Effectiveness of Oral Care Using Normal Saline and Baking Soda Towards Pain and Comfort in Mucositis Patients Undergoing Chemotherapy

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Abstract

Objects: to identify the effectiveness of oral care using normal saline and baking soda towards pain and comfort in mucositis patients undergoing chemotherapy.

Methods: this is a quai-experiment pre-posttest with a control group design. The sampling technique was used for consecutive sampling. The sample was 40 divided into two groups.

Results: the results of this study used the Paired t-test in the intervention group before and after treatment showed a significant difference in pain intensity (t=14,257, p=0,000) and comfort (t=-11,103, p=0,000). In the control group there were also significant differences in pain intensity (t = 10,341, p=0,000) and comfort (t=-6,842, p=0,000). Based on the Independent t-test, there was a significant difference in pain (t=-3.287, p=0.002) and comfort (t=4.001, p=0.000) after gargling using normal saline and baking soda.

Conclusion: the results of this study indicate that gargling using a solution of normal saline and baking soda sodium bicarbonate is effective in reducing mucositis pain and improving the comfort of patients undergoing chemotherapy.

Keywords: *Mucositis; Normal saline; Baking soda; Pain; Comfort*

Introduction

The Ministry of Health of the Republic of Indonesia said that cancer as the cause of death ranks seventh (5.7% of all causes of death) after death from stroke, tuberculosis, hypertension, injury, perinatal, and diabetes mellitus. Based on the prevalence of cancer in the population category of all ages in Indonesia in 2013 was 1.4 ‰ population or around 347,792 patients with Yogyakarta Province which ranks highest for cancer in the amount of 4.1 ‰ or around 68,638 patients[(1)].

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Chemotherapy is a cancer therapy that involves the use of chemicals or drugs whose purpose is to kill cancer cells. Chemotherapy treatment can reach cancer cells that have spread to parts of the patient's body. The side effects of chemotherapy vary depending on the modification of the chemotherapy drug given[(2)]. Based on the National Cancer Institute that side effects that can occur due to chemotherapy are nausea, vomiting, diarrhea, stomatitis/mucositis, alopecia, susceptible to infection, thrombocytopenia, neuropathy, and neuropathy, and that is nausea, vomiting, diarrhea, stomatitis/mucositis, alopecia, susceptible to infection, thrombocytopenia, neuropathy, and neuropathy malygia[(3)].

In the condition of pain and discomfort experienced by mucositis patients, the action taken is to perform oral care. Oral care is an action taken to clean the mouth, brush teeth and gargle to prevent odors and caries, maintain the integrity and hydration of the oral mucosa

and lips, maintaining oral mucosa, increasing self-esteem and comfort[4]. One of the treatments for oral care uses normal saline and baking soda. Salazar et al. said that Normal saline is the recommended way to take oral care. Gargling with the frequency that often can moisturize the mouth and prevent crusting and soothing gums and mouth mucosa[5]. Whereas Ignatavicius and Workman said that cancer patients who had mucositis received oral treatment with warm water, normal saline, and baking soda given in 4 times a day and performed according to the condition of the oral cavity[6].

Methods

The study was used a quasi-experimental design with a pretest-posttest with a control group. This study was conducted at two public hospitals in Medan. The respondents were 40 using consecutive sampling, divided 2 groups with inclusion criteria: 1) respondents with medical diagnoses of cancer with mucositis as a result of chemotherapy in the inpatient hospital in Medan, 2) experiencing pain in the mouth, 3) aged over 17-65 years, 4) willing to follow the treatment until the end of the study. Exclusion criteria: 1) respondents with unilateral reasons to stop participating in the study and 2) not continuing chemotherapy.

The procedure was carried out following the SOPs that the researchers attached such as the oral care SOP in the hospital, only the researchers added the materials according to the researcher's intervention. Oral care was done 4 sessions in 1 day at 07.00a.m, 13.00p.m, 19.00p.m, and 10.00p.m. Respondents will rinse their mouth for 30 seconds. After the researchers gave the mouth rinse treatment using normal saline and baking soda to respondents for 5 days then the researcher reassessed (post-intervention) pain and comfort level. Pain measurement was performed using the Numeric Rating Scale (NRS) with the category of no pain (0), mild pain (1-3), moderate pain (4-6), controlled severe pain (7-9), severe pain uncontrolled (10) while the measurement of comfort was done using the Daily Comfort Scale (DCS) with very bad categories (score

1), slightly bad (score 2), slightly good (score 3), very good (score 4). Data were analyzed through paired t-test and independent t-test because of the data normally distributed.

Results

Table1. Frequency distribution of characteristics of cancer patients suffering from mucositis undergoing chemotherapy

Variable	Intervention group		Control group	
	N	%	n	%
Ages				
17-25 years	1	5	1	5
26-35 years	7	35	4	20
36-45 years	4	20	6	30
46-55 years	8	40	8	40
56-65 years	20	100	1	5
Total			20	100
Mean±SD	51,45±8,918		42,55±9,822	
Min–Max	34-65		17-60	
Gender				
Male	11	55	12	60
Female	9	45	8	40
Cancer type				
NPC	9	45	10	50
Breast	5	25	2	10
Larynx	1	5	2	10
Tongue	4	20	1	5
Tonsils	1	5	1	5
Ovary			3	15
NHL			1	5
Rhobdo Neo Carcinoma				
Long suffered from the disease				
Acute (<6 months)	7	35	8	40
Chronic (>6 months)	13	65	12	60
Length chemotherapy				
<6 months	14	70	14	70
6 months-1 year	4	20	4	25
>1 years	2	10	2	12,5
Mucositis degree				
Degree 1	3	15	6	30
Degree 2	3	15	6	30
Degree 3	6	30	5	25
Degree 4	8	40	3	15

Table 1. shows that characteristics of cancer respondents undergoing chemotherapy based on age in the intervention group majority were late elderly respondents (56-65 years), while for the control group majority were initial elderly respondents (46-55 years). Based on the gender intervention and group the majority was male. Based on the type of cancer in the intervention and control group majority was NPC. Based on the length of time suffering from cancer showed that in the intervention and control group majority were more 6 months (chronic). Based on the length of chemotherapy intervention and control group majority had less than 6 months. Based on the degree of mucositis due to the effects of chemotherapy showed that in the intervention group was degree 4 mucositis (40%), whereas the control group was 1 and 2 degree (30%).

Table 2. frequency distribution of pain with mucositis patients

Mucositis pain	Intervention group				Control group			
	Before		After		Before		After	
	n	%	n	%	n	%	n	%
Scale 1-3 Scale 4-6 Scale 7-9 Total	8 12 20	40 60 100	12 8 20	60 40 100	9 11 20	45 55 100	3 17 20	15 85 100
Mean ± SD Min – Max	6,60±1,09 4-8		3,45±0,99 2-5		6,60±0,75 5-8		4,40±0,82 3-6	

Table 2. shows that the distribution of pain intensity of respondents who experienced mucositis before being given mouthwash treatment of normal saline and baking soda in the intervention group was severe pain (60%), after being given treatment for 5 days was mild pain (60%). Whereas the control group obtained who experienced mucositis before was severe pain scale (55%), after 5 days was moderate pain (85%).

Table 3. frequency distribution of comfort of patients with mucositis

Mucositis comfort	Intervention group				Control group			
	Before		After		Before		After	
	n	%	n	%	n	%	n	%
Score 1 Score 2 Score 3 Score 4 Total	7 11 2 20	35 55 10 100	1 6 13 20	5 30 65 100	5 14 1 20	25 70 5 100	5 13 2 20	25 65 10 100
Mean ± SD Min – Max	1,75±0,63 1-3		3,60±0,59 2-4		1,80±0,52 1-3		2,85±0,58 2-4	

Table 3. shows that the distribution of comfort of respondents who experienced mucositis before being given mouthwash treatment of normal saline and baking soda in the intervention group was a little bad comfort (score 2) (55%), after being given treatment for 5 days was very good comport (score 4) (65%). Whereas the control group obtained who experienced mucositis before was a little bad comfort (score 2) (70%), after 5 days was slightly good comfort (score 3) (65%).

Table 4. comparison of pain and comfort before and after oral care

Variable	Intervention group			Control group		
	Mean Differences	t	Sig	Mean Differences	t	Sig
Pain Comport	3,150 -1,850	14,257 -11,103	0,000 0,000	2,200 -1,050	10,341 -6,842	0,000 0,000

Table 4. shows that there was a significant comparison between pain (t=14,257, p=0,000) and comfort (t=-11,103, p=0,000) in the intervention group before and after oral treatment using normal saline and baking soda. Whereas in the control group there was a significant difference between pain (t=10,341, p=0,000) and comfort (t=-6,842, p=0,000).

Table 5. the difference in pain and comfort of patients with mucositis after oral care

Variable	Mean Differences	t	Sig
Pain Comport	-0,950 0,750	-3,287 4,001	0,002 0,000

Table 5. shows that there was a significant difference in pain (t=-3.287, p=0.002) and comfort (t=4.001, p=0.000) after the mouth rinse was performed using normal saline and baking soda.

Discussions

This study indicated that the average age in the intervention group due to mucositis was 51.45 years where less than half were late elderly aged 56-65 years. While the average age in the control group was 42.55 years where less than half the number of respondents were early elderly with ages 46-55 years. In line with the study Panghal et al. that cancer cases experienced mucositis in group one 60 years, group two 45 years, and group three 50 years[7].

The results obtained in the intervention group who experienced mucositis more than half of the number of respondents male sex (55%) and the control group of male sex more than half of the number of respondents (60%). Accordance with Adha that pain responses based on sex differ between women and men, it occurs because men are more resistant to receiving the effects of pain while women often complain of pain and crying. Based on the type of cancer experienced by respondents, researchers found the results in the intervention group 31.30% had NPC cancer types and in the control group 45% had NPC cancer types and in the control group also found 50% had NPC cancer[8].

Panghal et al. said that the types of cancer that have mucositis are categorized as cancer of the tongue, oral, and oropharyngeal[7]. Meanwhile, according to Saldanha and Almeida that clinical consequences occur mucositis in head and neck carcinoma (HNC) patients that show the location of primary tumors including the oropharynx, larynx, oral cavity including the lips, hypopharynx, and

nasopharynx[9].

Based on the duration of undergoing chemotherapy in patients with mucositis, the study found that in the intervention group more than half of the respondents underwent chemotherapy for less than six months (70%), six months to one year (20%) and above one year as much (10%). In line with Meirovitz et al. that of the 15 respondents, 30% had mucositis up to grade fourth occurred in the fourth week after the patient took chemotherapy treatment[10].

Based on the results of research conducted by researchers on cancer patients who experienced mucositis due to side effects of chemotherapy that in intervention patients experiencing mucositis painless than half of the number of respondents (40%) experienced moderate pain (4-6 scale) and more than half of the number of respondents (60%) experienced severe controlled pain (7-9 scale) before being given treatment. Whereas in the control group the results were less than half of the number of respondents (45%) had moderate pain (4-6 scale) and more than half of the number of respondents (55%) had controlled severe pain (7-9 scale). Supported by Cakmak & Nesrin said that patients who experience mucositis experience pain (4.8%), difficulty speaking (4.8%), erythema (4.8%), burning sensation (4.1%), bleeding (1.4%), dry and chapped lips (41.5%), difficulty swallowing (11.6%)[11].

The results of researchers to respondents who experienced mucositis that in the intervention group more than a quarter of the total respondents experienced very bad comfort (score 1) (35%), more than half of the number of respondents (55%) experienced slightly poor comfort (score 2) and comfort is a slightly good (score 3) (10%). Whereas in the control group it was found that respondents felt comfortable that a quarter of the respondents (25%) felt very bad comfort (score 1), more than half of the number of respondents (70%) felt the comfort was a little bad (score 2) and the rest as many as (5%) felt slightly good comfort (score 3). According to Hack that ignoring comfort problems can affect a patient's psychological condition, even causing prolonged depression. Depression was found to be a significant factor that can cause despair in patients, apart from pain and lack of family support[12]. Supported by Nuraini et al. that patients feel discomfort because they feel pain, pain that is felt due to illness, the presence of lumps or painful swelling, a dosage of medication, and types of drugs given[13].

The results showed that there were significant differences in the intervention group namely pain (t =14,257, p=0,000) and comfort (t=-11, 103,p=0,000). While in the control group there were also significant differences between pain (t=10,341, p=0,000), comfort (t=-6,842, p=0,000). In line with the results of a study conducted by Sutomo in saltwater rinses on pain reduction in dental sufferers, it was found that respondents after saltwater rinse had decreased pain levels on an average scale of 2 (slight pain)[14]. According to Saldanha and Almeida explained that normal saline (0.9%) is not irritant and is believed to help the formation of granulation tissue and increase the healing of mucositis. Mouthwash that is safe, economical, and available. Saltwater mouthwash is considered an excellent treatment when we have mouth sores. The reason is that saltwater is not only a natural disinfectant but also removes swelling from the tissues. Giving mouthwash to patients with normal saline can prove to be very economical and beneficial for patients in terms of healing and alleviating symptoms and also in their future use and preventing complications[9].

The results showed that there was a significant difference between (t=-3.287, p=0.002) and comfort (t=4.001, p = 0.000) after oral treatment using normal saline and baking soda. According to Gandhi et al. that the main treatment for mucositis is palliative therapy, which includes oral hygiene at home, pain control through the use of topical analgesics or anesthetics, oral rinse without drugs, ie mouth rinses of 0.9% saline or sodium bicarbonate 4-6 times/day[15]. Furthermore according to McGuire et al. that normal saline is a harmless rinse that can help maintain oral hygiene and patient comfort and sodium bicarbonate is a harmless rinse that can help maintain oral hygiene and patient comfort. However, sodium bicarbonate may not be useful in children, who might find it unpleasant[16].

Conclusions and Recommendation

This study indicates that gargling using normal saline and baking soda is effective in reducing mucositis pain and improving the comfort of patients undergoing chemotherapy, in providing oral care. This study is expected to be a reference for future researchers

and it is advisable to look at the degree of mucositis, controlling it strictly as long as the intervention is given to respondents.

Conflict of Interest: Nil

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Ethical Consideration: This research has passed the test of ethics from the health research ethics committee of the Nursing Faculty of Universitas Sumatera Utara, with registration number 1704/III/SP/2019.

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