



## Pattern of Post Chemotherapy Side Effects among Cancer Patients Hadhramout - Yemen

Nawal Saeed Banafa\*

Associate Professor Community Medicine, Fundamental Medical Sciences Department, Hadhramout University, Yemen

\*Corresponding Author: Nawal Saeed Banafa, Associate Professor Community Medicine, Hadhramout University, Yemen.

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### Abstract

**Background:** Chemotherapy is employed as part of a multimodal approach to the treatment of many tumors. Cancer patients are complain many real suffering after taken chemotherapy treatment.

**Goals:** The aim of this study is to assessment pattern of side effect post Chemotherapy treatment among cancer patients who attended to Hadhramout National oncology center (HNOC) Hadhramout –Yemen.

**Methods:** A descriptive cross-sectional study conducted to give a description of the post chemotherapy side effects among Patients who attended to (HNOC), the study sample were selected randomly, the data collected by a questionnaire filled by Patients themselves or relatives.

**Results:** seventy-five patients in two months were surveyed, their age ranging from 1 to > 60 years, mean age ( $3.41 \pm 1.264$  years) in which the majority were represented by 29.3% ranged between (31-45years), 70.7%were females, approximate half were illiterate, the minority was unemployed 7.7%, the study had revealed the common side effects of post chemotherapy treatment among cancer patients, represented respectively fatigue, hair loss, anorexia, nausea and vomiting 78.7%, 76%, 74.7 and 73.3%, followed by mood disorder 57.3% in addition to others for females, 22.7% had disturbance in menstrual period. The side effects occur mostly after 1 to 3 days 34.7%, persist for hours to a day is about 26.7% while 22.7% from 1-3 days, half of cases the side effects persist for more than 3days 50.7%.

**Conclusion:** Cancer is an important health issue influencing life, the most common side effects of chemotherapy most commonly fatigue, hair loss, loss of appetite, nausea and vomiting, and menstrual disturbance in females. For that to monitor the trends need activate the Cancer registry to Provide availability of the alternative drugs to management and reduce the side effects.

**Keywords:** Chemotherapy; Side Effects

### Abbreviation

HNOCO: Hadhramout National Oncology Center.

### Introduction

Cancer is the second leading cause of death globally, around 13% of all cancers, global burden rises to 14.1 million new cases and 8.2 million cancer-related deaths occurred in 2012, compared with 12.7 million and 7.6 million, in 2008, 2004 respectively [1]. The most common cancers [Lung (2.09 million) Breast (2.09 million) Colorectal (1,80 million) prostate (1-28 million) skin cancer (1.04 million) and Stomach (1.03million), more than 60%

of world's total new annual cases occur in Africa, ASIA and central and south America these regions account for 70% of the world's deaths. Deaths counting 9.6 million deaths in 2018, the most common causes of cancer deaths [Lung (1.76 million deaths), Colorectal (862,000 deaths), Stomach (783,000 deaths), Liver (782,000 deaths) and Breast (627,000 deaths). More than 70% of all cancer deaths occurred in low- and middle-income countries. Projections based on the GLOBOCAN estimates predict a substantive increase to 19.3 million of new cancer cases per year by 2025. Deaths from cancer worldwide are projected to continue rising, with an suspect estimation 11.5 million deaths by 2030 [2].

The word "Chemotherapy" is a type of medicine, use to treat cancer. The drugs are cytotoxic drugs, which means: they are toxic to the body's cells. The fastest growing parts of the patient will receive the most poison, and cancer grows very fast. Unfortunately, so do other parts of the body, which can be harmed through Chemotherapy (especially the hair, immune system, and digestive system). This is why people who are getting chemotherapy often lose their hair and throw up a lot. Chemotherapy kills the cells in the hair, causing the hair to fall out, and the chemotherapy kills cells in the lining of the stomach, but not every chemotherapy causes these side effects, Applying chemotherapy requires a careful balance, so that the patient does not die from it [3].

The field of cancer chemotherapy has undergone a drastic change in the past four decades with curative treatment been discovered for formerly fatal malignancies, such as lymphomas, leukemia's and testicular cancers. Chemotherapy had employed as part of a multimodal approach to the treatment of many tumors and it revolutionized with the advent of newer drugs [4].

Hadhramout National Oncology center (HNOC) is initiated in Mukalla city, in 2006 and its services provide for Hadhramout sector governorates (Hadhramout, Shabwa, Mahrah and Soqatra). The overall cases that registered at the HNOC through 2011-2018 attained to 4804 cases, 685 cases are the incidence at 2018, compared to 556,620 cases at 2016,2017 respectively, administered about 2956 chemotherapy doses in HNOC [5].

With present methods of treatment, one third of patients are cured with local modalities (surgery or radiation therapy), which are quite effective when the tumor has not metastasized by the time of treatment. Earlier diagnosis might lead to increased cure rates with such local treatment; however, in the remaining cases, early micro metastasis is a characteristic feature of the neoplasm, indicating that a systemic approach such as chemotherapy is required (often along with surgery or radiation) for effective cancer management. At present, about 50% of patients with cancer can be cured, with chemotherapy contributing to cure in 10–15% of patients. Cancer chemotherapy, as currently employed, can be curative in certain disseminated neoplasms that have undergone either gross or microscopic spread by the time of diagnosis. These cancers include testicular cancer, non-Hodgkin's lymphoma, Hodgkin's disease, and choriocarcinoma as well as childhood cancers such as acute lymphoblastic leukemia, Burkitt's

lymphoma, Wilms' tumor, and embryonal rhabdomyo sarcoma. There are also growing numbers of cancers in which the use of chemotherapy combined with initial surgery can increase the cure rate in locally advanced early-stage breast cancer, esophageal cancer, rectal cancer, and osteogenic sarcoma. For many other forms of disseminated cancer, chemotherapy provides palliative rather than curative therapy at present. Effective palliation results in temporary improvement of the symptoms and signs of cancer and enhancement in the overall quality of life. In the past decade, advances in cancer chemotherapy have also begun to provide evidence that chemical control of neoplasia may become a reality for many forms of cancer. This will probably be achieved through a combined-modality approach in which optimal combinations of Surgery, radiotherapy, and chemotherapy are used to eradicate both the primary neoplasm and its occult micro metastases before gross spread can be detected on physical or x-ray examination [3]. "The factors that influence the frequency and severity of oral side effect of cancer chemotherapy broadly divided into two major groups: those that are patient related and those that are therapy-related. Among the patient-related factors are type of malignancy, patient age, prechemotherapy condition of the mouth, and the level of oral care during chemotherapy, Therapy-related variables include those are related to the specific drug used for chemotherapy, the total dose of the drug, the timing of delivery of the chemotherapy, and concomitant therapy given with chemotherapy" [4]. In Yemen, there are few published studies, but some studies revealed the prevalence and most common cancers in southeastern governorates of Yemen [6,7]. So limitation of information and data about post chemotherapy side effects of cancer patients in Yemen specially Hadhramout. No studies had been previously reported on the pattern of post chemotherapy side effects in cancer patients in Hadhramout, Yemen. The aim of this study was to assessment post chemotherapy side effects patients among cancer patients attending (HNOC).

## Materials and Methods

A descriptive cross-sectional study was conducted, Hadhramout National Oncology Center (HNOC) was established to serve people in Hadhramout sector which consist of 4 governments (Hadhramout, Shabwa, Almahra and Socotra) with population of approximately 1,820,163 inhabitants, HNOC is consider the corner stone for the services and documentation of basic data of cancer patients. The study population was all patients who attend HNOC during the

study period 75 oncological patients evaluated. Inclusion criteria were patients with cancer (patients under treatment and follow up patients).

The data was collected from patients attend and registered in cancer program during taking treatment by used a questionnaire, the data consist socio-demographic data (Age, Sex, Educational qualification, marital status, occupation and residency). Another part of questionnaire consist of the general activities and the list of the side effects. All variables were processed and analyzed using Statistical Package for Social Sciences (SPSS® version 20), frequency distribution, mean, standard deviation. Chi-square, T student test analyzed considering significant the value of  $p < 0.05$ .

**Ethical consideration**

It was obtained Written permission was sought from the director of HNOc, and the patients included in the scope of the study was informed clarify the objective of the study, that the information were collected will be used for scientific and research purpose only, and the Privacy and confidentiality of their Information respected during analysis.

**Results and Discussion**

**Results**

Seventy five oncologic patients were evaluated during the period between 1st October – 31 December 2018, their age ranging from (1 to > 60 years) with a mean age and its standard deviation was (3.41 ± 1.264 years), 29.3% ranged between (31-45years), followed by age group > 60 and 46-60 years, (25.3%, 22.7) respectively, 53 (70.7%) were females and 22(29.3%) males, half of them were illiterate, also 37 (56.9%) were married, 42 (64.6%) were house wife table 1. The most common side effects represented respectively fatigue, hair loss, anorexia, nausea and vomiting 78.7%, 76%, 74.7 and 73.3%, followed by mood disorder 57.3% in addition to other side effects ranged between 12% to half of cases (50%), for females 22.7% disturbance in menstrual period table 2.

The total number of cases admitted in hospital after chemotherapy treatment 42.7%, from there 14.7% for 1-3 days and more than 6 days, 13.3% for 4-6 days. Forty two percent took

more than six chemotherapy doses, 32% (4to 6) doses, where 25.3% (1 to 3 doses) table 3. The daily activities as exercise were affected before treatment was 18.7% and after treatment, the patients still exercised 2.7%. Before treatment 4% of cases had pregnancy, the pregnancy was affected within and after treatment, in, other side after treatment the usual activities were changed in 33.3% patients like work and occupation, in contrast the social relations not affected. However 41.3% admitted in hospital before given a chemotherapy dose the remaining came to hospital at day of chemotherapy table 4.

Variable	Frequency	%	mean
<b>Age</b>			
1-15 year	7	9.3	3.41
16-30 year	10	13.3	
31-45 year	22	29.3	
46-60 year	17	22.7	
>60	19	25.3	
<b>Sex</b>			
Male	22	29.3	1.71
Female	53	70.7	
<b>Level of education</b>			
Illiterate	33	44.0	1.73
primary education	32	42.7	
Secondary school	7	9.3	
university and above	3	4.0	
<b>Marital state</b>			
Single	14	21.0	1.85
Married	45	60.0	
Widower	8	10.7	
Divorced	1	1.3	
<b>Occupation</b>			
not work	54	72.0	1.35
special work	16	21.3	
employed work	5	6.7	

**Table 1:** The demographic characteristics distribution of patients in Hadhramout National Cancer Center (n=75).

Side effect	*Yes		*No		Mean	t-test for Equality of Means					
	Freq	%	Freq	%		t	df	Sig.	Mean Difference	95% Confidence Interval of the Difference	
										Lower	Upper
Nausea and Vomiting	55	73.3	20	26.7	1.27	.643	73	.522	.073	-.153	.299
Hair loss	57	76.0	18	24.0	1.24	2.923	73	.005	.304	.097	.511
Fatigue	59	78.7	14	18.7	1.16	-.300	73	.765	-.033	-.255	.188
Diarrhea	33	44.0	42	56.0	1.56	.851	73	.398	.108	-.145	.361
Constipation	30	40.0	45	60.0	1.60	-1.665	73	.100	-.206	-.452	.041
Mood disorder	43	57.3	32	42.7	1.43	-.704	73	.484	-.089	-.342	.163
Low temperature	23	30.7	52	69.3	1.69	-1.235	73	.221	-.145	-.379	.089
High temperature	37	49.3	38	50.7	1.51	.933	73	.354	.119	-.135	.374
Anorexia	56	74.7	19	25.3	1.25	-.330	73	.742	-.037	-.260	.186
Loss weight	34	45.3	41	54.7	1.55	-1.546	73	.126	-.195	-.446	.056
Lack of sexual desire	19	25.3	38	50.7	1.27	.651	73	.517	.137	-.283	.557
Hemorrhage	9	12.0	66	88.0	1.88	-.267	36.214	.791	-.023	-.199	.153
Menstrual disturbance	17	22.7	23	30.7	.84	-6.856	73	.000	-1.189	-1.534	-.843
Change in nails	30	40.0	45	60.0	1.60	.409	73	.684	.051	-.199	.302
Redness in skin	18	24.0	57	76.0	1.76	.164	73	.870	.018	-.201	.237
Difficult in swelling	36	48.0	39	52.0	1.52	-1.235	73	.221	-.157	-.410	.096
Face Paler	38	50.7	37	49.3	1.49	-.933	73	.354	-.119	-.374	.135
Headache	41	54.7	34	45.3	1.45	2.662	39.878	.011	.323	.078	.569
Ulceration in mouth	31	41.3	44	58.7	1.59	-.461	73	.646	-.058	-.310	.194
Change urine color to redness	35	46.7	40	53.3	1.53	-.874	73	.385	-.111	-.366	.143

Table 2: Side effects after chemotherapy among patients in HNOC.

\*The respondents select more than one option

Variable	freq	%	mean	Chi	Df	Sig(2side)
<b>Duration of hospitalization</b>				12.545 <sup>a</sup>	6	0.051
1-3 day	11	14.7	.85			
4-6 day	10	13.3				
more than 6	11	14.7				
<b>Doses of chemotherapy had patient taking</b>				2.17		
1-3	19	25.3				
4-6 d	24	32.0				
> 6	32	42.7				

Table 3: Distribution of period of hospitalization and chemotherapy doses.

Variable	Yes		No		Mean
	Fre- quency	%	Fre- quency	%	
Exercise before treatment	14	18.7	59	78.7	1.76
Exercised after treatment	2	2.7	13	17.3	.37
Pregnancy before treatment	3	4.0	20	26.7	.57
Pregnancy affected within or after treatment	3	4.0	3	4.0	.12
Changed in usual patient, activities, work and Occupation after treatment	25	33.3	50	66.7	1.67
Affect of patient relationship	12	16.0	62	82.7	1.81
Hospitalized before taking chemotherapy	33	42.7	42	57.3	1.56

**Table 4:** Patients activities and their general status pre and post chemotherapy.

After 1 - 3 days appearance the side effects mostly occur in 34.7%, 28% after hours up to 24 hours, minority after 3 days represented by 18.7%, the continuity of side effect from hours to a day is about 26.7% while 22.7% from 1-3 days and half of cases persist for more than 3 days table 5. More than half were not receive blood transfusion after chemotherapy treatment; only 18.7% received blood once. for minimize and manage side effects

the majority use medications 72%, 6.7% use traditional treatment table 6. Table 7 the occurrence of side effects is no correlate with the period of continuity of side effects.

Variable	Frequency	%	mean
Appearance of side effect			
During chemotherapy	14	18.7	2.53
After hours to day	21	28.0	
1-3 days	26	34.7	
>3days	14	18.7	
Continuation of side effects			
Hours to day		26.7	2.24
1-3days		22.7	
>3days		50.7	

**Table 5:** Appearance and continuation of side effect after chemotherapy.

Variable	Frequency	%	Mean
Blood transferred after treatment			
Once	14	18.7	2.36
more than once	20	26.7	
Never	41	54.7	
Type of treatment that patient resort side effect			
medical treatment	54	72.0	1.49
traditional medicine	5	6.7	
Never	16	21.3	

**Table 6:** Distribution of blood transfusion to patient after chemotherapy and type of treatment that patient resort side effect.

Variable	Hours to day	Occurrence of side effect			Total	Chi square	Df	Correlation Sig. (2-sided)
		1-3 days	>3days					
Continuation of side effects	During chemotherapy	5	1	8	14	12.545 <sup>a</sup>	6	.051
	After hours to day	10	5	6	21			
	1-3 days	4	6	16	26			
	More than 3days	1	5	8	14			
Total		20	17	38	75			

**Table 7:** Correlation occurrence of side effect by continuation of side effects after chemotherapy.

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is 3.17.

## Discussion

Cancer chemotherapy often lead to side effects in the majority of cancer Patients these side effects are quite challenging for patients and providers to manage and often have a negative impact on quality of life [8]. Most of patients are in age [(31-45) s.d  $\pm$  1,264] where there is a coincide with previous study done in Hadhramout shows that age (36-54) years is the most group had cancer, the side effects are more present in female with mean (1.4663) than male (1.7320) because of most of sample are females [5]. Another reason maybe regards to physiological causes similar to a study in Ethiopia Where females are more than males (female 53% in HNOC where in Ethiopia 58% [9,10]. Regarding the educational level, most patients are illiterate. It's different from study done in Oman that had most of patients were in primary school (65%) [11]. Married patient are high group in the study nearly similar to study in Oman [12]. For occupation majority of patients are unemployed where difference from study done in Oman showed that they were (53.5%) [12], Chemotherapy induced fatigue is the most common side effect [1], followed by hair loss, nausea and vomiting. Changes in patient's daily activities, work and occupation after treatment, most of patients never receive blood transfusion (54.7%) and it's in contrast to American Cancer Society that chemotherapy drugs affect cells in the bone marrow this leads to low blood cell counts, and risk for life-threatening, infections, or bleeding [14].

The findings of this study showed that there was no significance correlation between appearance of side effects and continuity of it, may be due to absorption of drug used in chemotherapy, body defense and endurance, type of drug, patient's age and body mass and dose of drugs [15].

## Conclusion

The present research conclude that 21 most common side effects are fatigue then hair loss, nausea and vomiting lowest one was hemorrhage. After 1-3 days side effects were occurs, some cases need hospitalization after dose of chemotherapy for 1-3 days. Most of them stop exercise and daily usual activities after chemotherapy the pregnancies were affected before and after chemotherapy.

We look forward to more further studies, we hope that identifying and minimizing or preventing both short and longer term side effects from cancer chemotherapy will be better tolerated

and more affective and the health and wellness of cancer survivors will be enhanced.

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## Conflict of Interest

The author declare that the research conducted in the absence of any financial relationship that could be constructed as a potential conflict of interest.

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