

Prechemotherapy Expectations as a Predictor of Side Effects in Breast Cancer Patients

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Abstract

Introduction or Background: Side effect (SE) is a major drawback of chemotherapy. Apart from the effect of the drugs, it has been suggested that patient's pretreatment expectation contributes to the severity of some SEs. The aim of this study is to assess whether prechemotherapy expectations can predict reported SEs in breast cancer patients. **Patients, Materials and Methods:** This is a prospective study involving 101 breast cancer patients scheduled for chemotherapy at the University College Hospital, Ibadan. Before chemotherapy was given, they were asked to state the SEs; they expect from the treatment and the SEs; they anticipate will be the most difficult to cope with. Patient's self-reported SEs were then collated three weeks after the completion of the prescribed courses of chemotherapy. The responses were compared and subjected to relevant statistical analysis for inferential purposes. **Results:** The age ranges from 22 to 78 years with peak ages between 40 and 59 years. There was a positive association between patients' pretreatment expectations and their posttreatment reports of vomiting ($P = 0.015$) but not with fatigue ($P = 0.112$), hair loss ($P = 0.372$), diarrhoea ($P = 0.720$), and loss of appetite ($P = 0.221$). Before treatment, hair loss was expected to be the most difficult to cope with in 58 (52.7%) patients; however, only 3 (3.0%) patients reported it as such afterward. Fatigue was anticipated as likely to be the greatest difficulty by only 3 patients (3.0%) before treatment but was finally rated as such by 74 (73.3%) patients afterward. **Conclusion:** Pretreatment expectation of vomiting was associated with its occurrence. Pretreatment expectation should be factored in when counselling patients for chemotherapy.

Keywords: Chemotherapy, expectations, predictor, side effects

INTRODUCTION

Chemotherapy is an integral part of breast cancer management. It has been proven that chemotherapy enhances tumour control and improves survival of cancer patients.^[1-4] Chemotherapy side effect (SE), however, remains a huge burden for patients receiving the treatment.^[5] To reduce the impact of these SEs, patients are well informed of the likely SEs.^[6] Patients who had good knowledge about the SE tend to recover faster and cope better with the treatment.^[7] Chemotherapy premedications have been associated with absence or reduction in postchemotherapy SEs.^[8] In recent time, there has been improvement in these medications, but a large number of cancer patients still experience the SEs at some point during their treatment.^[5] If not properly addressed, these could increase the chance of occurrence of chemotherapy adverse events such as hospitalisation, treatment delay, or discontinuation.^[8]

The frequency and severity of chemotherapy have been observed to vary with the pharmacology of the medication and patients-related factors such as age, performance status, and presence of comorbidity.^[5] Patients receiving the same chemotherapy regimen can report varying severity of SEs which could not be fully explained by pharmacology, suggesting the possibility of the psychological influence.^[9] For example, some cancer patients start experiencing nausea and vomiting shortly before the commencement of chemotherapy

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infusion.^[5,10] This most likely did not result directly from the pharmacology of the medication but some psychological factors like acute attack of anxiety resulting in “psychogenic” nausea and vomiting.^[11]

Cancer patient’s pretreatment expectation can also contribute to the development of some treatment-related SEs during treatment.^[12] The most studied symptoms are nausea and vomiting though there have also been some reports that pretreatment expectations of sleeping difficulty, change of appetite, and fatigue can also predict their occurrence during treatment.^[5,10] To reduce the impacts of this negative expectation, it has been suggested that caution should be taken while preparing cancer patients for chemotherapy so as not to induce unnecessary fear and anxiety which can predispose them to the SEs.^[7] Furthermore, the increasing awareness of cancer and its treatments, especially from unofficial sources such as internet, films, documentaries, friends, and families, can aid the development of these negative expectations.^[11,13] These suggest the need to explore patients’ pretreatment expectations with the aim of identifying the symptoms involved and provide background for interventions that can challenge these potentially maladaptive expectations.

Most of the studies on cancer patient’s expectation of chemotherapy SEs were conducted in the western countries.^[5,9,14-16] Due to sociocultural differences, it may be inappropriate to generalise their findings to native African population. This study will therefore help to fill the knowledge gaps between findings in developed countries and Nigeria which could help to improve on the pretreatment counselling. The aim of this study is to assess the SEs expected by breast cancer patients before chemotherapy and relate it to the occurrence of such SEs during treatment.

PATIENTS, MATERIALS AND METHODS

This prospective study was carried out at the oncology clinics of the University College Hospital, Ibadan, South West Nigeria. The study population comprised of chemotherapy naïve patients with histologically diagnosed breast cancer scheduled to receive chemotherapy. Patients who were aged 18 years and above with Eastern Cooperative Oncology Group performance status ≤ 1 were included in the study. Patients on concurrent radiotherapy, hormonal therapy, or with metachronous or synchronous malignancies were excluded from the study. Ethical approval was gotten from joint ethical review committee of the institution with approval number UI/EC/18/0227.

One hundred and one eligible participants were recruited to participate in the study having signed an informed consent form. Patients’ sociodemographic and clinical data were extracted from the review of the case notes. Before commencing the first course of chemotherapy, participants were asked to state the SEs; they expect from the chemotherapy and the SEs; they anticipate will be the most difficult to cope with. Self-reported SEs and their corresponding difficulties were assessed three weeks after.

Data were collected with the aid of interview-administered questionnaires and analysed using the IBM Statistical Package for the Social Sciences Version 21.0. (Armonk, NY). The result was presented in frequency distribution tables, charts, and cross-tabulations. Chi-square test was used for comparison of the response before and after chemotherapy. Multiple linear regression analysis was used to adjust for confounders in statistically significant variables on univariate analysis. The level of significance was set at $<5\%$ (0.05).

RESULTS

Patient demographics

A total of 101 breast cancer patients participated in this study. The age ranges from 22 to 78 years with peak ages between 40–49 years and 50–59 years [Table 1]. All the patients were females. About half of the patients 51 (50.5%) had tertiary education, 34 (33.7%) had secondary education, 9 (8.9%) had primary education while 7 (6.9%) had no formal education. Majority of the patients were either trader 57 (51.8%), civil servant 34 (30.9%) or artisan 12 (10.7%). As regard the body

Table 1: Patient’s sociodemographic variables

Variables	Frequency (%)
Age (years)	
20–29	1 (1.0)
30–39	20 (19.8)
40–49	30 (29.7)
50–59	30 (29.7)
60–69	14 (13.9)
70–79	6 (5.9)
Sex	
Female	101 (100.0)
Male	0
Level of education	
Primary	9 (8.9)
Secondary	34 (33.7)
Tertiary	51 (50.5)
No formal education	7 (6.9)
Occupation	
Trader	57 (51.8)
Civil servant	34 (30.9)
Artisan	12 (10.9)
Farmer	4 (3.6)
Others	3 (2.7)
Ethnicity	
Yoruba	80 (79.2)
Igbo	10 (9.9)
Hausa	2 (2.0)
Others	9 (8.9)
BMI	
Underweight (<18.5)	1 (1.0)
Normal (18.5–24.9)	36 (35.6)
Overweight (25–29.9)	36 (35.6)
Obese (≥ 30)	28 (27.7)

BMI: Body mass index

mass index (BMI), 1 (1.0%) was underweight, 36 (35.6%) were normal, another 36 (35.6%) were overweight while 28 (27.7%) were obese [Table 1].

The patient's disease and treatment information

Primary tumour was on the right in 51 (50.5%) and on the left in 45 (44.6%) while the rest had bilateral diseases. The dominant histological pattern was invasive ductal carcinoma seen in 95 (94.1%) of patients. As regard stage of disease, 10 (19.9%) presented with Stage II, 64 (63.4%) with Stage III while 25 (24.8%) presented with Stage IV. None of the patients presented at Stage I.

Most of the patients 64 (58.2%) have had surgery previously while 6 (5.9%) have previously had hormonal therapy. It is noteworthy that 37 (36.6%) of patients took alternative medicine (AM) after the cancer diagnosis before presenting for treatment.

The most prescribed chemotherapy combination was cyclophosphamide with anthracyclines in 63 patients (65.3%), followed by taxane with platinum in 25 (24.8%) and gemcitabine with platinum in 6 patients (5.5%). Four patients received taxane as a single agent treatment [Table 2].

Relationship between patients' pretreatment expectations and posttreatment

Before starting the first course of chemotherapy, patients were asked to mention SEs; they expected from the chemotherapy. Patients mentioned between 0 and 6 SEs; these included 16 different side-effects. The most common expected SEs were alopecia 72, vomiting 65, skin changes 28, loss of appetite 24, fatigue 22, and diarrhoea 16. Others included nail discoloration 3, fever 3, pain 3, sore throat 3, weight loss 2, amenorrhoea 1, itching 1, infertility 1, epistaxis 1, and fainting 1. Four patients also mentioned death as expected SE.

Six of the most expected SEs were selected for this analysis.

There was a positive association between patients' pretreatment expectations and posttreatment reports of vomiting ($P = 0.015$) but not with fatigue ($P = 0.112$), hair loss ($P = 0.372$), diarrhoea ($P = 0.720$), skin changes ($P = 0.478$), and loss of appetite ($P = 0.221$) [Table 3].

Logistic regression was performed to test if pretreatment expectation of vomiting is a predictor of its occurrence posttreatment [Table 4]. After adjusting for other covariates such as age, level of education, chemotherapy regime, and BMI, pretreatment expectation of vomiting was shown to be statistically significant related to occurrence of vomiting following treatment.

Before chemotherapy, patients were also asked to state which one SE was anticipated to be the most difficult to cope with. Three weeks after chemotherapy, patients were asked to mention the SE they experienced to be the most difficult to cope with.

Pretreatment, 3 (3%) patients anticipated weakness or fatigue as likely to be the greatest difficulty, however, posttreatment, they were rated most difficult by 74 (73.3%) patients. Before treatment, hair loss was expected to be the most difficult to cope

Table 2: Patient's disease and treatment characteristics

Variable	Frequency (%)
Laterality of primary tumour	
Right	51 (50.5)
Left	45 (44.6)
Both	5 (4.9)
Histology	
Invasive ductal carcinoma	95 (94.1)
Others	6 (5.9)
Stage	
II	10 (9.9)
III	64 (63.4)
IV	25 (24.8)
Not specified	2 (2.0)
Previous treatment	
Surgery	58 (57.4)
Hormonal therapy	6 (5.9)
Alternative medicine	37 (36.6)
Present chemotherapy regimen	
Cyclophosphamide + anthracycline	63 (65.3)
Taxane + platinum	25 (24.8)
Gemcitabine + platinum	6 (5.5)
Taxane	4 (4.0)
Others	2 (1.8)

Table 3: Relationship between patient's pretreatment expectations and posttreatment reports of vomiting, fatigue, hair loss, diarrhoea, skin changes, and loss of appetite

Expected side effects	Experienced SE		P
	Yes	No	
Vomiting (65)			
Yes	20	45	0.015*
No	20	16	
Loss of appetite (24)			
Yes	22	2	0.221
No	63	14	
Diarrhoea (16)			
Yes	5	11	0.720
No	29	56	
Fatigue (22)			
Yes	22	0	0.112
No	74	5	
Alopecia (72)			
Yes	68	4	0.372
No	24	4	
Skin changes (28)			
Yes	19	9	0.478
No	46	27	

*Significant. SE: Standard error

Table 4: Logistic regression of expected vomiting, age, level of education, chemotherapy regime, body mass index, and posttreatment occurrence of vomiting

Variable	OR	P	95% CI	
			Lower	Upper
Expected vomiting	3.084	0.016*	1.231	7.727
Age	0.633	0.994	0.953	1.030
Educational status				
At least secondary school	6.253	0.042*	1.069	33.803
Chemotherapy regime				
Cyclophosphamide + anthracyclines	2.932	0.051	0.995	8.639
BMI	0.984	0.778	0.878	1.102

*Significant. CI: Confidence interval, OR: Odds ratio, BMI: Body mass index

with in 58 (52.7%) patients; however, only 3 (3.0%) patients reported it as such after treatment [Figure 1].

DISCUSSION

This study was design to explore the effect of pretreatment expectation on the occurrence of SE following chemotherapy. Patients expected between 0 and 6 SE with median of 3. Hofman *et al.* reported a median of 9 SE in a similar study conducted in the United States.^[12] The lower expectation in our study may be due to lower level of education in our patients when compared with patients in the United States. Patients' expectation about chemotherapy SEs has been shown to be positively related to patients' knowledge and education.^[7,12,17] This is not surprising because one need to know about existence of a SE before one can expect such SE.

Patients reported 16 expected different SEs. It is worthy of note that four patients reported death as a possible SE of chemotherapy. These four patients most likely got their information from unofficial sources such as Internet, films, friends, and families. Such information from unofficial sources can cast fear in the mind of patients leading to late presentation or abscondment from treatment.^[11,13,18] It is, therefore, important to ask patients about their expectation before chemotherapy, with the aim of correcting wrong expectations and allaying their fears without concealing the fact about the treatment.

Pretreatment expectation of vomiting was found to be a good predictor of postchemotherapy vomiting even after adjusting for other covariates. This agrees with the finding of a study in the United States by Colagiuri and Zachariae which demonstrated that pretreatment expectation predisposes to increase urge of vomiting during chemotherapy.^[5,10,11] Having too high expectation about chemotherapy, SEs could predispose the patients to anxiety which could influence the occurrence of the SEs.^[7] This negative expectation can be aided by patients knowledge, especially those gotten from unofficial sources.^[11,13] Discussions on patient's expectations regarding SEs should be a part of the chemotherapy education.^[12] This would allow for the identification of highly expectant patients and provide an excellent opportunity to discuss and challenge these potentially maladaptive expectations.^[10] Addressing this

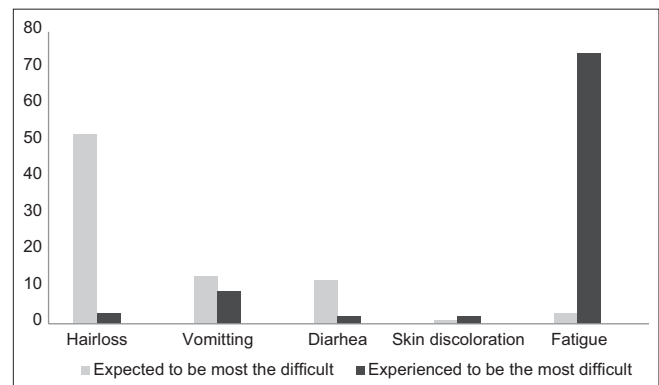


Figure 1: Five SEs expected and experienced to be most difficult to cope with. SEs: Side effects

psychological influence will reduce the need for additional pharmacological intervention. Such discussion should be done by experienced hands.

Hair loss was the SE that was anticipated to be the most difficult to cope with before chemotherapy. This is similar to the finding of Tierney *et al.* in a previous study conducted among Caucasians.^[14] This did not come as a surprise because most breast cancer patients are women. Maree and Mulonda reported that women in Zambia receiving chemotherapy for breast cancer considered hair loss during treatment as culturally unacceptable.^[19] This can result in patients defaulting from chemotherapy for traditional and less invasive unorthodox treatment. After treatment, fatigue was reported as the most difficult SEs experienced. It certainly was not expected that tiredness would emerge as such a difficulty for so many patients. Fatigue is an under-rated problem associated with chemotherapy because not being viewed as a hazardous side-effect, it is not inquired about on a routine basis.^[20] This finding suggests the need to pay more attention to cancer-related fatigue.

One unexpected finding in this study is the use of AM in our patients. More than a third, 36.6% of the patients took AM as a form of treatment for their breast cancer before coming to the hospital. Koçaşlı and Demircan in Turkey also reported similar high rate of AM use among cancer patients.^[21] It was suggested

that health professionals need to obtain information regarding the use of herbal products by cancer patients because the incidence of morbidity and mortality might be increased due to polypharmacy and drug interactions.^[21] Majority of patients will not mention their use of AM to their doctors – partly because the doctor did not ask.^[22]

Clinical implication

This study has improved the knowledge about the effect of anticipated SEs to chemotherapy in a subset of Nigerian breast cancer patients. Pretreatment expectation of vomiting was associated with its occurrence. It is, therefore, important to assess the expectant of vomiting for possible psycho-oncology intervention. This study has been able to show that the most anticipated SEs were not difficult to cope with following treatment. It also revealed that some unanticipated SEs might be difficult to manage by patients as seen by a high percentage of patients reporting fatigue as a SE of concern. This will enable the oncologist to improve the pretreatment counselling and management of patients' expectations.

CONCLUSION

Patients' pretreatment expectation of SEs as a predictor of SEs in breast cancer patients showed statistically significant only for vomiting. Fatigue was the most distressing SE noted compared to decreased incidence of hair loss that was anticipated to be the most difficult SE to cope with before chemotherapy. Pretreatment counselling by experienced practitioners can help manage expectations of SEs, allay needless anxieties, and lighten the SE burden of cancer chemotherapy.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Breast Cancer Treatment Protocols: Localised Disease, Adjuvant Chemotherapy, HER2/neu+Localised Disease, Adjuvant Chemotherapy, HER2/neu- Localised Disease; 15 January, 2018. Available from: <https://emedicine.medscape.com/article/2006464-overview#a2>. [Last accessed on 2018 Jan 15].
- Korde LA, Somerfield MR, Carey LA, Crews JR, Denduluri N, Hwang ES, *et al.* Neoadjuvant chemotherapy, endocrine therapy, and targeted therapy for breast cancer: ASCO guideline. *J Clin Oncol* 2021;39:1485-505.
- Bayat Mokhtari N, Salek R, Homae Shandiz F, Shahidsales S. Adjuvant chemotherapy of early stage breast cancer in community-based cancer treatment fields: CMF compared with anthracycline/taxane-based regimens. *Middle East J Cancer* 2017;8:83-91.
- Gandhi S, Fletcher GG, Eisen A, Mates M, Freedman OC, Dent SF, *et al.* Adjuvant chemotherapy for early female breast cancer: A systematic review of the evidence for the 2014 cancer care Ontario systemic therapy guideline. *Curr Oncol* 2015;22:S82-94.
- Colagiuri B, Zachariae R. Patient expectancy and post-chemotherapy nausea: A meta-analysis. *Ann Behav Med* 2010;40:3-14.
- Abdus-Salam A, Ntekim A, Folorunso S, Folasire A, Jimoh M, Adenipekun A. Pre-treatment knowledge and side effects of chemotherapy for breast cancer in a Nigeria tertiary hospital. *J Niger Med Assoc* 2021;62:202-7.
- Adenipekun A, Elumelu-Kupoluyi T, Omoyeni N, Soyannwo O. Knowledge and experience of cancer patients receiving chemotherapy in a teaching hospital in Nigeria. *Internet J Pain Symptom Control Palliat Care* 2012;9:14347-9.
- Nyrop KA, Deal AM, Shachar SS, Basch E, Reeve BB, Choi SK, *et al.* Patient-reported toxicities during chemotherapy regimens in current clinical practice for early breast cancer. *Oncologist* 2019;24:762-71.
- Whitford HS, Olver IN. When expectations predict experience: The influence of psychological factors on chemotherapy toxicities. *J Pain Symptom Manage* 2012;43:1036-50.
- Colagiuri B, Roscoe JA, Morrow GR, Atkins JN, Giguere JK, Colman LK. How do patient expectancies, quality of life, and postchemotherapy nausea interrelate? *Cancer* 2008;113:654-61.
- Rodríguez M. Individual differences in chemotherapy-induced anticipatory nausea. *Front Psychol* 2013;4:502.
- Hofman M, Morrow GR, Roscoe JA, Hickok JT, Mustian KM, Moore DF, *et al.* Cancer patients' expectations of experiencing treatment-related side effects: A university of Rochester cancer center – Community clinical oncology program study of 938 patients from community practices. *Cancer* 2004;101:851-7.
- Boder JM, Elmabrouk Abdalla FB, Elfageih MA, Abusaa A, Buhmeida A, Collan Y. Breast cancer patients in Libya: Comparison with European and central African patients. *Oncol Lett* 2011;2:323-30.
- Tierney AJ, Taylor J, Closs SJ. Knowledge, expectations and experiences of patients receiving chemotherapy for breast cancer. *Scand J Caring Sci* 1992;6:75-80.
- Devlin EJ, Denson LA, Whitford HS. Cancer treatment side effects: A meta-analysis of the relationship between response expectancies and experience. *J Pain Symptom Manage* 2017;54:245-58.e2.
- Lorusso D, Bria E, Costantini A, Di Maio M, Rosti G, Mancuso A. Patients' perception of chemotherapy side effects: Expectations, doctor-patient communication and impact on quality of life – An Italian survey. *Eur J Cancer Care (Engl)* 2017;26:e12618.
- Abdel-Razaq W, Alzahrani M, Bustami R, Alolah Y, Almutlag M. Exploring patient's perceptions of cancer chemotherapy side effects. *Education* 2017;60:60.
- Oladeji AA, Atalabi OM, Jimoh MA, Ntekim IA, Elumelu TN. Delay in presentation of cancer patients for diagnosis and management: An institutional report. *Internet J Oncol* 2017;13:1-7. Available from: <http://ispub.com/IJO/13/1/44745>. [Last accessed on 2021 Mar 16].
- Maree JE, Mulonda J. My experience has been a terrible one, something I could not run away from: Zambian women's experiences of advanced breast cancer. *Int J Afr Nurs Sci* 2015;3:24-30.
- Tierney AJ, Leonard RC, Taylor J, Closs SJ, Chetty U, Rodger A. Side effects expected and experienced by women receiving chemotherapy for breast cancer. *BMJ* 1991;302:272.
- Koçaşlı S, Demircan Z. Herbal product use by the cancer patients in both the pre and Post surgery periods and during chemotherapy. *Afr J Tradit Complement Altern Med* 2017;14:325-33.
- Aliyu UM, Awosan KJ, Oche MO, Taiwo AO, Jimoh AO, Okufo EC. Prevalence and correlates of complementary and alternative medicine use among cancer patients in Usmanu Danfodiyo University teaching hospital, Sokoto, Nigeria. *Niger J Clin Pract* 2017;20:1576-83.