

PENCEGAHAN MUCOSITIS DENGAN TERAPI MADU: INOVASI PERAWATAN MULUT PADA ANAK YANG MENJALANI KEMOTERAPI DI INDONESIA

Preventing Mucositis with Honey Therapy: Innovation Oral Care among children undergoing chemotherapy in Indonesia

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Abstrak

Pendahuluan: Mucositis oral merupakan efek samping kemoterapi yang sering terjadi dan menimbulkan rasa tidak nyaman, nyeri dan kurangnya asupan nutrisi. Pencegahan dan pengobatan mukositis oral sangat penting dengan menyikat gigi dan berkumur. Salah satu bahan yang dapat digunakan untuk berkumur adalah madu. **Tujuan:** untuk mengetahui pengaruh perawatan mulut dengan madu terhadap mukositis oral pada anak dengan kemoterapi. **Metode:** merupakan penelitian kuantitatif dengan desain quasi-experimental design pre and post test one group, dilaksanakan pada bulan Januari-Februari 2022. Jumlah adalah 30. Kriteria inklusi adalah anak usia 4-18 tahun, baik kondisi umum dan menerima kemoterapi mukotoksik tinggi. Anak-anak melakukan perawatan mulut selama 4 hari, menyikat gigi dua kali sehari dan berkumur dengan madu tiga kali sehari. **Hasil:** Terjadi penurunan skor mukositis oral sebelum dan sesudah intervensi pada domain nyeri ($0,30 \pm 0,47$ menjadi $0,20 \pm 0,74$), fungsi ($0,63 \pm 1,22$ menjadi $0,13 \pm 0,35$), dan penampilan ($0,20 \pm 0,41$ hingga $0,07 \pm 0,25$). Berdasarkan uji Paired Sample T-test terdapat perbedaan bermakna domain fungsi ($p < 0,05$) dan skor rata-rata mukositis oral ($t = 2,36$, $p < 0,05$). **Kesimpulan:** Perawatan mulut dengan madu efektif menurunkan mukositis oral pada anak menerima kemoterapi. Perawat dapat menerapkan perawatan mulut menggunakan madu secara teratur pada anak kanker yang sedang menjalani kemoterapi untuk meminimalkan mukositis oral.

Abstract

Introduction: Oral mucositis is a side effect of chemotherapy that often occurs and causes discomfort, pain and lack of nutritional intake. Prevention and treatment of oral mucositis is very important by brushing teeth and gargling. One of the ingredients that can be used for gargling is honey. **Purpose:** This study aims to identify the effect of oral care with honey on oral mucositis among children with chemotherapy. **Methods:** This study is quantitative research with a quasi-experimental design pre and post-test one group, conducted in January-February 2022. Total sample agreed to participate in this study is 30. Inclusion criteria are children aged 4-18 years, good general condition and received high mucotoxic chemotherapy. Children performed oral care for 4 days, brush teeth twice a day and gargle with honey three times a day. **Results:** There was a decrease in oral mucositis scores before and after intervention in pain domain (0.30 ± 0.47 to 0.20 ± 0.74), function (0.63 ± 1.22 to 0.13 ± 0.35), and appearance (0.20 ± 0.41 to 0.07 ± 0.25). Based on Paired Sample T-test, there was a significant difference in function domain ($p < 0.05$) and average score of oral mucositis ($t = 2.36$, $p < 0.05$). **Conclusion:** Oral care using honey is effective to reduce oral mucositis among children receiving chemotherapy. Nurses can apply oral care using honey regularly in cancer children who are receiving chemotherapy to minimize oral mucositis.

INTRODUCTION

Cancer in children is still a big problem and the leading cause of death in children and adolescents (WHO, 2021). The incidence of cancer in children is still high. Approximately 400,000 children and adolescents are diagnosed with different types of cancer each year (WHO, 2021). By 2021, it is estimated that 10,500 children in the United States, will be diagnosed with cancer and 1,190 will die from this disease (National Cancer Institute, 2021a). In Indonesia itself, in 2018 the prevalence of cancer is 30/1000 among children < 1 year, 310 aged 5-14 years, respectively (Kemenkes RI, 2018).

Oral mucositis occurs in 20-40% of patients receiving single-dose cytotoxic chemotherapy but in high-dose, increased by about 40% -76% with additional symptoms such as difficulty swallowing. (Hurrell et al., 2019; Miranda-Silva et al., 2021). A total of 42.5% of children in Australia had oral mucositis and in Brazil, 63.57% (Allen et al., 2018; Curra et al., 2021). The incidence rate in Indonesia is higher up to 88.3% of children who experienced oral mucositis (Hendrawati et al., 2019).

Educate patients and families related to oral care essentials but there is no standard specification for children undergoing chemotherapy (Miranda-Silva et al., 2021). It must be given to children and parents from the start of hospitalization (Kostak et al., 2020). Comprehensive oral care includes regular evaluation of oral conditions, educating patients and/or parents about brushing teeth, flossing, and gargling (Hasibuan et al., 2019). Effective oral hygiene will prevent infection and decrease damage to oral tissues (Hendrawati et al., 2019). There was a statistically significant relationship between oral care practices and the incidence of mucositis (Devi & Allenidekania, 2019). A total of 30 children aged 8-18 years who received education about oral care showed a lower degree of mucositis (Kostak et al., 2020).

Oral mucositis is treated with chlorhexidine in common but the side effect is burning sensations in the oral cavity (Miranda-Silva et al., 2021). An alternative agent that can be used is honey because a high-quality product with rich nutritional ingredients, easy to use, and cost-effective for the treatment of chemotherapy (Singh et al., 2018).

Research showed among 40 children with oral mucositis, experienced a significant decrease in body weight, duration of hospitalization and severity of pain (Al Jaouni et al., 2017; Sulistyawati & Putri, 2021). Several studies in systematic review and meta analysis resulted that application of honey had effect on therapeutic and reducing mucositis period (Yang, C., Gong, G., Jin, E., Han, X., Zhuo, Y., Yang, S., ... & Piao, C. (2019). However, research on the prevention of

mucositis among children undergoing chemotherapy.

METHODS

This study is a quasi-experimental design with one group. A total of 30 respondents agreed to participate in this study during January-February 2021. Inclusion criteria are children 4-18 years old, general condition who stable and received high-dose mycotoxin agent. This study was conducted in one of the biggest referral hospitals in Indonesia. The research instrument consisted of demographic data and a questionnaire with a total of 6 questions with a Likert scale. The instrument used in this study is the *Children's International Mucositis Evaluation Scale* (ChIMES) and *World Health Organization's Mucositis Index* developed by Qutob, A. F., Allen, G., Gue, S., Revesz, T., Logan, R. M., & Keefe, D (2013). Adaptation and translation to Bahasa are conducted with the acceptable result of Content Validity Index (CVI) with 0,94. There are three domain variables consist of pain, function, and appearance. The original instrument had good reliability with Cronbach's alpha > 0.826. Data analyzed used SPSS Version 23 univariate and bivariate (*Paired T-Test* and *ANCOVA*). Normality test with Shapiro-Wilk described that data was normally distributed with p-value >0.005

The researcher observed the oral mucositis score and treatment conducted on four consecutive days in three consecutive days. The process of the study measured pre-test scores then respondents were then given oral care treatment by brushing their teeth 2 times per day, gargling with 15ml of honey solution 3 times per day. The honey used in this study is standardized to meet the Indonesian National Standard (SNI) and has been tested for quality in the laboratory of the Central Agro-Industry Center (BBIA) of the Ministry of Industry of the Republic of Indonesia. The honey ingredients are enzyme diastase 8 DN, 20% water, 1.46% sucrose, and 30 ml NaOH/kg acidity. This formula is antioxidants that increase endurance, a source of energy, and natural antibiotics and will heal skin wounds and has a naturally sweet taste.

RESULTS

Based on table 1 the age distribution is quite similar between preschool, school, and adolescent with 36.7%; 33.3%, and 30.0%, respectively. The most common type of cancer is non-hematological cancer (73.3%) and the type of high-mycotoxin chemotherapy agent was the combination (56.7%). Most of the children in this study had adequate nutritional status (80%) and 76.7% of respondents had a history of oral mucositis. From Table 4.2, there is a statistically significant difference between pre-test and post-

Table 1. Demographic characteristics among children undergoing chemotherapy with oral mucositis (n=30)

Variables	f	%
Age (year) Mean±SD (9.9±4.5)		
Preschool children (4-6)	11	36.7
School children (7-12)	10	33.3
Adolescent (13-18)	9	30.0
Sex		
Boy	15	50
Girls	15	50
Cancer type		
Hematology	8	26.7
Non-hematology	22	73.3
Type of agent chemotherapy		
Single	13	43.3
Mixed	17	56.7
Nutrition status		
Undernutrition (< -2SD)	5	16.7
Good (≤ - 2SD – 2SD)	24	80.0
Overweight (> 2SD)	1	3.30
Mucositis history		
Yes	23	76.7
No	7	23.3

Table 2. The effect of oral care with honey care for mucositis children

Domain Mean (±SD)	t (95% CI)	Pre- test	Post- test	p- value
Total score		1.13 (1.91)	0.40 (0.77)	0.025
Pain	2.36 (0.16)	0.30 (0.47)	0.20(0. 74)	0.33
Function	0- 1.37)	0.63(1. 22)	0.13(0. 35)	0.01
Appearance		0.20(0. 41)	0.07(0. 25)	0.16

DISCUSSION

Oral mucositis is a disorder that causes erythema and ulcerative lesions, which are common in pediatric oncology patients receiving chemotherapy (Kostak et al., 2020). The risk factor for oral mucositis is younger age. In children, epithelial cell mitosis is faster and mucous membranes are more sensitive to toxicity (Hasibuan et al., 2019; Hendrawati et al., 2019). Most of the children in this study suffer from non-hematological cancers including osteosarcoma and retinoblastoma, hepatoblastoma, lymphoma, rhabdomyosarcoma, and neuroblastoma. This result is different from other research by Rokhaidah & Herlina (2018) that the most common type of cancer in children was acute lymphoblastic leukemia (94.1%).

increase the risk of infection (Hasibuan et al., 2019).

Chemotherapy agents obtained in the previous cycle had an effect on the mucous membranes, resulting in oral mucositis. These chemotherapeutic agents are secreted into saliva, thereby directly increasing the risk of oral mucositis (Hasibuan et al., 2019). The healing process of oral mucositis may take longer if the patient is accompanied by an infection (National Cancer Institute, 2021b).

The results of this study are in line with the other researchers (Sulistyawati & Putri, 2021; Rokhaidah & Herlina, 2018). Doing oral care regularly can maintain hygiene and moisture. In addition, lean plaque, maintain mucosal integrity, prevent infection, prevent chapped and injured lips, and maintain good oral function that contributes to local infection and mucositis (Devi & Allenidekania, 2019; Hendrawati et al., 2019). The use of honey in oral care has an influence on the prevention and treatment of oral mucositis during cancer treatment. Honey contains the enzyme catalase which can produce hydrogen peroxide which is the main component of antimicrobials. Diluted honey activates the enzyme glucose oxidase which catalyzes glucose to form gluconic acid and hydrogen peroxide (Bittmann et al., 2010).

Honey had a pH ranging from 3.2- 4.5, to inhibit the growth of pathogens. The high sugar content of honey draws water from the wound, reducing the availability of water for pathogens, which further inhibits microbial growth. In addition, honey contains the enzyme glucose-oxidase which stimulates the release of hydrogen peroxide upon contact with body tissues, which has an antiseptic effect. This can help phase 4 (ulceration and inflammation) of the biological process of mucositis and minimize more severe mucositis and colonization by oral bacteria and the risk of sepsis (Sulistyawati & Putri, 2021).

The results of a previous study stated that 62% of children recovered within 4 days and healed within 8 days (Singh et al., 2018). Other studies have also shown that oral treatment with honey can reduce the degree of oral mucositis and the duration of hospitalization. There was a significant difference in the duration of hospitalization for oral mucositis patients.

CONCLUSIONS

Based on the analysis results there is a difference in oral mucositis scores of respondents before chemotherapy and after oral care intervention using honey. Oral care using honey is effective in reducing the degree of oral mucositis in children receiving chemotherapy. Nurses can develop standardized oral care

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