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Comparison of Supine position versus Semi-Fowler's position on Chemotherapy-induced nausea and vomiting among patients undergoing chemotherapy for Breast Cancer

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Abstract

Introduction: Cancer is a disease that affects people all over the world, and chemotherapy is the gold standard treatment for cancer. The most irritating and unpleasant side effect of chemotherapy is Chemotherapy-induced nausea and vomiting (CINV). **Objective:** The objective of the present study was to evaluate the effectiveness of the Supine position versus Semi-Fowler's position on Chemotherapy-induced nausea and vomiting among patients undergoing chemotherapy for Breast cancer in the Oncology wards of Medical College Hospital, Thiruvananthapuram. **Methodology:** A quantitative approach was adopted for this study and the research design was a quasi-experimental post-test-only control group design. The sample size was 60, and the samples were recruited consecutively. The study included adult individuals aged above 18 years undergoing chemotherapy and receiving the drug regimen – a combination of Injection Doxorubicin 50 mg/m² IV and Injection Cyclophosphamide 500 mg/m² IV for breast cancer. The participants in the control group were positioned in the supine position while receiving chemotherapy, and those in the experimental group were positioned in a semi-Fowler's position, that is, with the head and trunk raised to a 30-degree angle using a backrest while the patient was lying on his back, until the completion of the chemotherapy medication infusion. The effect of position on nausea and vomiting is assessed using the “Modified Rhodes Index of Nausea and Vomiting” for both control and experimental groups 24- and 48 hours after chemotherapy. **Result:** It was found that the total Chemotherapy-induced nausea and vomiting score among the control group was 36.37±17.2, and that of the experimental group was 18.47±15.02 after the intervention, and the observed difference is statistically significant (p<0.05). **Conclusion:** The result showed that the semi-Fowler's position is more effective in reducing Chemotherapy-induced nausea and vomiting among patients undergoing chemotherapy for breast cancer, and the nurses who work in the oncology department can incorporate this as a nursing intervention as it is cost-effective and require no additional cost.

Key words: Breast cancer, chemotherapy-induced nausea and vomiting, supine, and semi-Fowler's position

Introduction

Cancer is one of the most serious health problems in the world. One in four men and one in five women are expected to have cancer, and one in eight men and one

in eleven women are estimated to have died from it in 2020. In 2020, there were 10.3 million cancer deaths and 19.3 million new cases worldwide. Asia accounts for 50% of all cancer deaths and new cases worldwide (WHO, 2020).

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Breast cancer, which was discovered in 7.8 million women over the preceding five years, was the most prevalent cancer in the world as of 2020. Breast cancer claimed the lives of 6,85,000 persons globally in 2020, affecting 2.3 million women (WHO, 2020). Breast cancer is the most common malignancy in women in India, accounting for 14% of all female cancer cases.

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Early in the 1930s, India's incidence rates began to rise, peaking between the ages of 50 and 64. According to cancer statistics from India, 1 in 28 women would certainly develop breast cancer at some point in their lives. The treatment options for cancer include surgery, chemotherapy, radiation treatment, hormone therapy including immunotherapy such as monoclonal antibody therapy and synthetic lethality surgery, chemotherapy, radiation therapy, hormone therapy, targeted therapy (including immunotherapy, such as monoclonal antibody therapy), and synthetic lethality. The type of therapy depends on the patient's overall health as well as the location, severity, and stage of the disease (cancerindia.org.in).

Chemotherapy is the use of anticancer drugs to stop the growth and reproduction of tumor cells. The most common and dreaded side effect of many cancer treatments for cancer patients and their significant others is chemotherapy-induced nausea and vomiting (CINV). Twenty percent of patients receiving strongly emetic medications delayed or even refused potentially curative therapies (chemotherapy-induced nausea and vomiting(wikipedia.org)).

Vomiting and nausea are thought to be frequent and upsetting side effects of cancer treatment. Uncontrolled nausea and vomiting can result in major side effects, including electrolyte imbalances, anorexia, weight loss, dehydration, and a decline in the patient's general health. The severity of nausea and vomiting may cause chemotherapy doses to be reduced. Uncontrolled vomiting can cause patients to refuse or discontinue treatment, a sign that nausea and vomiting are ongoing problems for cancer patients undergoing treatment (Ahmed M. et al., 2016). CINV can complicate treatments, create severe mental and physical pain, interfere with daily activities, and affect a patient's quality of life (www.rch.org.au/rhcpg/hospital).

Despite the fact that 38.5% of the 200 patients received highly emetogenic chemotherapy and 46.5% received moderately emetogenic chemotherapy, the incidence of acute and delayed nausea after chemotherapy treatment was 54% and 15.5%, and the incidence of acute and

delayed vomiting was 36.5% and 14.5%, respectively (Baburaj G et al., 2017).

Traditional pharmacological regimens may not entirely cure nausea and vomiting from chemotherapy in oncology patients, despite advancements in pharmacological management. To counteract nausea and vomiting brought on by chemotherapy, a variety of nonpharmacological treatments are currently used in addition to pharmaceutical treatments. Maintaining the patient in a semi-Fowler's position is one method for reducing the intensity, duration, and frequency of nausea as well as the intensity and frequency of vomiting. It can be included in routine nursing interventions without taking up any more time or resources (Fathi et al., 2014).

Oncology nurses can make a significant difference in reducing the burden of this terrible side effect of chemotherapy. The best antiemetic medication can be administered if patients are assessed more accurately before and during chemotherapy. Adherence can be increased with better patient communication. Oncology nurses should begin the procedure in settings or locations where guidelines for chemotherapy-induced nausea and vomiting have not yet been established. A critical step in lowering the burden of chemotherapy-related nausea and vomiting is improving the education of oncology nurses, especially those who are new to the field.

From the researcher's professional expertise, she could appreciate that nausea and vomiting are the most dreadful and crippling side effects of chemotherapy for a patient. Vomiting and nausea brought on by chemotherapy severely affect a patient's quality of life. The management of chemotherapy-induced nausea and vomiting (CINV) is currently unsatisfactory, although numerous antiemetic therapies have been demonstrated to be successful in lowering CINV. Placing the patient in a semi-Fowler's position is a nonpharmacological intervention that requires no active participation from the chemotherapy patient. Therefore, the investigator aimed to compare how well the semi-Fowler's and supine positions affected

chemotherapy-induced nausea and vomiting in breast cancer patients.

Methods

A quantitative research approach was adopted for the study, and the design was a quasi-experimental non-equivalent control group posttest-only design. The sample size was determined to be 60 when the power was set at 0.80 and the alpha value at 0.05, i.e., 30 participants in the control group and 30 in the experimental group. The study participants were recruited consecutively and met the inclusion and exclusion criteria. The study included adult individuals aged above 18 years undergoing chemotherapy and receiving the drug regimen – a combination of Injection Doxorubicin 50 mg/m² IV and Injection Cyclophosphamide 500 mg/m² IV for breast cancer in the Oncology wards of Medical College Hospital, Thiruvananthapuram. Patients who were unable to remain in the supine and semi-Fowler’s position, pregnant women, known cases of gastroesophageal reflux disease, and patients who had cognitive and psychiatric disorders and anticipatory Modified Rhodes Index of Nausea and Vomiting scores of more than 12 were excluded from the study. After receiving the patients’ written informed consent, the researcher used a semi-structured interview schedule to collect sociodemographic and clinical data from the patients.

The Modified Rhodes Index of Nausea and Vomiting is a self-reported tool that was used to evaluate both the objective and subjective aspects of nausea and vomiting. In this tool, CINV has been divided into four categories: anticipatory, acute, delayed, and three days total CINV. Anticipatory CINV is defined as nausea and/or vomiting that occurs prior to chemotherapy, acute CINV is defined as nausea and/or vomiting that occurs within 24 hours of chemotherapy, and delayed CINV is defined as nausea or vomiting that occurs within 48 hours of chemotherapy. The instrument includes eight CINV-related questions, with a score of 60, and 84 for nausea and vomiting respectively, and a total CINV score of 144, the highest possible (Ahmed, M., & Alfafsheh, A., 2016).

The patients in the control group were positioned in the supine position while on chemotherapy, and those in the experimental group were positioned in a semi-Fowler’s position, that was, the head and trunk at a 30-degree angle using a backrest, while the patient in the control group was lying on his back until the completion of the medication. Nausea and vomiting were assessed using “The Modified Rhodes Index of Nausea and Vomiting” in both groups after 24 and 48 hours. Participants were provided with a diary to note the severity and frequency of nausea and vomiting and were interviewed after 48 hours. To prevent contamination, the control group patients were taken during the first half. Before the study was carried out, formal approval from the institutional ethical committee was acquired.

SPSS version 17 was used to examine the descriptive and inferential statistics data.

Table 1 Baseline Characteristics of Participants

	n=60	
Sample Characteristic	Control group (30)	Experimental group (30)
Age		
≤45	10 (33.3%)	7 (23.3%)
46–55	12 (40%)	16 (53.4%)
>55	8 (26.7%)	7 (23.3%)
Gender		
Female	29 (96.7%)	30 (100%)
Male	1 (3.3%)	0 (0%)
Diet pattern		
Vegetarian	0 (0%)	1 (3.3%)
Nonvegetarian	30 (100%)	29 (96.7%)
Family history of cancer		
Absent	25 (83.3)	22 (73.3%)
Present	5 (16.7%)	8 (26.7%)

Stage of cancer			Antiemetics used		
Stage I	9 (30%)	6 (20%)	5-HT3 antagonist		
Stage II	16 (53.3%)	17 (56.7%)	+Dexamethasone	30 (100%)	30 (100%)
Stage III	5 (16.7%)	6 (20%)			
Stage IV	0 (0%)	1 (3.3%)	Time of food intake before chemotherapy		
Current chemotherapy cycle			<=20 minutes	4 (13.3%)	6 (20%)
1	14 (46.7%)	13 (43.3%)	20-40 minutes	0 (0%)	2 (6.7%)
2	7 (23.3%)	8 (26.7%)	1-60 minutes	0 (0%)	1 (3.3%)
3	3 (10%)	5 (16.7%)	>1 hour	26 (86.7%)	21 (70%)
4	6 (20%)	4 (13.3%)			

Table 2 Comparison of total nausea scores between the control and experimental groups

(n=60)

Nausea score	Control group (n=30)		Experimental group (n=30)		Independent t test	
	Mean	SD	Mean	SD	t	p-Value
Anticipatory	1.17	2.21	0.6	1.61	1.13	0.262
Acute	7.23	3.56	3.47	2.88	4.51	<0.001
Delayed	10.1	4.46	5.43	4.65	3.97	<0.001
Total score	18.5	8.03	9.5	7.69	4.44	<0.001

Table 2 shows that the total nausea score among the control group was M=18.5, SD=8.03 and that of the experimental group was M=9.5, SD=7.67, and the observed difference was statistically significant (p<0.001). We concluded that semi-Fowler's position is more effective in reducing chemotherapy-induced nausea among patients undergoing chemotherapy for breast cancer.

Table 3 Comparison of Total Vomiting Score between the control and experimental group

N=60

Vomiting score	Control group (n=30)		Experimental group (n=30)		Independent t test	
	Mean	SD	Mean	SD	t	p-Value
Anticipatory	1.03	2.08	0.53	1.38	1.10	0.277
Acute	6.93	4.61	2.97	2.53	4.13	<0.001
Delayed	9.7	4.89	5.17	4.98	3.56	0.001
Total score	17.67	9.02	9	7.43	4.07	<0.001

Table 3 signifies that the total vomiting score among the control group was 17.67±.02 and that of the experimental group was 9±7.43 after the intervention. The observed difference was statistically significant (p<0.001), and it was concluded that the semi-Fowler's position is more effective in reducing chemotherapy-induced vomiting among patients undergoing chemotherapy for breast cancer.

Table 4 Comparison of the total CINV score between the control and experimental groups

N=60

CINV score	Control group (n=30)		The experimental group (n=30)		Independent test-test	
	Mean	SD	Mean	SD	t	p
Anticipatory	2.2	4.26	1.13	2.99	1.12	0.266
Acute	14.17	8.07	6.4	5.33	4.4	<0.001
Delayed	19.9	9.32	10.93	9.67	3.66	0.001
Total score	36.37	17.2	18.47	15.02	4.30	<0.001

Table 4 signifies that the total CINV score among the control group was 36.37 ± 17.2 and that of the experimental group was 18.47 ± 15.02 . After the intervention, the observed difference was statistically significant ($p < 0.001$), and it was concluded that semi-Fowler's position is more effective in reducing CINV among patients undergoing chemotherapy for breast cancer.

Discussion

An important nonpharmacological intervention for the management of chemotherapy-induced nausea and vomiting is patient positioning. The results showed that the Semi-Fowler's position effectively reduces CINV among patients undergoing chemotherapy for breast carcinoma.

The frequency and severity of nausea and vomiting were decreased in patients who were in a semi-sitting position while receiving chemotherapy, according to a randomized clinical trial on 60 breast cancer patients, which examined the impact of this position on the side effects of chemotherapy in women with breast cancer (Razooli A., 2012).

The present study findings are supported by another study conducted to assess the effect of the semi-upright position on the incidence and intensity of CINV, which showed that all characteristics of nausea and vomiting in the semi-upright position were significantly lower than those attributed to the horizontal position ($p < 0.05$) (Firouzkahi MR., 1999).

Limitations of the study

The study was limited to 60 participants and to the oncology wards of the Medical College Hospital, Thiruvananthapuram.

Conclusion

This study concluded that the semi-Fowler's position significantly reduces chemotherapy-induced nausea and vomiting among patients receiving chemotherapy for breast carcinoma. This study suggests the need for similar nonpharmacological studies to reduce the severity of nausea and vomiting during chemotherapy. This study sheds light on the importance of training nurses in nonpharmacological, physical, and other supportive therapies that can be added to routine practice without much cost and time, which improves the comfort of patients undergoing chemotherapy.

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