventions and instruments for analyzing the adhering to VAP prevention measures be disseminated and widely discussed and replicated.

The study is considered a limiting point to the study the absence of publications from other professional categories besides nursing, as well as the incipient literature on the subject in 2020, noddedly affected by the context of pandemic faced by all, but which a priori should bring important repercussions and innovations regarding patient care in ventilatory support.

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