

ORAL-DENTAL HEALTH PROTOCOLS IN PEDIATRIC INTENSIVE CARE UNITS

Çocuk Yoğun Bakım Ünitelerinde Ağız-Diş Sağlığı Protokolleri

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ABSTRACT

Pediatric intensive care units are places where thousands of children take treatment for various reasons every year. Critically ill children need to be well-cared for getting better and they need to be protected from hospital infections. Many studies have shown that Ventilator Associated Pneumonia (VAP) is one of the most important causes of hospital infections and its incidence can be reduced by good oral care. Although oral care contains daily oral assessments and determination of the individual needs, brushing teeth, mouth moisturizing and mouthrinse use, many nurses prefer foam sticks to toothbrushes. In addition, the optimal frequency of oral health care applications is also a question. There are investigations about adult patients generally, but few research about children. For this reason, new researches about protocols for oral health care of hospitalized children are needed.

Keywords: *Pediatric intensive care, oral health, protocol, dental health*

ÖZ

Çocuk yoğun bakım üniteleri her yıl binlerce çocuğun çeşitli sebeplerden dolayı bakıldığı yerlerdir. Kritik durumdaki çocukların genel durumlarının düzelmesi için bakımlarının iyi bir şekilde yapılması ve çocukların hastane enfeksiyonlarından korunması gerekmektedir. En çok görülen hastane enfeksiyonlarından birinin Ventilatörle İlişkili Pnömoni (VİP) olduğu belirtilmektedir. VİP insidansının iyi bir oral bakım ile azaltılabildiği pek çok çalışma ile gösterilmiştir. Oral bakım; diş fırçalamayı, ağız nemlendirmeyi, gargara kullanımını ve hastanın ihtiyacına göre günlük oral değerlendirmeyi içermesine rağmen hemşirelerin çoğu diş fırçası yerine köpük çubukları ve gaz tamponu tercih etmektedir. Bunun yanı sıra bu uygulamaların sıklığı da tartışma konusudur. Yapılan araştırmalar genellikle yetişkin yoğun bakımları ile ilgili olup çok azı çocuk yoğun bakımı ile ilgilidir. Bu nedenle çocuk hastaların ağız-diş sağlığı protokolleri hakkında yeni çalışmalara ihtiyaç duyulmaktadır.

Anahtar kelimeler: *Pediyatrik yoğun bakım, ağız sağlığı, protocol, diş sağlığı*

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Introduction

Intensive care units (ICU) where critically ill patients with poor general condition are monitored are units. Patients in the ICU have many factors of the host and the environmental that can lead to hospital infections (HI) (1). In recent years, "quality" and "ensuring the security of patient" are two main objectives in the health sector. Considering the targets, it has known that a protocol about health-associated applications must be established (2). From this perspective, oral-dental health protocols in pediatric intensive care units (PICU) must be established because of maintaining quality and ensuring the security of patient.

Aytac et al. (3) reported that the level of knowledge of the nurses working in adult ICU and PICU about preventing HI more than the nurses in other units. In light of all, it is showed that the children in ICU need special professional care (3).

Ventilator-associated pneumonia (VAP) is account for 90% of annual 300,000 cases of hospital-associated pneumonia (4, 5). Compared with adult ICU patients, PICU children have a number of differences that may increase their risk of developing VAP (6, 7). Although, all of the evidence-based VAP prevention protocols do not recommend the same procedure, all of them include the comprehensive oral care /oral hygiene interventions (8-11).

VAP and Pediatric Intensive Care Units:

VAP is known as the second biggest reason of HI. It is known that there is more gram (-) bacteria [especially *Pseudomonas aeruginosa* (P.a.) and *Klebsiella pneumonia* (K.p.)] in microbiology of VAP. It is indicated that P.a. is the most common bacteria, and it is seen in the cases by 22% (6, 12-13).

HI in ICU and Bacterial Contamination:

Oropharyngeal is known to be the main reservoir for bacteria colonization on the upper respiratory tract (14, 15). It is reported that there is a relationship between poor oral hygiene and nosocomial pneumonia particularly in intubated patients (16-19).

Scannapieco and his colleagues (20) stated that pulmonary pathogens such as K.p. and *Serratia marcescens* are isolated in dental plaque of ICU patients, while they are not isolated from dental clinic patients. Fourrier et al. (21) had a prospective study in which they had evaluated 65 ICU patients. In this study, it is reported that the dental plaque which is at the level of 40% at patient admittance is increasing during the intensive care period. Scannapieco (22) reported that the pathogen causing to pneumonia initially colonize in dental plaque. The study of Didilescu et al. (17) regarding to the bacteria colonization in oral cavity formed by respiratory tract pathogens showed that P.a. is isolated in tongue, yet not isolated in dental plaque.

Selective orofarengeal decontamination (SOD) in ICU patients:

Pineda et al. (23) claimed that performing CHX twice a day in order to prevent VAP does not outperform performing it once a day. The study conducted by Scannapieco et al. (24) with the same purpose, on the other hand, indicated that using 2% chlorhexidine gluconate (KHG) instead of 0.12% KHG make a significant difference in relation to decrease in number of *Staphylococcus aureus*.

Oral Hygiene Care in Pediatric Intensive Care Units

A patient's oral care needs of the individual should be determined at admission to

hospital. However, it is hardly implemented in practice (25). Besides, it that oral care practices conducted by nurses is inconsistent and highly variable. Nurses, reach to oral cavity of some patients (tubes, strips or bite blocks due to the presence of) difficultly. Some patients also does not allow the nurses to sustain oral hygiene. For these reasons, it has not been maintained oral hygiene in intensive care patients (25, 26). Although the standard oral care maintain, the levels of plaque accumulation and the frequency of bacterial colonization have increased during hospitalisation in intensive care. This situation has explained by the absence of a comprehensive oral care (27, 28).

Comprehensive Oral Care:

‘The application and development of comprehensive oral care program, oral hygiene and decontamination with antiseptic agents’ have been discussed whether require or not in Centers for Disease Control and Prevention’s pneumonia-related guide (20).

Mechanical and pharmacological oral care interventions aim to remove dental plaque and debris from the oral cavity (29-31). In clinical guideline of The Association of Infection Control and Epidemiology Professionals, oral hygiene is defined as ‘frequent brushing your teeth, using a suction device and cleaning the mouth with antiseptic agents’ (32). Munro et al. (29) indicated that the incidence of VAP reduced to 57.6% by the implementation of a comprehensive oral hygiene. Shay et al. (33) indicated that the patients given oral care come down with pneumonia 42% less than the ones not given oral care. In this study, it is also claimed unless the patient are given comprehensive oral care, dental plaque progress on tooth within 72 hours, and this causes to gingivitis (29, 34-35).

1 Oral Assessment:

An evidence-based protocol for oral care in intensive care units has been attracted for creating (10, 27). Therefore, ‘BRUSHED Teeth’ evaluation model is recommended. This model which is quick, catchy and objective is used to conduct the nurses with specific clinical signs of oral evaluation (27).

Bleeding = Gums, mucosa, coagulation status

Redness = Gums, stomatitis, tongue

Ulceration = Size, shape, number, location, infected

Saliva = Consistency, hyper/hyposecretion

Halitosis = Character, acidotic, infected

External factors = ETT tapes/ribbon, braces, angular cheilitis

Debris: Plaque, thrush, foreign particles

Teeth: Decay, loose, broken swelling abscess are evaluated (27).

The best evaluation of oral situation requires individual follow-up plan (26, 36). Oral evaluation should be done repetitiously when children are admitted to the hospital, and if necessary, during hospitalization (9, 37).

2 Oral hygiene /Oral care:

The requirements for oral care are listed as below (27, 38):

To Provide and maintain oral hygiene

To prevent infection/stomatitis

To moisten oral mucosa

To support patient comfort

Oral hygiene interventions vary among the nurses (26-27, 39). Brushing with fluoride toothpaste is to be recommended to almost all of the patients apart from patients having serious ulcerations and coagulation disorders since it leads to gingival hemorrhage in their cases (40, 41).

Even edentulous and intubated patients need to have their teeth and gums brushed in order to have healthy mucosa (27, 38). The size of toothbrush does not affect its ability to remove the dental plaque, however toothbrush made of small size are preferred as it is easy to use for intubated patients (27). Even though toothbrush is proven to be effective in clinical trials, most of nurses prefer foam swab (8, 32, 34). Nevertheless foam swabs should be only use so as to moisten oral cavity. If brushing the teeth is impossible, it is indicated that effective on decreasing accumulation of dental plaque moisten foam swabs with CHG (27, 30, 37-38, 42-43). Usage of CHG helps to remove the dental plaque mechanically. CHG is an important part of comprehensive oral care. However it is underlined that it should not replace brushing (8, 35, 42-45).

3 Oral Care Frequency:

Oral care frequency is a matter of the debate in intubated patients. Oral care frequency should be adjusted in accordance with risk factors and individual needs. Brushing teeth once in twelve hours and moistening oral cavity once in two hours are recommended (27, 35, 44).

The protocols in previous studies:

According to Fitch et al. (46);

Pediatric and soft toothbrush should be used not to disturb oral tubes.

Antibacterial oral care products should be selected.

To keep the tissues moisten, mucous membrane should be coated with moisturiser gel -Oral Balance (R)- and lips with vaseline.

According to American Association of Critical-Care Nurses AACN (47) in comprehensive oral care;

- Oral mucosa and lips should be moistened in every 2-4 hours.

- 0.12% CHX should be used twice in a day.

According to Ames et al. (48);

If the patient is edentulous, his/her gums and teeth should be brushed gently.

If the patient is unconscious and has bruxism, mouth openers should be use.

Toothpaste should be removed by oral care mouth rinse using, irrigation syringe, foam and if necessary suction.

Conclusion

The previous researches have showed that lack of consideration of oral care in PICU might cause several complications. That is why giving due importance to comprehensive is both associated with nurse training and publishing protocols. Oral evaluation should be done so that individual needs of patients can be identified. Besides all these a standard protocol should be constituted. Foam swabs using for moisten mucosa is not able to replace toothbrush in terms of mechanical interventions. CHX is effective to decrease VAP. Most of the studies are about adult ICU. Standardized oral hygiene practice has the potential to contribute to improved oral and general health of infants and children in the pediatric critical. More comprehensive research in the PICU is needed for evaluation of the situation in our country.

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