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Evaluating the current practice in the preventing of nausea and vomiting in hospitalized patients with cancer in Najaf province

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ABSTRACT

Cancer is a group of diseases that cause by genetic or epigenetic alterations in the somatic cells and characterized by uncontrolled cellular growth which may be spread to other organ. Chemotherapy, surgery and radiotherapy that use in treatment of cancer are known risk factors for Nausea and vomiting and higher incidence in patient received chemotherapy and evidence indicates that the absolute danger depends on emetogenicity of chemotherapy, so highly emetogenic drugs have higher incidence for nausea and vomiting .Many types of antiemetic agents with different mechanisms of action have been developed for chemotherapy induce nausea and vomiting. The most commonly used antiemetic agents are 5-HT3 antagonists, corticosteroids, and NK1 receptor antagonists and the aim of this study to evaluate the current practice in the preventing of nausea and vomiting in hospitalized patients with cancer and this study is a cross-sectional study, it involved 100 patients and conducted at National Teaching Hospital for Oncology in Najaf province. The monitoring was conducted during the period from September 15 to November 15 and this study included 100 participants, including male gender (45%) and female gender (55%) with variation in age 24-34y (%5) ,35-45y (12%), 46-56y (38%), 57-67y(37%) ,68-80y (8%),The duration of antiemetic for 2days (8%) and for 3days (%92) , and many causes of admission such as for receive chemotherapy (26%), nausea ,vomiting and diarrhea(%14) .

Keywords: Cancer, Chemotherapy, Nausea and vomiting, Antiemetics

I. INTRODUCTION

Cancer is a group of diseases that cause by genetic or epigenetic alterations in the somatic cells and characterized by uncontrolled cellular growth which may be spread to other organ. They form a subset of tumor. The uncontrolled growth of cells in a group called neoplasm or malignancy and they form mass and may be distributed diffusely.[1] The pathophysiology of cancer involves several stages.The first stage: is initiation, occur when a carcinogenic substance experience mutation in a cell's DNA, leading to the activation of oncogenes or the inactivation of tumor suppressor genes and result in a mutated cells .The second stage : is promotion, that consider reversible processes where the mutated cells are stimulated to divide and grow rapidly over normal cells forming a small cluster of abnormal cells.The third stage: is progression, occur when abnormal cells continue to divide and grow, forming a neoplasm that can invade

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surrounding tissues and spreads or metastases to other organs of the body through the hematogenous or lymphatic system.[2]

The management of cancer depends on many factors that include the type, stage of the cancer, the patient's overall health, and the patient's preferences. Surgery is a common treatment for different types of cancer. During the surgery, the surgeon takes out the mass of cancerous cells (tumor) and some of the nearby tissue. Sometimes, surgery is performed to relieve side effects caused by a neoplasm.[3] Chemotherapy describe medications used to kill malignant cells. The medications may be given orally or parenterally. Different types of drugs may be given as combination chemotherapy at the same time or one after the other.[4] Chemotherapy-induced nausea and vomiting is a common treatment-related side effect that has an effect on the standard of health of patients with cancer and may lead to decrease dose of chemotherapy or discontinuation of its. The development of new antiemetic agents has dramatically changed the landscape of chemotherapy-induced nauseas and vomiting.[5] Emetogenicity of chemotherapy divided into the following 4 categories:

Highly emetogenic drugs: medications that cause CINV in more than 90% of patients. Moderately emetogenic drugs: medications that cause CINV in 30% to 90% of patients. Low emetogenic drugs: medications that cause CINV in rates of 10% to 30%. Minimally emetogenic drugs: medications that cause CINV in less than 10% of patients.[6] Different types of antiemetic agents with different mechanisms of action have been developed for CINV, many of them in most cases given as prophylactic medications. Currently, the most commonly used drugs with anti-emetic effects are 5-HT3 antagonists, corticosteroids, and NK1 receptor antagonists.[7,8]

II. METHODS AND MATERIAL

This study is a cross-sectional study, it involved 100 patients and conducted at National Teaching Hospital for Oncology in Najaf province. The monitoring was conducted during the period from September 15 to November 15 .The patients were suffering from several tumors like bladder cancer, head and neck cancer, non-small cell lung , ovarian cancer and testicular cancer and on Chemotherapy. We took a table designed from several sections containing general information about the patients, for example, the patient's age, gender, the type of cancer, types of chemotherapy (drugs with dose strength), what anti-emetics he took, how many doses were taken and how long he continued taking them, and whether the patient is currently in the hospital or outside and whether he came to receive treatment or not. He came because he had complications due to illness or treatment.

Statistical analysis

The data analysis was performed using Microsoft Excel 2019. Microsoft Excel was used for editing, sorting, and coding. Descriptive statistics, frequencies, and percentage were used to summarize the result and presented using tables.

III.RESULTS AND DISCUSSION

The results show that nausea and vomiting are most prevalent in the 46-56 and 57-67 age groups (38% and 37%, respectively). This can be explained by factors like increased sensitivity to chemotherapy, slower metabolism, and comorbidities commonly seen in these age groups.[9] In contrast, younger patients (24-34 years) experienced a low incidence (5%), which may be due to less aggressive chemotherapy or more effective antiemetic treatment.[10]

TABLE I: The table presents the age distribution of the 100 participants involved in evaluating the prevention of nausea and vomiting in hospitalized patients with cancer.

Age	Number	Percent
24-34 years	5	**5%**
35-45 years	12	**12%**
46-56 years	38	**38%**
57-67 years	37	**37%**
68- 80 years	8	**8%**
Total	100	**100%**

Older patients (68-80 years) also showed low rates (8%), likely because they often receive less aggressive treatment and are closely monitored for side effects.[10]

TABLE II: The table presents the gender distribution of the 100 participants in the study.

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	male	45	45.0	45.0	45.0
	female	55	55.0	55.0	100.0
	Total	100	100.0	100.0	

However, women are more sensitive to vomiting than men, as the percentage of women was 55% and men were 45%, females considered risk factors to vomiting our study agreed with several studies and sources and referred to several reasons, including Hormonal Differences fluctuations in estrogen levels during the menstrual cycle may increase sensitivity to nausea. Studies have shown that higher estrogen levels can enhance the perception of nausea in women.[11]

TABLE III: The table presents the dosage form of antiemetics

Dosage form of antiemetics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Dosage form	injectable	68	68.0	68.0	68.0
	oral+ injectable	32	32.0	32.0	100.0
	Total	100	100.0	100.0	

Physiological Differences women metabolize medications differently than men, often resulting in higher drug concentrations in the bloodstream and prolonged clearance times. This can increase the likelihood of side effects such as nausea.[12]

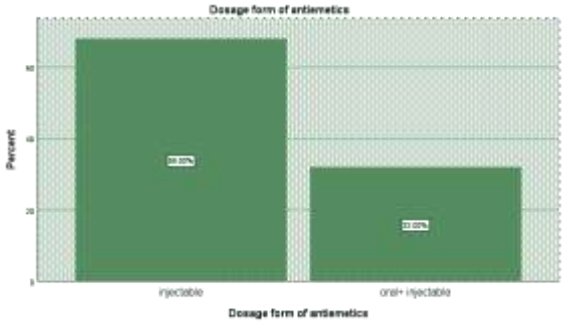

Fig.1: Dosage form of antiemetic.

TABLE IV: The table shows the duration of antiemetic , The percentages show the duration that is taken over 3 days is 92%, while those that are taken over two days is 8%:

Duration of antiemetics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Duration	for 2 days	8	8.0	8.0	8.0
	for 3 days	92	92.0	92.0	100.0
	Total	100	100.0	100.0	

TABLE V: The table shows the reasons for the patient's admission to the hospital.

Cause of admission	Number	Percent
For receive Chemotherapy	26	26%
Nausea, vomiting & diarrhea	14	14%
High Grade Fever	10	10%
Hyperglycemia	4	4%
Fever & Fatigue	6	6%
Dyspnea & Hypoxia	3	3%
Blood pressure↑	4	4%
Fever & Anorexia	3	3%
Anorexia, nausea & vomiting	3	2%
Hypoglycemia	2	2%
Fever & shortness of breath	2	2%
Others	23	23%
Total	100	100%

TABLE VI: The table shows Antiemetics that given for patient

Type of drug given for patient					
		Frequency	Percent	Valid Percent	Cumulative Percent
Drug type	Ondansetron 8mg/4mL alone	26	26.0	26.0	26.0
	Ondansetron 8mg/4mL, Dexamethasone 8mg/2mL	23	23.0	23.0	49.0
	Ondansetron 8mg/4mL, Dexamethasone 8mg/2mL, Apreptant 120mg/80mg/80mg tablet	20	20.0	20.0	69.0
	Ondansetron 8mg/4mL, metoclopramide 10mg/2ml	6	6.0	6.0	75.0
	Ondansetron 8mg/4mL, Apreptant 120mg/80mg/80mg tablet	4	4.0	4.0	79.0
	metoclopramid 10mg/2ml ,Ondansetron 8mg/4mL,Dexamethasone 8mg/2mL	16	16.0	16.0	95.0
	metoclopramid 10mg/2ml ,Ondansetron 8mg/4mL, Apreptant 120mg/80mg/80mg tablet	1	1.0	1.0	96.0
	metoclopramid 10mg/2ml ,Ondansetron 8mg/4mL,Dexamethasone 8mg/2mL, Apreptant 120mg/80mg/80mg tablet	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

The 68% use of injectable medications reflects their preference for immediate efficacy in managing acute CINV, particularly in high-emetogenic chemotherapy regimens, as recommended by NCCN, MASCC, and ASCO guidelines. Injectable treatments like ondansetron and dexamethasone are favoured for their rapid onset of action.[13] The 32% combination of oral and injectable forms highlights the use of injectables for initial symptom control followed by oral formulations for ongoing management, which aligns with studies suggesting this approach improves convenience and reduces hospital visits.[14]

TABLE XIII: The table shows the most common chemotherapy that cause nausea and vomiting, along with their common doses

Regimen of Therapy	Number	Percent
5-Fu 335.2 mg, 3840 mg, 4320 mg , 1800mg Fu bolus 628, 640	35	35%
Oxaplatin 111.2 mg, 136 mg, 152mg , 153 mg	24	24%
Leucovorin 268 mg, 358 mg, 516 mg, 640 mg, 720 mg	26	26%
Cisplatin 50 mg, 60 mg, 70 mg,	14	14%
Carboplatin 150 mg, 450mg, 770mg	14	14%
Cytarabin 1000mg, 3600 mg	7	7%
Bevacizumab 210 mg, 325 mg, 435 mg, 865 mg	9	9%
Trastuzumabum 372 mg, 440 mg, 540 mg	8	8%
Irinotecan 400mg	6	6%
Vincristine 2mg	8	8%
Docetaxel 67mg, 97 mg , 190 mg	5	5%
Gemcitabin 1600mg, 1800 mg	15	15%
Others	23	23%

Our study revealed that the most common type of cancer at Warith Center is breast cancer at 11%, followed by colon cancer at 10%. In contrast, the least observed types were lung cancer, prostate cancer, and cervical cancer, each accounting for 2%. While our findings

align with several other studies, this research was limited to a single healthcare center, and thus, the results cannot be considered representative at the local or international level.

According to Al-Mosawi AJ (2015–2018), breast cancer was the most prevalent type of cancer in Iraq, comprising 19.1% of the total registered cases in 2015 and 19.55% in 2016. Additionally, bronchial and pulmonary cancer was the second most common, accounting for 8.1% of cases in 2015.[13] Globally, Harbeck et al.[14] noted that breast cancer is the most frequent malignancy in women, with approximately 70–80% of early-stage, non-metastatic cases being curable. On the other hand, Chest Medicine (2011) identified lung cancer as the leading cause of cancer incidence and mortality in men, while in women, it ranked third in incidence and second in mortality.[15] Regarding prostate cancer, the World Journal of Oncology (2019) reported that it is the second most frequently diagnosed cancer in men and the fifth leading cause of cancer-related deaths worldwide.[16]

Duration of antiemetic for 3day take 92% but for 2day take 8% " American Society of Clinical Oncology Clinical Practice Guideline Update" explain Use of dexamethasone on the first day only in patients who were treated With doxorubicin and cyclophosphamide and for a longer duration in patients who were treated with other high-emetic-risk agents such as cisplatin. Our result like" International Journal of Clinical Oncology 26, 1-17, 2021" and "antiemetics American Society of Clinical Oncology Clinical Practice Guideline Update "Explained High-emetic-risk chemotherapeutics agents Adult patients who are treated with high-emetic-risk single agents such as cisplatin should be offered a four Drug combination of a neurokinin 1 (NK1) receptor antagonist, a serotonin (5-HT3) receptor antagonist, dexamethasone, And olanzapine. Dexamethasone and olanzapine should be continued on days 2 to 4,Moderate-emetic-risk chemotherapeutics agents Adult patients who are treated with carboplatin area under the curve (AUC) 4 mg/mL per minute should be Offered a three-drug combination of an NK1 receptor antagonist, a 5-HT3 receptor antagonist, and dexamethasone. Low-emetic-risk chemotherapeutics agents: Adult patients who are treated with low-emetic-risk chemotherapeutics agents should be offered a single dose of a 5- HT3 receptor antagonist or a single 8-mg dose of dexamethasone before treatment with chemotherapeutics agents.

Our study found ondansetron to be the most used antiemetic (26%), typically as a single agent. This aligns with other studies, such as Hesketh et al.[17] Which reported ondansetron monotherapy at 28%. However, NCCN, MASCC, and ASCO guidelines recommend dual therapy (ondansetron + dexamethasone) for moderate emetogenic chemotherapy and triple therapy (adding aprepitant) for high-risk regimens. Dual therapy was used in 23% of cases, and triple therapy in 20%, which is lower than the 35% use in other studies for highly emetogenic chemotherapy, suggesting a need for further alignment with guidelines.

Metoclopramide was used in 1% of cases, primarily in triple therapy. Its limited role is due to its lower efficacy compared to 5-HT3 receptor antagonists like ondansetron and its side effects, including extrapyramidal symptoms and sedation.[18] Clinical guidelines recommend metoclopramide mainly for breakthrough nausea or low-emetogenic chemotherapy.[19,20]

Dexamethasone, used in 23% of cases, is essential for acute and delayed CINV but is underutilized due to concerns about side effects like insomnia and weight gain. Studies suggest shorter dexamethasone regimens or combining it with NK1 receptor antagonists to enhance efficacy while minimizing risks.[21]

For 5-fluorouracil (5-FU), a low-to-moderate emetogenic agent, ondansetron alone was sufficient, aligning with studies on fluoropyrimidines. Conversely, cisplatin-based regimens require triple therapy due to their high emetogenic potential, highlighting the need to optimize antiemetic therapy for high-risk cases.[21]

IV.CONCLUSION

According to the results obtained from this study, we can conclude the following point:

1.The types of antiemetics used to treat nausea and vomiting that cause by chemotherapy are ondansetron , dexamethasone, metoclopramide, and Apreptant.

2. Antiemetics are given for a long period of 3 days or for a short period of one day or less depending on the emetogenicity of chemotherapy, as they are classified into high emetogenic, moderate emetogenic, and low emetogenic

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