



Impact of Pharmacist's Intervention on clinical outcomes Improvement in Patients with Breast Cancer

A Thesis

Submitted for the fulfillment of the

Master degree

*In Pharmaceutical sciences
(Clinical pharmacy)*

By

Dina Khaled Farrag ABD El Aziz
*Bachelor of pharmaceutical sciences
Ain-shams University, 2007*

Under supervision

Prof. Dr. Nagwa Ali Sabri

*Professor and Head of Clinical Pharmacy Department
Faculty of pharmacy, Ain-Shams University*

Dr. Amr Shafeek Tawfik

*Associate professor of oncology and Nuclear Medicine
Faculty of Medicine, Ain-Shams University*

Dr. Sara Mahmoud Zaki

*Associate professor of Clinical pharmacy
Faculty of pharmacy, Ain- Shams University*

2020



سورة البقرة الآية: ٣٢



First, I am deeply thankful to “**Allah**” by the grace of whom, this work was possible.

I would like to deeply thank and appreciate **Dr. Nagwa Ali Sabri**, Professor of clinical pharmacy, Faculty of Ain-Shams University, for her sincere help, and continuous support. She devoted a lot of her precious time for supervision, valuable guidance and continuous encouragement in completing this work.

I am particularly thankful to **Dr Sara Mahmoud Zaki**, Associate professor of clinical pharmacy, Faculty of pharmacy Ain –Shams University, for her indispensable guidance in choosing, initiating, and supervising this work.

I do feel greatly indebted to **Dr Amr Shafik**, Associate professor of clinical oncology, Faculty of Medicine, Ain-Shams University, for his guidance, great help and much support in directing this work.

I would like to thank all members of clinical pharmacy Department, Faculty of pharmacy, Ain- shams University, for their valuable assistance, cooperation and Advice during the study.

Finally, I wish to express my thanks to my Family for their kind and sincere help, love and support during the progress of this work.

List of Content

Title	Page No.
List of Tables	i
List of Figures.....	iii
List of Abbreviations	iv
Abstract	1
Introduction	2
Review of Literature	5
▪ Breast Cancer	5
▪ Definition	5
▪ Epidemiology.....	6
▪ Pathophysiology.....	7
▪ Risk factors	10
▪ Histopathological classification.....	14
▪ Prognosis	16
▪ Diagnosis.....	20
▪ Prevention	21
▪ Screening.....	24
▪ Management.....	26
▪ Quality of life of patients of breast cancer	43
Aim of the Work.....	53
Patients and Methods.....	54
Results.....	70
Discussion.....	93
Summary	98
References.....	100
Arabic Summary	-

List of Tables

Table No.	Title	Page No.
Table (1):	Example of an adverse event grades from NCI-CTCAE v4.03	61
Table (2):	TNM Staging system for breast cancer ABIM Foundation	62
Table (3):	Scoring of EORTC-QLC-C23 version 1.0	68
Table (4):	The demographic data and performance status of patients Participated in the study	70
Table (5):	The baseline medical data of patients participated in the study	71
Table (6):	The risk factors of patients participated in the study	72
Table (7):	Chemotherapeutic Protocols applied during the study	73
Table (8):	Medication taking behavior among patients to their treatments	74
Table (9):	The percentage of Drug_Drug interactions of patients In the study	75
Table (10):	The percentage of Food -Drug interactions of patients In the study	77
Table (11):	Hematologic toxicity of patients in the study	79
Table (12):	Non-hematologic toxicity of patients in the study	80

List of Tables

Table No.	Title	Page No.
Table (13):	Comparing between Grades of toxicity before and After pharmacists' intervention for Anemia	81
Table (14):	Comparing between Grades of toxicity before and After pharmacists' intervention for Thrombocytopenia	82
Table (15):	Comparing between Grades of toxicity before and After pharmacists' intervention for Liver Enzymes	83
Table (16):	Comparing between Grades of toxicity before and After pharmacists' intervention for Nausea and Vomiting	84
Table (17):	Comparing between Grades of toxicity before and After pharmacists' intervention for Mucositis	85
Table (18):	Comparing between Grades of toxicity before and After pharmacists' intervention for Paresthesia	86
Table (19):	Comparing between Grades of toxicity before and After pharmacists' intervention for Alopecia	87
Table (20):	Comparison of functional scales scores of patients In the study before and after pharmacist's intervention	89
Table (21):	Comparison of symptom scales scores of patients in the Study before and after pharmacists' intervention	90

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Molecular mutations in breast cancer.....	9
Figure (2):	Emerging targetable pathways in breast cancer	34
Figure (3):	The study procedures and phases	54
Figure (4):	The patient information form	59
Figure (5):	The EORTC-QLQ-C23 English version 1.....	65
Figure (6):	The EORTC-QLQ-C23 Arabic version 1.0	66
Figure (7):	The percentage of patients suffered from different types of Drug-Drug interactions of patients in the study	76
Figure (8):	Pie chart representing the percentage of patients suffered from Different types of Food-Drug interactions of patients in the study	78
Figure (9):	Change of Mean of Functional Scale scores of patients Participated in the study before and after pharmacists' intervention	91
Figure (10):	Change of Mean Symptom Scale scores of patients Participated in the study before and after pharmacists' intervention	92

List of Abbreviations

Abb.	Meaning
FEC	5-Flurouracil, epirubicin, cyclophosphamide
ACS	AMERICAN CANCER SOCIETY
ACCP	American college of clinical pharmacy
ANC	Anisocyte normal count
BC	Breast Cancer
DCIS	Ductal Carcinoma In Situ
ECOG	Eastern cooperation oncology group
EORTC	European organization for research and treatment of cancer
QLQ-C23	quality of life questionnaire C23
FNAC	Fine needle aspiration and cytology
HRQOL	Health related quality of life
LCIS	Lobular carcinoma in situ
MBC	Metastatic Breast Cancer
NCI	National Cancer Institute

List of Abbreviations

Abb.	Meaning
NCI-CTCAE	National Cancer Institute Common Terminology Criteria For Adverse Events
OPs	Oncology pharmacist specialists
QOL	Quality of Life
SD	Stable Disease
SD	Standard Deviation
TDM	Therapeutic Drug Monitoring
WBC	White blood cells
WHO	World Health Organization

Abstract

Abstract

Background and Objectives: Breast cancer is the most common cancers among women in Egypt. According to the National Cancer Institute at Cairo University (NCI), 31.5% of their cancer cases are breast cancer. Health Related Quality of Life and reduction of side effects are considered important goals in the treatment of cancer patients. The aim of this study was to assess the impact of clinical pharmacist's intervention on the improvement of clinical outcomes of patient with breast cancer.

Patients and Methods: The study was carried out on a group of 60 breast cancer women who were subjected to a thorough history taking, clinical pharmacist's intervention using patient education and counseling tools, medication therapy management and assessment of treatment related adverse events prior to each cycle and at the end of the treatment. In addition, assessment of quality of life (QOL) was done at the base line and at the end of treatment to evaluate the effect of the pharmacist's interventions.

Results: The current study has shown that the clinical pharmacist interventions were associated with significant reduction in toxicity grades of patients e.g anaemia where the percentage of patients of grade 2 decreased from (17%) to (1.7%), while patients having neutropenia grade 4 decreased from (10%) to (0%), moreover (5%) of patients had grade 4 nausea/vomiting, while after pharmacist intervention became (0%). Regarding patients' quality of life, results showed improvement of mean \pm SD of most of the QOL scales such as body image from (25.3 \pm 20.2) to (61.6 \pm 16.8), systematic therapy side effects decreased from (80.8 \pm 19.53) to (42.8 \pm 16.8), breast symptoms decreased from (79.9 \pm 18.6) to (49.8 \pm 82.4), all with (p<0.001).

Conclusion: Most treatments of breast cancer although being beneficial also result in toxicities, primarily anemia, neutropenia, nausea and pain. These side-effects adversely impact the patient QOL and can lead to treatment discontinuation. Clinical pharmacist intervention resulted in beneficial clinical outcomes in patients with breast cancer such as the reduction of treatment related side effects and the improvement of patients QOL.

Key words: Breast cancer - Clinical Pharmacist's Interventions – Toxicity grades- Quality of Life.

Introduction

Introduction

Breast cancer is one of the most common malignancies in females worldwide and is curable in 70 to 80% of female patients with early-stage, non metastatic disease. Advanced breast cancer spread to distant organs is considered incurable using currently available treatments. **(Bray, F. et al, 2018).**

Breast malignancy could be a heterogeneous disease where molecular characteristics include activation of human epidermal factor growth receptor 2 (HER2) encoded by ERBB2, also activation of hormone receptors as estrogen receptor and progesterone receptor and/or BRCA mutations. Treatment strategies differ in keeping with molecular subtype. **(Wong, F. Y. et al, 2018).**

Management of breast malignancy is multidisciplinary, locoregional as surgery and radiation treatment also systemic treatment approaches. Systemic therapies include endocrine therapy for hormone receptor-positive disease, chemotherapy, anti-HER2 therapy for HER2-positive disease, bone stabilizing agents, poly (ADP-ribose) polymerase inhibitors for BRCA mutation carriers and, quite recently, immunotherapy. **(Cardos F. et al, 2017).**

Global challenge in the breast cancer field is to ensure that all women have access to high-quality standard diagnosis through imaging and pathology and therapy like surgery, radiation and systemic therapy, avoid late diagnosis and also provided with adequate supportive and palliative care services **(Ginsburg, O. et al, 2017).**

Absolutely desirable, cancer survivors requires the maintenance of care that could be systematically included in the follow-up sessions, unfortunately survivors are at risk of malignancy recurrence and/or second malignant neoplasm due to cancer therapy, late side effects, and/or co-morbidities arising from therapies like cardiac, pulmonary problems and fatigue, also depression and post-traumatic stress disorder **(Mariotto, A. B. et al, 2017).**

In addition, educational and multidisciplinary support is important to understand the illness process, overcome adversities could be economic or social or familial and serve demands for self-care at all stages, from diagnosis to follow-up in either chronic or disease-free conditions. **(Kohler, B. A. et al , 2015).**

Systematically designed, implemented and evaluated programs are important for all the kinds of populations, through making associations with information about all stages of malignancy starting from early detection, diagnosis, therapy, survival, progression till end of life also decision-making skills and self-management, with consequent improvements in quality of life and the achievement of well-being. **(Torre, L. A et al, 2016).**

Quality of life has become a well-accepted outcome measure for breast cancer patients and an integral part of malignancy management due to the increase of number of breast cancer patients, as each year there is over 1.1 million newly diagnosed females with breast cancer worldwide and 410,000 females die from the disease .On the other hand, improvements in early detection and treatment of breast malignancy have led to longer survival of these patients. **(Grimison P et al 2007).**

Quality of life is one of the main determinants of treatment success in modern oncology. Quality of life related to health considered as an important parameter in clinical cancer trials. It has been shown that quality of life assessment in cancer patients to help improve therapy and may even be one of prognostic factors. **(Quinten C et al, 2009).**