



EFFECTIVENESS OF NEED BASED ORAL CARE PROTOCOL ON ORAL HEALTH STATUS, OCCURRENCE, PRESENCE AND PROGRESSION OF PNEUMONIA AMONG VENTILATED PATIENT: SYSTEMIC LITERATURE REVIEW

Nursing

Ms. Manisha Devi* Nursing Tutor, Department of Medical Surgical Nursing, M.M. College of Nursing, Maharishi Markandeshwar (Deemed to be University) Mullana, Ambala, Haryana, India
*Corresponding Author

Dr. (Mrs) Jyoti Sarin Principal cum Professor, M.M. College of Nursing, Maharishi Markandeshwar (Deemed to be University) Mullana, Ambala, Haryana, India

ABSTRACT

Introduction: Oral Care is the quality indicator of standard patient care. Despite the fact that oral care considerably reduces the number of oral bacteria and the risk of aspiration pneumonia in ventilated patients, it is imperative to reduce the frequent handling of oral mucosa of patients suffering from chronic liver diseases (CLD). **Methods:** The study design was systematic review and it includes studies from databases of PUBMED and MEDLINE. **Result:** Total 34 relevant articles were under taken. Studies included are related to incidences and diagnosis of pneumonia among Ventilated Patients, assessment of Oral Health Status and frequency of oral care, role of oral care protocol and guidelines in prevention of VAP and Oral Health in Chronic Liver disease patients. Abstracted information is related to their design, population characteristics, intervention and outcomes. **Conclusion:** The findings indicate that the Oral Care Protocol was effective in improving the Oral Health Status and reducing the occurrence and Progression of Pneumonia among ventilated patients.

KEYWORDS

Oral Health Status, Occurrence of Pneumonia, Progression of Pneumonia, Ventilated Patients, Need Based Oral Care, VAP.

Introduction

Critical care is a term used to describe the care of critically ill patients whose clinical condition is unstable or potentially unstable. Critical care units or intensive care units were designed to meet the special need of acutely ill patients and a critical care nurse is responsible for assessing the life threatening conditions and providing appropriate treatment. The patients in ICU required high quality care. Patients get admitted to the ICU for various reasons like Infections, End stage liver diseases, Septic shock and some for mechanical ventilation (Kerver et al., 2008).

Poor oral health status has been associated with a number of diseased conditions including the liver disease. Approximately 85 percent of patients with cirrhosis were found to have poor oral health, 45 percent patients had periodontitis and 15 percent had gingivitis (Panov & Krasteva, 2011). Major oral clinical manifestation observed in patient with liver diseases is xerostomia, lichen planus and bleeding disorder. Kowalczyk, et al., (2014) revealed that 74 percent of the cirrhotic patients had mucosal lesion, 62.5 percent had gingivitis and 20 percent patients presented with oral and gingival mucosa discoloration.

VAP is the most common and lethal infection in patient requiring mechanical ventilation. Ventilator-associated pneumonia is defined as pneumonia that develops while a patient is receiving mechanical ventilation, usually positive-pressure ventilation delivered via an endotracheal tube for support during acute respiratory failure (Bonten, Kollef, & Hall, 2004). It refers to the Pneumonia that occurs in patients who have been on mechanical ventilation for more than 48 hours. When Pneumonia develops in patients within 48 hours of intubation it is then known as Hospital Acquired Pneumonia (Davis, 2006).

The role of oral care in maintaining the health and wellbeing of mechanically ventilated patients in intensive care is evident. Oral care is considered as an important factor in reducing the incidences of VAP. Oral care refers to assessment of oral cavity, suctioning, care of endotracheal tube and direction of providing oral care (Nancy et al 2011).

Oral care must be considered as part of the assessment in intensive care units. The major focus should be on assessment of patients' oral cavity on admission as well as daily assessment of the lips, oral tissue, tongue, teeth and saliva of patient. The use of advanced tools, a comprehensive oral care protocol, and staff compliance with the protocol can significantly reduce the rates of VAP and associated costs related to VAP (Garcia, Jendresky, Colbert, Bailey, Zamen & Majumder, 2009). Oral assessment scores have been reported to improve after nurses implemented a protocol for oral care and use of Beck scale and the mucosal plaque score could be used as standardized oral assessment tool to guide nurses in providing oral intervention (Nancy, et al, 2011).

The assessment helps to identify oral cavity problems and also helps to determine the frequency of oral care (Safdar, Crinch & Maki, 2005). The AACN (2006) guidelines recommend assessment of the oral cavity and lip every 8th hourly in ventilated patients to assess the patients for potential risk of infection. VAP was found to be reduced to zero within a week of beginning the every eighth hourly oral care. However, the main complication of the patient with liver disease is risk of bleeding (Akron, 2008). Santos, Fernandes and Gallottini (2012) also stated that the majority (93.75%) of the liver diseases patient patients had abnormal coagulation and were at more risk of bleeding. Studies also emphasized that there should be proper oral assessment scale that can be successfully applied in liver disease patients to provide need based oral care (Lins & Bastos, 2014).

Literature related to incidences and Diagnosis of Pneumonia in Ventilated patients Diez, et al (2017) did a retrospective study using the Spanish national hospital discharge database from year 2010 to 2014 in Spain with aim to describe trends in the incidence of VAP and common causative organism for VAP among 9336 hospitalized patients. The data was analyzed by using Multivariable methods include Poisson regression. The software used for bivariate and multivariable analysis was Stata (Stata College Station, TX). The results stated that there was decrease in the incidences of VAP from 41.7 to 40.55 per 100,000 cases from 2010 to 2014. Results of study revealed that the most frequently causative organism found for VAP was *Pseudomonas* (5.68%), Gram-negative bacteria (4.93%), *Klebsiella pneumoniae* (2.89%), *Staphylococcus Aureus* susceptible to Methicillin (2.86%), *Candidiasis* (2.57%), *Streptococcus Pneumoniae* (2.32%), *Escherichia coli* (1.83%), *Haemophilus influenza* (1.74%), and *Staphylococcus Aureus* resistant to Methicillin (1.16%).

A prospective cohort study was conducted on 100 ventilated patients to determine the incidences of VAP in Intensive Care Unit of Tertiary Care Hospital in India. Clinical Pulmonary Infection Score was used to diagnose pneumonia. The patients, who died or developed pneumonia within 48 hours or those who were having pneumonia at the time of admission and patients with ARDS were excluded from the study. The statistical analysis was done by using Chi-Square test, Fisher test and paired t test. The incidences of VAP were found to be 30 percent. There were no significant association found between gender (p value-0.37), age (p value-0.92) and VAP infection. The results of study concluded that VAP patients have higher mortality rate, longer duration of mechanical ventilation and long duration of hospital stay than non VAP patients (Mohanty, Routray, Mishra & Das, 2016).

A study was done by Gadani, Vyas and Kar in 2010 to determine the incidence and risk factors for VAP in Intensive Care Unit of Territory care center Jamnagar, Gujarat among 100 ventilated patients. The

subjects were randomly allocated into study and comparison group. The Clinical Pulmonary Infection Score was used to diagnose the pneumonia. The patients were excluded from the study if the CPIS was ≥ 6 and had ARDS. The study group patients were classified into two groups, early onset of VAP (onset after 48 h but within 96 h) and late-onset VAP (onset after 96 h). Data was analyzed using the Chi-Square. The results revealed that 37 patients out of 100 developed pneumonia. The incidences of early onset of VAP were 27 percent and the late incidences of VAP were 73 percent among ventilated patients. The risk factor associated with VAP was duration of ventilator support, reintubation, supine position, advanced age and altered consciousness. The study concluded that the strategies to prevent VAP should be implemented in ICU to decrease the incidences of VAP and to reduce the ICU stay. Sharma, Singh, Pooni and Mohan (2009) conducted a prospective cohort study with an aim to determine the incidences of ventilator associated pneumonia among children at Dayanand Medical College and Hospital, a tertiary care teaching hospital in Ludhiana, Punjab, India. The study was conducted over a period of 18 months. The sample size was 40 ventilated patients. The diagnosis of pneumonia was made based on Temperature, Total leukocyte count, Purulent tracheal aspirates and evidence of new or persistent radiographic infiltrates. Results of study found 20 percent incidence of VAP. Out of this 50 percent of VAP was caused by *Escherichia coli*, 25 percent by *Staphylococcus Aureus* and 25 percent by *Acinetobacter*. The study conducted by Haghighi, Shafipour, Nesami, Baradari and Charati (2016), to identify the incidences rate of VAP used Clinical Pulmonary Infection Score to diagnose Pneumonia among Ventilated Patients. The results of the study revealed that the incidences of VAP were 10 percent in the study group and 14 percent in the Comparison group.

The reviewed studies showed the incidences of VAP ranged from 20 percent to 37 percent among ventilated patients. The most common risk factor for development of VAP was advanced age, duration of ventilator support, re intubation and supine position. The most common organism identified for the occurrence of VAP were *Klebsilla Pneumonia*, *Staphylococcus Aureus*, *Candidiasis*, *Escherichia coli*, *Acinobacter* followed by *Pseudomonas* and Gram Negative Bacteria. It was also found that Clinical Pulmonary Infection score was commonly used tool to diagnose Pneumonia among Ventilated patients.

Literature related to Assessment of Oral Health Status and Frequency of Oral Care A study conducted by Duzkaya, Uysal, Bozkurt and Yakut (2017) to evaluate the effect of oral care using an oral health guide in pediatric ICU at Medical University of Istanbul used Oral Mucositis scale developed by WHO to collect the data regarding Oral Health Status. The daily oral care was provided by the researcher based on the Oral care guide. The study conducted by Haghighi, Shafipour, Nesami, Baradari and Charati (2016), to evaluate the impact of oral care on Oral Health Status of Ventilated Patients used Modified Beck Oral Assessment Scale and mucosal plaque score to assess the Oral Health Status and MBOAS was also used to guide the frequency of oral care.

The study conducted by Estaji, Alinijad, Rakhshani and Rad (2016) with aim to compare the chlorhexidine solution and swab with toothbrush and toothpaste effect in terms of preventing oral lesion in hospitalized patients admitted in ICU used Modified Beck Oral Assessment Scale to assess the Oral Cavity.

Another study conducted by Batiha, Alhallaiqa, Bashayreh, Saifan, Zaru and Omran (2015) to explore the impact of implementing American Association of Critical Care Nurses Endotracheal Tube and Oral Care procedure (AACN ET & OC) used Modified Beck Oral Assessment Scale to assess and to determine the required number of Oral Care.

A systemic literature research was done by reviewing 304 articles on practice of Oral Hygiene in mechanically Ventilated Patients. Data was collected from Pub Med, EBSCO HOT databases with the keyword oral hygiene, Oral Hygiene practice, mouth hygiene, intubated and mechanically ventilation. In conclusion it is concluded that oral care is an important nursing practice in prevention of VAP, however there is no standard oral health evaluation tool and there is no clarity regarding oral care frequency (Atay, 2014).

In the other study conducted by Nancy, Sulima, Soeken and Wallen (2011) to assess the effect of systematic oral care in critically ill patients

used Modified Beck Oral Assessment Scale to assess the Oral Cavity and to determine the frequency of Oral Care.

The reviewed study concluded that different types of scales was used by the researcher for assessment of Oral Health Status among ventilated patients like Mucosal Plaque Score, Oral Care guide, Oral Mucositis scale and Modified Beck Oral Assessment Scale. Among all the scales MBOAS was commonly used scale for assessment of Oral Health Status and to determine the frequency of Oral Care among Ventilated Patients.

Literature related to role of oral care protocol and guidelines in prevention of VAP Oral care is an important nursing intervention. Oral care would not only improve patient's oral health and well-being, but it also reduces the incidence rate of ventilator-associated pneumonia (Sharma et al 2009).

Haghighi, et al (2016), did a clinical trial to assess the impact of oral care on oral health status and to identify the incidences rate of VAP among critically ill patients at Mazandaran University of Medical Sciences, Iran. Hundred patients were randomly assigned to intervention and control group. Clinical Pulmonary Infection score was used to diagnose pneumonia. The Oral Cavity was assessed using Modified Beck Oral Assessment Scale and Mucosal Plaque score. MBOAS was used to assess the Oral Cavity and to determine the frequency of Oral Care. The Oral care protocol includes adjusting Endo tracheal Tube cuff pressure; moisten the lip and brushing the teeth. The results of studies revealed that the MBOAS score showed significant differences between the two groups from the first to fifth day ($P < 0.001$). The results of study also stated that the incidence rate of pneumonia on the third and fifth day was 10 percent and 14 percent in the control group, and 4 percent and 10 percent in the intervention group, although the results was not statistically significant ($p = 0.538$). The study concluded that systematic oral care was not found effective in reducing the incidences of VAP.

An evidence-based research project was done by William (2015) with a purpose to implement an evidence-based oral care protocol for mechanically ventilated patients to decrease the incidence of ventilator-associated events at Valparaiso University Indiana.

The oral care protocol includes mechanical brushing, use of Chlorhexidine solution, timely oral assessment and MBOAS to guide the oral care. The study was conducted in Medical Intensive Care Unit of four community hospital in Midwest. Single group pre-test post-test design was used. The monthly VAP incidences rate of each ICU was reported for 13 months. Results of study showed that the mean incidence rate of VAP was declined by 1.8 cases per 100 ventilator-days in the post-test. However, the decline in incidences of VAP was not statistically significant ($\chi^2 = 0.37$, $p = 0.54$). The study concluded that timely oral assessment, mechanical brushing and use of chlorhexidine solution reduce the incidences of VAP.

Binkely, Furr, Carrico and Curren (2004) conducted a oral survey to assess the practices of Oral Care in Intensive Care Unit of United States. One hundred two ICU was randomly selected. The sample size was 556 registered nurses. The knowledge and attitude of nurses regarding frequency of oral care, type of Oral Care provided was assessed using structured questionnaire. The results of the study concluded that 92 percent of the nurses perceived oral care as a high priority. The common method of providing Oral Care was foam swabs, moisturizers, and mouthwash. Majority (80%) of the nurses reported Toothpaste and toothbrushes were less commonly used method of providing Oral Care. Most of the nurses indicated that there is need for evidence based proven Oral Care. The study concluded that the Oral Care method were not evidenced based.

Schelder, Stott and Lioyd (2002) undertook a retrospective study to evaluate the impact of a comprehensive oral care protocol on the VAP rate in adult ICU patients on Shepherd hospital. The population for the study was adult ICU patients who were mechanically ventilated for at least 24 hours. A diagnosis of pneumonia was based on National Nosocomial Infections Surveillance System (NNIS) criteria. Pre and post comparison test were computed using Statistical Process Control (SPC) methods. Results of study revealed that VAP rate during the baseline period was 5.6 per 1,000 ventilator days with the comparative reference mean rate from the NNIS database being 9.9 per 1,100 ventilator days. After the protocol was introduced, the rate dropped to

2.2 per 1,000 ventilator days with the comparative reference mean rate from the NNIS database being 8.7 per 1,000 ventilator days. The results of study concluded that effective and evidence based oral care reduce the incidences of VAP, reduce the cost of treatment and hospital stay.

Orr and Mitchell (2018) did a study to evaluate the effectiveness of comprehensive oral care hygiene protocol in prevention of pneumonia at Nebraska Methodist Hospital, Omaha, Nebraska between the periods April 2006 to July 2006. A new protocol for comprehensive oral care was initiated. The oral care protocol was adopted from Center for Diseases Control and Prevention. The comprehensive oral care was given twice a daily. Result of study revealed that 45% reductions in occurrence of Pneumonia occur from April 2006 to July 2006. The study concluded that Pneumonia rates decrease after implementation of Oral Care Protocol.

Duzkaya, Uysal, Bozkurt and Yakut (2017) conducted a prospective study to evaluate the effect of oral care using an oral health guide in pediatric ICU at Medical University of Istanbul. Thirty-four patients were enrolled in the study. Single group study design was used. Daily oral care was implemented in the study group based on the oral care guide developed by the researcher. Data related to oral health were collected by using oral mucositis assessment scale developed by WHO. Results showed that oral mucositis occurred in 5.2 percent patients in pre-intervention group while it was 2.5 percent in the post intervention group. Although the more patients were having oral mucositis before intervention but the results were not statistically significant ($p=0.067$). Results of study concluded that oral mucositis can be reduced by implementing oral care in accordance with oral healthcare guidelines.

Hamuro, Kawaguchi, Yamazoe, Honda and Tanaka (2017) conducted a non-randomized controlled trial with purpose to assess the role of oral care in prevention of pneumonia in Japan. Two hundred sixty-three patients were enrolled in study group and two hundred fifty three patients were enrolled in the control group. The patients in the study group received standardized oral care intervention based on the status of the oral cavity and the control group received non-standardized oral care. The patients were compared based on sex, age, past history of diseases of the respiratory system, hypertension, diabetes, hyperlipidemia, heart impairment, and pneumonia. No statistically significant differences were found between the two groups in the distributions of characteristics except pneumonia. The results of the study also stated that presence of pneumonia was significantly associated with age and the lack of the standardized oral hygiene intervention. The study concluded that standard oral hygiene intervention was appeared to be effective in prevention of VAP. Moustafa, Tantawey, Soussi and Ramadan (2016) undertook a study to determine the effect of oral care intervention on occurrence of VAP at Mansoura University, Egypt. Quasi experimental time series design was used. Sample size was 60 (30 in each group). The patients in control group received routine nursing oral care while in the study group patients received oral care using toothbrush and chlorhexidine. CPIS was used to diagnose pneumonia and the oral health status was assessed using MBOAS. Oral care intervention as per American Dental Association was provided twice a daily for six days. Results revealed that a statistical significant difference was found between both groups in terms of occurrence of VAP ($p=0.001$). There were also highly statistically significant differences ($\chi^2=27.15$, $p<0.001$) seen in oral health of study and comparison groups after completion of oral care intervention. On six day more than half (76.7%) of patients in the control group suffered from severe oral alteration compared to 10 percent patients in the study group. The study concluded that comprehensive oral care was effective in improving oral health status and reducing VAP.

Estaji, Alinijad, Rakhsani and Rad (2016) conducted a clinical survey to compare the chlorhexidine solution and swab with toothbrush and toothpaste effect in terms of preventing oral lesion in hospitalized patient admitted in Intensive Care Unit at university of Medical Sciences, Iran. Thirty patients were enrolled in the study group using target based approach. MBOAS and mucous plaque score were used to assess the oral cavity.

The odd ratio was computed. The results stated that there was an association seen between use of toothbrush and Oral Health level (OR: 1.52). There was no difference found between the groups in prevention

of lesion in the gums, lips and tongue while it was found significant in removal of plaque with an odd ratio of 3.94. From the study it was concluded that use of toothbrush in Oral Care was effective in improving the Oral Health Status.

Batiha, Alhallaiqa, Bashayreh, Saifan, Zaru and Omran (2015) did a quasi experimental study to explore the impact of implementing American Association of Critical Care Nurses Endotracheal Tube and Oral Care procedure (AACN ET & OC) on the rate of Ventilator-associated pneumonia. MBOAS was used to assess and guide oral care. APACHE II was used to evaluate the Intensity of Illness. Study concluded that AACN ET and Oral care was effective in reducing VAP rate, time of starting VAP, and consequently reduce mortality rate. The study also stated that existence of different oral care protocols indicates that there is a need for a standardized oral care protocol.

Amriam, Aied and Arshed (2015) undertook a prospective controlled study to evaluate the effect of two different oral care interventions on the occurrence of VAP on General Intensive Care Unit of Israel. Ninety patients were alternately allocated to study and comparison group. The patients in the study group received comprehensive oral care included tooth brushing, suctioning, sodium bicarbonate, rinsing with an antiseptic solution containing 1.5% hydrogen peroxide and a mouth moisturizer while the patients in the comparison group received routine oral care with a sponge and atraumatic clamp, and rinse with a 0.2% solution of chlorhexidine gluconate. National Health Safety Care Network criteria were used to diagnose the VAP. Results revealed that among ninety patients 8.9 percent patients in the study group developed VAP as compared with 33.3 percent in the comparison group ($p<0.06$). The results also stated that the hospitalization stay was also reduced in the study group. The study concluded that the comprehensive oral care was more effective in reducing the VAP than the routine oral care.

Nancy, Sulima, Soeken and Wallen (2011) undertook a quasi experimental study to assess the effect of systematic oral care in critically ill patients. Convenient sampling technique and pre-test-post-test study design was used. MBOAS and mucous plaque score were used to assess the oral cavity. In the study group the oral care was provided according to protocol which includes assessment of oral cavity, suctioning, care of endotracheal tube and direction of providing oral care. The patients in the comparison group received routine oral care. Data were analyzed by using linear mixed modeling.

Results revealed that scores on MBOAS differed significantly ($F=4.79$, $P=.01$) across three days in study group. From the study, it is concluded that oral assessment scores improved after nurses implemented a protocol for oral care and use of Beck scale and the mucosal plaque score could be used as standardized oral assessment tool to guide nurses in providing oral intervention.

Garcia, Jendresky, Colbert, Bailey, Zamen and Majumder (2009) conducted a study to determine the effect of implementing a comprehensive oral care protocol on the rate of VAP. The patients were prospectively followed for VAP occurrence for a period of 24 months. The demographic data and APACHE II were collected at the time of admission. The patients were divided into control and interventional group. Patients in the control group had no oral assessment, no suctioning of the oral cavity of subglottic spaces as needed. The patients in the intervention group received oral care as per protocol which includes assessment of the oral cavity and deep suctioning. Results of study concluded that there was a decrease in the VAP rate by 4.1 percent although the results were marginally significant. The study concluded that use of advanced tools, a comprehensive oral care protocol, and staff compliance with the protocol can significantly reduce the rates of VAP and associated costs related to VAP.

Akron (2008) undertook a study project to evaluate the effectiveness of oral care intervention to reduce the incidences of VAP at USA. The aim was to support that timely oral care can mitigate and prevent the occurrence of VAP. Patients were randomly assigned to control and interventional group. The interventional group received oral care every eighth hourly and the comparison group receive routine oral care. Results showed that VAP was reduced to zero within a week of beginning the every eighth hourly oral care.

Munro, Grap, Elswick, McKinney, Sessler and Rusella (2006) conducted a descriptive study to assess the oral health status and

development of VAP. The objective of the study was to describe the relationship between VAP and Oral Health Status. Sixty six patients were enrolled in the study and followed for seven days. Data related to Oral Health Status was assessed by using Clinical Pulmonary Infection Score at baseline, fourth and on seventh day. APACHE II score was used to assess the severity of illness. Results of study showed that correlation of oral health status and VAP was found significant ($r=0.06$, $p=0.01$). The study concluded that high dental plaque and high severity of illness confers greater risk of developing VAP.

Houston, Paul, Jacqueline, Anderson and Rocco (2002) conducted a prospective case controlled clinical study to assess the effectiveness of 0.12 percent chlorhexidine gluconate oral rinse in reducing the prevalence of nosocomial pneumonia. Random allocation was used to enroll 561 patients. The patients with respiratory infection were excluded from the study. The scoring tool which was used to diagnose the pneumonia include nature of tracheobronchial secretions, evidence of fever, degree of leukocytosis, microbial culture results, and evidence of pulmonary infiltrate. Results revealed that overall incidences of pneumonia were reduced by 52 percent (p value 0.02) in the study group.

Kowalczyk, Kowalczyk, Slawinska, Dadalski, Kostewicz and Pawlowska (2014) conducted a study with an objective to assess the oral health among 35 children and adolescent with cirrhosis. Clinical examination was performed to assess the oral mucosa, oral hygiene, gingiva and teeth. Oral mucosa was assessed for lesions based on WHO Guide to Epidemiology and Diagnosis of Oral Mucosal Diseases. Oral hygiene was assessed using dental plaque index and gingival health was assessed using Silness gingival index. Results revealed that 74 percent patients had mucosal lesion, 62.5 percent had gingivitis and 20 percent patients presented with oral and gingival mucosa discoloration. The results of the study concluded that Oral mucosal lesions were commonly found in children with cirrhosis of the liver.

A study conducted by Santos, Fernandes and Gallottini (2012) for assessing and managing the oral health in liver diseases patient and also studied the prevalence of oral disease and abnormalities in patients with liver diseases at Special Care Dentistry Center of the University of Sao Paulo. The sample size was 32 patients, 16 in the study group having liver diseases, 16 in comparison group having no liver diseases. The patients in the both groups were assessed for oral abnormalities using structured questionnaire. Coagulation studies like prothrombin time (PT)/International Normalization Ratio (INR), activated partial thromboplastin time (aPTT) and platelet count were performed on all patients. The finding of the study revealed that the incidences of oral diseases was more ($p=0.03$) in the study group. It was also found that the majority (93.75%) of the patients had abnormal coagulation and was at more risk of bleeding. The study concluded that the oral assessment and oral care should be done carefully in patients with liver diseases as there is an increased risk of developing oral mucosal lesion in these patients.

Pamplona, Munoz and Perez (2011) undertook a study to review the dental consideration in patients with liver diseases at Warsaw Medical University, Poland. The objective of the present study was to review the literatures related to the oral manifestations that can be found in patients with viral hepatitis, alcoholic and non-alcoholic liver disease, and cirrhosis and hepatocellular carcinoma. Twenty eight articles were reviewed which included twenty literature reviews, a clinical guide, three clinical trials and four case series. Results revealed that the major oral clinical manifestation observed in patient with liver diseases is xerostomia, lichen planus and bleeding disorder. The main complication of the patient with liver disease was found to be risk of bleeding.

A study was conducted at Medical University Sofia, Bulgaria with an aim to assess the oral health status in patients with liver diseases. Twenty five patients with Chronic Hepatitis B, C and patients with cirrhosis were included in the study.

Gingivitis was assessed by using Papilla bleeding index. Dental caries and dental hygiene was assessed by using debris index. Results revealed that 85 percent of patients with hepatitis had poor oral health, 45 percent patients had periodontitis and 15 percent had gingivitis (Panov & Krasteva, 2011).

The literature reviewed related to Oral Health in Liver Diseases patients highlighted the greater risk of bleeding and poor oral health status. The major oral manifestation observed in these patients was gingivitis, Xerostomia and mucosal lesion and mucosal discoloration. Hence it can be inferred that oral assessment and oral care has to be done carefully to avoid complication related to bleeding in Liver diseases patients.

Conclusion

The patients admitted in Intensive Care unit are severely ill especially the patients with Chronic Liver Disease. These patients are high risk patients and are at more risk of bleeding. In ICU the information regarding techniques of Oral Care and frequency of ideal oral care practices is required and their usefulness in oral care practices for patients with an Endotracheal tube, so as to challenge the practices that are no longer required in the ICU.

Reviewed articles advocate that VAP is the major cause of hospital morbidity and mortality. Reviewed literature concluded that MBOAS was most common scale used in Ventilated Patients to assess the Oral Health Status and to determine the frequency of the Oral Care. Most studies used Clinical Pulmonary Infection Score to diagnose the patients for Pneumonia. APACHE II score was most commonly used score to assess the Severity of Illness.

From the reviewed study, it can be interpreted that a variety of Oral Care Protocol has been used by the researcher in their studies. Chlorhexidine solution has been used as a commonly antiseptic solution to provide Oral Care. A need of standardized Oral care guidelines was identified. It was also found that implementation of Oral care Protocol and standardized Oral Assessment scale can reduce the incidences of VAP. Moreover, the literature also highlighted the need to assess the frequency of providing Oral Care.

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