THE EFFECTIVENESS OF ORAL HYGIENE BY USING A ANTISEPTIC ORAL HYGIENE ON THE PREVENTION OF VENTILATOR ASSOCIATED PNEUMONIA (VAP) IN PATIENTS INSTALLED MECHANICAL VENTILATOR: A LITERATURE REVIEW

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ABSTRACT
Introduction: VAP is life-threatening complications for each patient treated in the ICU, especially those using tracheal tube and/or ventilator. The purpose of this literature review is to determine the effect of VAP Bundle (oral hygiene) in the prevention of VAP in patients with mechanical ventilation. **Method:** The search strategy in English and Indonesian studies relevant to the topic predetermined, performed by accessing the database, ProQuest Research Library and Google scholar with the keywords of VAP Bundle, Oral Hygiene, accured Ventilator Pneumonia. **Result:** After a simple analysis of the titles and abstracts of only five articles that fit inclusion criteria. VAP Bundle Care particular oral hygiene continue improving through the latest facts regarding appropriate interventions in preventing VAP. Various nursing interventions can be done in particular to prevent the occurrence of VAP, and based on an article that explored that with antiseptic oral hygiene is the most effective intervention for the prevention of VAP. **Discussion:** This research is expected to increase awareness of nurses as care providers in preventing the occurrence of VAP in patients on mechanical ventilation.

Key words: Ventilator Acquired Pneumonia (VAP), VAP bundle, oral hygiene, patient on mechanical ventilation

INTRODUCTION

One of infectious disease that occurs as a complication of installation of tracheal and/or ventilator on hospitals admission is pneumonia or called with Hospital Acquired Pneumonia (HAP). HAP is happened in the intensive care unit primarily associated with the installation of ventilator known as ventilator-associated pneumonia (VAP). VAP is life-threatening complications for each patient treated in the ICU, especially those using tracheal tube and/or ventilator. VAP is responsible for 90% of the incidence of infection in hospitals and occur within 48-72 hours after intubation and therefore contributes on the increased use of the ventilator and length of hospitalization (O'Keefe-McCarthy, et al, .2008). VAP affects the continuity of patient care in the ICU. The onset of complications, morbidity and mortality rates are higher, as well as an increase in the cost of care, especially in critically ill patients who mounted ventilator (Muscedere et al, 2008; Vincent, et al., 2010). In critically ill patients, generally VAP is caused by microorganisms from the nasal aspiration, oropharyngeal or gastric invade the lower respiratory tract, facilitated by a decrease in the immune system (Torres et al, 1992 in Keeley, 2007). VAP can occur in patients with poor oral health and oral care less (Grap & Munro, 1997). Some things are also a risk factor for the incidence of VAP is the resting position early and severity of disease (Tolentino-Delos Reyes, et al, 2007).

In the United States, VAP is the second leading cause of HAI and 25 % of the incidence of infection in the ICU (Sedwick , et al. , 2012), while in Europe VAP is the most common nosocomial infection second to urinary tract infection (Koeman & Joore, 2006). In Indonesia there are no exact data on the incidence of VAP (Widyaningsih, & Buntaran, 2012). However refer on the data from abroad this condition should come into attention of all parties including the nurse. Many things can be done to prevent the occurrence of VAP, like a lot of research has also been conducted, one of the

results of research is the VAP Bundle, a nurse should know the intervention that has been set on the VAP Bundle to prevent VAP .

Based on CPIS (2012), the component Bundle VAP are: Elevate head 45° when possible, if not, consider to maintain the position of the head of more than 30°, Evaluation daily on the readiness of extubation , use of endotracheal tube with drainage secretion subglottic, Oral care and decontamination with chlorhexidine , a safe enteral nutrition early in 24-48 hours after ICU admission. One Bundle development of VAP is oral hygiene measures are effective in patients using mechanical ventilator, a cost efficient manner to reduce morbidity and mortality in patients with VAP. This literature review was aimed to understand the evidence based and literature review on the effect of VAP Bundle (oral hygiene) on the prevention of VAP (ventilator-associated pneumonia) in patients with mechanical ventilator.

METHOD

The literature searchs strategy on this report to be comprehensive in the medical literature and nursing, especially literature on respiratory, critical medical and critical nursing. Conducted a literature searchs to find information in accordance with the question and the purpose of writing. The data source searches are conducted through computer databases via ProQuest Research Library and Google scholar. The literature used was genuine and Dissertation research articles published between the years 2006-2012. Research article or literature in use are in Indonesian language and English.

Keywords used are VAP Bundle, Oral Hygiene, Ventilator Acquired Pneumonia. ProQuest search results on 25 journals, while Google scholar 20 journals. The number of journal on the search for the topic of oral hygiene for prevention of VAP has been done. Based on previous researches, a wide range of materials for oral hygiene recommendations. Full text articles and abstracts are reviewed, to choose studies that fit the criteria of researchers. Inclusion criteria for this study were: journal that study on the effect of oral hygiene in the prevention of VAP in patients on mechanical ventilation, the design of the research is a Quasi-Experimental. Simple analysis carried out on the title and abstracts of five articles that fit inclusion criteria. The method used in all the articles of this journal is quantitative method with a quasi-experimental design (quasy-experiment) which this draft seeks to reveal causal relationships by engaging with the control group and the experimental group in addition to the method appropriate to answer the research objectives. Articles will be reviewed as further samples are presented in Table 1.

RESULT

There are 5 research articles reviewed all using quantitative designs with Quasi-Experimental methods which study on oral hygiene as one Bundle VAP applications on patients using mechanical ventilation in the ICU. The results are recorded based on the data obtained by using statistical tests. Assessment indicators used CPIS scores. Diagnostic Criteria for VAP by CPIS (2012) are as follows: Radiographic abnormalitas, opacs their views on chest radiographs new or progressive and persistent, compatible with pneumonia, such as: infiltrate, consolidation or cavitation, WBC ≥ 12,000 or <4000, Body temperature> 38° C with no other cause, and at least 2 of the following signs secretion tracheal: onset purulent new, or change the characteristics, or increasing amount of secretion, increased need for orosuction, respiratory krakles on inspiration or wheezing bronchial auscultation,and worsening gas exchange (eg, desaturation O2, PaO 2 / FiO 2 <240, an increased need for oxygenation or ventilation)

VAP Bundle is designed for a multidisciplinary professionals care team and provides ways of preventing the occurrence of VAP. Our review showed that VAP Bundle has goals and objectives that can show how interventions for the prevention of VAP. The indicators use to assess the presence of VAP is CPIS scores. In these articles we reviewed, there are other indicators that are used to determine an incidence of VAP.

1. Dissertation Alice Peggy Mulligan McCartt (2010) in his study to assess the presence of VAP by inspecting oral cavity acidity (pH), oral cavity bacteria culture results and using CPIS scores.

   Research results: mouth pH in all three groups there was no significant difference, the culture of the oral cavity was statistically significantly reduced in all three groups. The use of a 0.12% chlorhexidine spray and fabrics standard no significant difference

between the 2 groups (group 1 and group 3), while the use of a 0.12% chlorhexidine and toothbrush in group 2 showed significant results in the first 72 hours. So the conclusion of this article that a 0.12% chlorhexidine and toothbrushes are more effective in the prevention of VAP. Based on the results of this research can be applied in order clinic.

2. Berry, AM (2013), in his research, to determine the presence of dental plaque microbiological samples were taken with swabs on the surface of the teeth above and below as well as on the patient's gum. This was done on day 1 and day 4 since the study began. Semi-Quantitative Analysis grouped positive if the colonization of the mouth as> 10 ^ 5 cfu / ml. While to determine the incidence of VAP by thorax images every day in accordance with the protocol in patients with mechanical ventilation., Otherwise occur VAP if the results radiologinya (X-Ray No infiltrate accompanied by two of the signs such as: (a) Temperature> 38.5 ◦ and temperature <35.0 ◦c, (b) white blood cells> 11,000 / mm³ or <4000 / mm³, (c) there is a change of the characteristics of a secret becomes muco-purulent or purulent, (d) an increase in the need for oxygen fraction or the use of PEEP over 20%. in this study vaguer instrument used. Here mentioned no significant difference between groups in the intervention Listerine® or sodium bicarbonate and the control group. among these three groups was no more effective, but in this study it is strongly recommended for the use of sodium bicarbonate, because the result is the closest kind. the results of this study can be applied in order lacking clinic sodium bicarbonate considering the price is quite expensive.
3. Yusnita Deborah, et al (2012) observed Each group by taking secretions from the trachea before and after treatment, for later examination count the number and type of bacteria.

   Their findings indicate that the use of closed suction system in patients with mechanical ventilation reduce the amount of bacteria significantly post-intervention, so with an open suction system. Closed suction system does better in reducing the number of bacteria in this study. Although VAP marked presence of bacteria in secret, but this research has not been able to demonstrate the occurrence of VAP certainty because there is no definite sign, so less can be applied in order clinic.
4. Yanti, Erwin (2010) observed using the observation sheet VAP characteristics with clinical data that fever> 380C (> 100.40 F) are not caused by other disorders, increasing the number of leukocytes above the upper limit of normal value (value leukocytes> 10,000/ mL) and the presence of purulent sputum.

   The findings were no significant differences result indicator value oral hygiene among the clients who make use of chlorhexidine without using chlorhexidine in prevention of VAP, so that the use of chlorhexidine as an oral hygiene may be more effective than without using chlorhexidine. In this study yet using gold standard VAP determination according to the CDC.
5. H. Mori, H. Hirasawa, S. Oda H. Shiga, et al (2006). In this study, the incidence of VAP rated based on time, duration of ventilator use, length of ICU and cause bacteria to keep doing interventions for the prevention of VAP as 30-45 ◦ sleeping positions, the use of subglottic suctioning, the use of close suction and delivery of H2 blockers.

   The findings in this study is the incidence of VAP in oral care group were significantly lower than the group that did not receive oral care. In the conclusion, oral care can decrease the incidence of VAP in patients in the ICU. This study did not mention the type of materials used so that oral care can not be applied in order clinic.5th article of this study conducted in Indonesia, Northeast Florida, Japan, with a population total of 2315 participants. Some of the shortcomings that have been reviewed in the article is on research Yusnita Deborah, here simply do not vote until the number of bacteria VAP, although one sign of VAP bacteria by the secret examination. Similarly, in research daughter Jackie (2010) to determine the existence of a VAP researchers did not use a standard instrument, just judging from the culture and the patient's clinical signs early and therefore can be said to be less valid results. Results would be valid if it is done according to the standard measurement CPIs as envisaged by the CDC.In research H. Mori et all, here did not mention the type of material used oral care, so it is not known

whether research using only plain water. From the 5th of this article, the research of Alice Peggy Mulligan McCartt (2010) in accordance with the standards and can be applied in order clinic

DISCUSSION

Implications for Nursing Practice

The research reviewed in this article shows that the application of VAP Bundle particularly oral hygiene is very effective for preventing the occurrence of VAP. Oral hygiene is done there are a variety of ways, some use antiseptic, or just ordinary liquids. It can be done with suction or toothbrush. Results of the study were obtained from the 5th article studied that oral hygiene is very influential in the prevention of VAP. The use of antiseptic provide more effective results than without antiseptic.

In the VAP Bundle is designed to be used by a multidisciplinary team of professionals and all client care on a ventilator. VAP Bundle has been widely applied in the ICU, but note that this article is based on oral hygiene with antiseptic really play a role in the prevention of VAP. It can be used as input for ICU nurses, especially nurses for nurses is one of the medical team involved in the provision of nursing care in patients with ventilator. So the results of this study can be applied in hospitals, especially care at the ICU in patients using mechanical ventilation.

CONCLUSION

VAP Bundle oral hygiene care in particular continue to experience improvement through the latest facts regarding appropriate interventions in preventing VAP. Various nursing interventions can be done in particular to prevent the occurrence of VAP, and based on an article that explored that with antiseptic oral hygiene is the most effective intervention for the prevention of VAP.

There are some suggestion include:

1. The nurse's role is indispensable in the oral hygiene to help prevent VAP
2. Keep dillakukan research with a similar theme with different materials used for oral hygiene.
3. Need to do research on all VAP Bundle so it can be a major factor for the prevention of VAP
4. Need for teamwork in the prevention of VAP.

REFERENCES

American Thoracic Societ (2005). *Infectious Diseases Society of America: Guidelines for the management of adults with hospital-acquired,ventilator-associated, and healthcare-associated pneumonia*. Am J Respir Crit Care Med 2005, 171:388-416.

Berry, AM *A Comparison of Listerin and Sodium Bicarbonate Oral Cleansing Solutions on Dental Plaque Colonisation and Incidence of Ventilator Associated Pneumonia in Mechanically Ventilated Patients*, Intensive & Critical Care Nursing 2013 275-81. Accessed on Desember 10, 2015

H. Mori, et all (2006),*Oral Care Reduces Incidence of Ventilator-Associated Pneumonia in ICU Populations* www.Proquest.com. Accessed on Desember 5, 2015

Putri Yanti dkk (2010) *Efektifitas Oral Hygiene dengan Suction Menggunakan Larutan Chlorhexidine 0,2% terhadap Pencegahan Ventilator Associated Pneumonia (VAP) pada Pasien yang Terpasang Ventilator Mekanik,* www.Google Book Accessed on Desember 5, 2015

O'keefe-Mc Carthy, et al.(2008), Ventilator-Associated Pneumonia Bundle Strategies: on Evidence based Practice, www. Google.com. Worldviews on Evidence-Based Nursing 2008, 5(4):193-204. Sigma Theta Thau International

Peggy Alice Mulligan McCartt (2010), *Effect Of Chlorhexidine Oral Spray Versus Mechanical Toothbrushing and Chlorhexindine Rinse in Decreasing ventilator Associated Pneumonia in Critically Ill Adults*, www.Proquest.com Accessed on Desember 5, 2015

Rahmiati, Titis Kurniawan (2013) *Ventilator-Associated Pneumonia Dan Pencegahannya,* jurnal Husada Mahakam Volume III No. 6, Nopember 2013, hal. 263 – 318, www.Google Accessed on Desember 5, 2015

Safdar N, Crnich CJ, Maki DG (2005) *The pathogenesis of ventilator-associated pneumonia: its relevance to developing effective strategies for prevention*. Respir Care 2005, 50:725-739,

discussion 739-741. Accessed on Desember 5, 2015

Yusnita Debora dkk (2012) *Perbedaan Jumlah Bakteri pada Sistem Closed Suction dan Sistem Open Suction pada Penderita dengan Ventilator Mekanik* jurnal Anastesiologi Indonesia Vol IV No 2, July 2012 ISSN 2089-970X,ISSN Online: 2337-5124 www.janesti.com , accessed 0n Desember 5, 2015