



Clinical Progress Research on Oral Care for Patients with Critical Illness

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DOI: 10.32629/ajn.v3i2.1121

Abstract: In the nursing of patients with critical illness, the oral health of patients will be seriously affected because it is difficult for patients to complete oral care independently. Various microbial pathogens are deposited in patient biofilms as well as in oral secretions and are continuously transmitted. Under the condition of positive pressure ventilation, these pathogenic bacteria will enter the lower respiratory tract of patients, leading to nosocomial pneumonia infection in patients. This will not only significantly prolong the ICU stay time of patients, but also increase the mortality rate of patients. Therefore, it is necessary to strengthen the oral care of patients to reduce the number of bacteria in the patient's pharynx. This is one of the important methods to prevent nosocomial pneumonia infection in patients. For this reason, this article studies the clinical progress of oral care for patients with critical illness, in order to provide some reference for relevant personnel.

Keywords: patients with critical illness, oral care, clinical progress

1. Introduction

Due to the influence of temperature, humidity, food residue and other factors, the human oral cavity is very suitable for the growth and reproduction of various microorganisms. Because the oral cavity communicates with the outside world, it is one of the important ways for external pathogenic microorganisms to invade the human body. Especially for patients with critical illness, due to their weak body resistance, it is difficult for patients to effectively resist the invasion of pathogens. This eventually leads to rapid multiplication of various germs in the patient's mouth, leading to lung inflammation in the patient. Therefore, it is of great value to strengthen the oral care of patients with critical illness. Relevant personnel must pay attention to this.

2. Oral health status of patients with critical illness and the occurrence of pneumonia

In the care of patients with critical illness, especially for patients with critical illness who have been in a coma for a long time, patients with intubation or ventilators, because the amount of saliva secretion in these patients is significantly reduced, bacteria are more likely to spread in the teeth, oral mucosa, etc. Parts are attached, resulting in a large number of accumulations. It is difficult for these patients to complete oral care independently, which will have a great impact on their oral health. The use of intubation will cause damage to the oral mucosa of the patient, which will damage the normal defense mechanism of the patient's body and make the existing oral infection of the patient more complicated. Various factors such as severe periodontal disease, dental caries, and swallowing disease will lead to further deterioration of the patient's oral health, resulting in the proliferation and spread of various microorganisms in the patient's oral cavity. After the pharyngeal fluid is inhaled into the patient's lower respiratory tract and lungs, it will lead to lung infection in the patient.

2.1 Study on the etiology of nosocomial pneumonia infection in patients with critical illness

An analysis of the causes of nosocomial pneumonia infection in patients with critical illness will reveal that the patient's mouth can complete the isolation of pathogenic bacteria that cause respiratory tract infections in patients. In the study, relevant scholars found that 65% of the patients had respiratory pathogens in the dental plaque or oral mucosa of 34 ICU patients after studying the oropharyngeal extracts. A study of 25 oral disease patients of the same age during the same period found that only 16% of the patients had the same situation [1].

Relevant scholars pointed out in the report that in the patient's dental plaque, there are respiratory pathogens, which may be one of the important causes of hospital-acquired pneumonia (HAP) in intubated patients. Systematic evaluation of the patient's oropharynx and oral hygiene are of great value in preventing severe oropharyngeal infection and pulmonary infection. Relevant research results have shown that the pathogenic bacteria that cause respiratory tract infection problems in patients may exist in plaque. Therefore, the control and removal of plaque can effectively reduce the probability of pneumonia infection in intubated patients. Plaque is the bacterial biofilm that covers a patient's living organism, inside the patient's mouth. It is mainly located on the tooth surface, periodontal pocket, soft tissue surface and denture. During care,

plaque is difficult to remove by gargling and light wiping. Plaque is a complex and dynamic bacterial ecosystem, and aerobic bacteria and various anaerobic bacteria will multiply in the plaque. According to statistics, there are about 108 bacteria per cubic millimeter of plaque. And in the study, it was found that plaque contains about 700 different kinds of bacteria. Plaque is a major risk factor for ventilator-associated pneumonia (VAP), and this conclusion has been accepted by most workers [2].

The results of the investigation of the oral status of patients with critical illness in the ICU show that with the gradual extension of the ICU stay time of the patients, the number of plaques in the patients' oral cavity will gradually increase, resulting in the extreme proliferation of microorganisms in the pharynx of the patients. Under ventilation conditions, these pathogenic bacteria can easily enter the patient's lower respiratory tract and lungs, leading to VAP in patients.

2.2 Study on the Incidence and Fatality of Ventilator-Associated Pneumonia

In the care of patients with critical illness in the ICU, VAP has a high incidence rate, which will largely lead to prolonged hospital stay and increase the mortality rate of patients. Relevant scholars found that 50% of patients with early onset infectious pneumonia were VAP after studying 1014 mechanically ventilated patients. Most of the pathogenic flora that cause this problem in patients belong to the normal oropharyngeal flora. In addition, related reports pointed out that every 1000 days of mechanical ventilation will lead to 10-42 patients with VAP. VAP can significantly prolong the stay of ICU patients, and make the mortality rate as high as 16%-94%. The American Thoracic Society proposed in the guidelines on nosocomial pneumonia that the mortality rate of VAP is between 33% and 50% [3].

And there is a close link between poor oral health and VAP. Regular professional oral care for patients and improvement of their oral condition can greatly reduce the probability of VAP in patients with critical illness.

3. Strengthening oral care and controlling the strategy analysis of patients with nosocomial pulmonary infection

At present, in the oral care of patients with critical illness, in order to effectively prevent nosocomial pneumonia infection in patients, there are mainly two ideas. The first is to prevent secretions from the oropharynx from entering the patient's lower respiratory tract, and the other is to reduce the number of bacteria that cause oropharyngeal contamination in the patient.

3.1 Effect analysis of measures to prevent oropharyngeal secretions from entering the lower respiratory tract

According to literature reports, in order to prevent secretions from the oropharynx from entering the patient's lower respiratory tract, the patient can be placed in a semi-recumbent position during patient care for continuous subglottic suction, thereby preventing the patient from developing VAP. In the research, relevant scholars ensured that the patient's upper body can be slowly turned from one side to the other side within a range of 90 degrees by using a hospital bed with sustainable lateral rotation, and then return to the same side at the same time. This repeated, can effectively prevent patients with VAP. In the study, it was found that the incidence of VAP in the control group was 23%, while the incidence of VAP in the group using continuous lateral rotation beds was 11%, with a significant difference [4].

However, some scholars believe that adjusting the body position to prevent secretions from entering the patient's respiratory tract is not clinically effective and can only be used as an auxiliary means in clinical practice. Relevant scholars have studied the influence of semi-recumbent and normal recumbent positions on the incidence of VAP in patients with critical illness. The results show that semi-recumbent position is difficult to prevent the occurrence of VAP. It is also difficult to prevent secretions from entering the patient's lower respiratory tract by suction. Therefore, in recent years, many scholars are actively studying how to reduce pharyngeal microbial colonization. The main nursing methods include the application of disinfectants, application of antibacterial drugs, brushing teeth and other nursing measures, etc. [5].

3.2 Application Analysis of Antibacterial Drugs

In clinical comparisons, it was found that topical application of antibiotics was of great help in reducing the rate of microbial colonization and the incidence of VAP in patients, and at the same time it could effectively avoid the adverse effects of systemic application of antibiotics on patients. Relevant scholars reported in their research that for 5939 patients with critical illness, different nursing programs were selected for nursing. The SDD care regimen mainly includes intravenous cefotaxime and tobramycin, colistin, and amphotericin B in the patient's oropharynx. The SOD program only chooses to apply the above antibiotics in the patient's oropharynx. After comparing the above two programs with the standard care group, it was found that the two care programs were significantly lower than the standard care group in terms of the drug resistance rate of Gram-negative bacteria and the use of antibiotics. At the same time, the time of mechanical ventilation of

patients is significantly shortened, and the time of ICU stay of patients is also reduced. Both regimens reduce mortality in patients with critical illness. Considering the importance and challenges of drug resistance to ICU patients, compared with the SDD regimen, the SOD regimen is more suitable for the routine long-term application of patients clinically.

3.3 Analysis of the role of disinfectants

In the oral care of patients with critical illness, rational use of disinfectants can effectively reduce the colonization of pathogens in the oral cavity of patients, and also play an important role in controlling the risk of nosocomial infection in patients. Commonly used disinfectants in clinic mainly include chlorhexidine gargle, gel preparation, iodophor and so on. Relevant scholars pointed out in their research that although the application of plaque disinfectants cannot solve the problem of respiratory system infections caused by multi-drug resistant bacteria, it can effectively reduce the colonization rate of pathogenic bacteria in the oropharynx of intubated patients. The effects of chlorhexidine alone, chlorhexidine placebo alone, and the combination of chlorhexidine and colistin were compared. Chlorhexidine and colistin have good inhibitory effects on both Gram-positive and Gram-negative bacteria in practical applications. The incidence of VAP was 18% in the placebo group; 10% in the chlorhexidine group alone; and 13% in the combined application group. Using chlorhexidine alone, compared with the placebo group, the incidence of VAP decreased by 65%; combined application of chlorhexidine and colistin, the incidence of VAP decreased by 55%. The simple application and combined application of chlorhexidine can effectively reduce the incidence of VAP in patients. However, clinically, it is more economical and reasonable to use chlorhexidine alone to prevent VAP in patients with critical illness. At the same time, the American Association of Intensive Nurses also recommends using 0.12% chlorhexidine gluconate to nurse the patient's oral cavity twice a day, which can effectively reduce the incidence of VAP in patients [6].

In clinical reports, for patients with critical illness with severe head injuries, in the oral care of patients, povidone iodine is used to wipe the patient's nose and pharynx every 4 hours, and normal saline is used to wipe the patient's nasopharynx. In contrast, both of them cleaned up the secretions in the patient's mouth. The results of the study showed that the incidence rate of VAP was 8% in the group that was wiped with povidone iodine, and 39% in the group that was wiped with saline. It has been shown that swabbing the oral cavity with povidone iodine can effectively reduce the incidence of VAP in patients with severe head injury [7].

4. Analysis of the benefits and limitations of oral care in application

In care for patients with critical illness, xerostomia is one of the most frequent and disturbing conditions in the care of patients receiving non-invasive ventilation. In patient care, taking effective oral care measures can effectively reduce this symptom and achieve good nursing results. However, there are certain limitations in the application of conventional oral care, and there are certain potential risks. For patients with critical illness, due to the rapid change of the patient's condition, if oral care is given to the patient, the risk of adverse events may increase. For patients with non-invasive ventilation, switching to another device for oral care may lead to hypoxemia in patients, which will bring significant risks to patients [8].

5. Future direction and suggestion analysis

Chlorhexidine gluconate is needed as a clinically researched solution in the oral care of patients with critical illness. This way of care is more likely to be accepted by patients with critical illness in application. For nursing staff, the best nursing effect can be achieved by performing oral care on patients twice a day. In nursing, it is necessary to determine the nursing qualification standards, clarify the various risk factors of patients in nursing, and reduce the various risks of oral care [9]. Nurses need to work in an interdisciplinary team to identify which patients with critical illness are best candidates for oral care. They also assess the actual condition of the patient. The evaluation content mainly includes the patient's diet status and lung stability, etc. After the patient's condition is stable enough, when performing oral care activities, it can temporarily switch to a high-flow nasal cannula instead of an oxygen device. This can effectively control the problem of pneumonia in patients with critical illness [10].

6. Conclusion

To sum up, in the nursing of patients with critical illness, strengthening the oral care of patients is one of the common measures to prevent patients from hospital-acquired pneumonia, and it is also of great help to improve the comfort of patients. However, the oral care of patients is also likely to lead to a significant increase in the risk of adverse events in patients, so nurses must accurately assess the actual situation of patients to reduce the risk of oral care for patients. Only in this way can the true value of oral care be brought into full play and reduce the chance of hospital-acquired pneumonia in patients with critical illness.

References

- [1] Wang Xiaoping. The application value of active silver ion antibacterial liquid combined with negative pressure oral aspirator in oral care of patients with critical illness [J]. *Medical Equipment*, 2022,35(20):165-167.
- [2] Yang Ting, Yao Yan, Li Xinhuan. The influence of different first oral care time on the incidence of premature VAP and the effect of oral care in patients with tracheal intubation [J]. *International Journal of Nursing*, 2022, 41(19): 3628-3631.
- [3] Ni Ruizhe. Study on the Influence of Comprehensive Oral Nursing on ICU Patients with Mechanical Ventilation [J]. *China Urban and Rural Enterprise Health*, 2022,37(9):124-126.
- [4] Chen Jing. Application of oral care based on dynamic assessment of dental plaque index in patients with nasal feeding in the acute stage of stroke [J]. *Practical Integrative Medicine*, 2022, 22(13): 112-114+121.
- [5] He Shuhong. Experience in clinical practice of oral nursing for patients with critical illness with endotracheal intubation [J]. *Chinese Medicine and Clinic*, 2021, 21(8): 1403-1405.
- [6] Liang Xiujian, Chen Yingzi, Duan Wenjun, Tang Wenying, Ma Chunyuan. Oral nursing methods and drug solution selection for patients with critical illness through nasotracheal intubation [J]. *Chinese Medicine Innovation*, 2020, 17(28): 113-116.
- [7] He Jiahui. Observation on the Effect of Pharyngeal Cold Stimulation Combined with Oral Nursing in Preventing Dysphagia and Lung Infection in patients with critical illness with Cerebral Hemorrhage [J]. *Medical Diet Therapy and Health*, 2020, 18(11): 146+148.
- [8] Zhang Yu, Chen Qinmei, Ma Yunhong, Xu Ya, Liao Wenyu. Application of electric toothbrush irrigation in oral care of patients with critical illness [J]. *Psychology Monthly*, 2020, 15(14): 167.
- [9] Yu Mingxiang. A meta-analysis of oral irrigation for oral care in patients with critical illness with endotracheal intubation [J]. *Everyone's Health*, 2020, (6): 163-164.
- [10] Zhang Ya, Li Shuangshuang, Qin Xiaoxiao, Chen Feifei, Xin Ning, Tang Hua, Gao Wei. Difficulties in Oral Nursing Operation of ICU Patients with Orotracheal Intubation and Influencing Factors [J]. *Chinese Medicine Guide*, 2022, 20(02):83-85+89.