



## Concurrent Weekly Paclitaxel with Postoperative Radiotherapy in the Adjuvant Treatment of Node- Positive HER2 Negative Breast Cancer

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**Abstract: Background:** Breast cancer is the foremost oncologic problem, contributing 20% of all cancers and 43% of female cancers. Phase II research of concurrent radiation (RT) and paclitaxel in node-positive breast cancer demonstrated a 5-year actuarial disease-free survival rate of 88% and an overall survival rate of 93% with no local failures and tolerable tolerability. **Aim of the work:** This work aimed to assess the safety and efficacy of the use of concurrent weekly paclitaxel with postoperative radiation therapy in the adjuvant treatment of node-positive, hormonal receptor positive (HR +ve), HER2 -VE breast cancer patients who underwent breast conservative surgery. **Patients and Methods:** This prospective, single-arm study was implemented at Clinical Oncology Department, Tanta University Hospitals within the time frame from October 2017 to January 2019 and involved 75 women identified with stage IIB or III, node-positive HR +ve HER2 -ve, invasive breast cancer. Patients underwent breast conservative surgery including either a quadrantectomy or lumpectomy and received adjuvant chemotherapy included four cycles of doxorubicin (60 mg/m<sup>2</sup>) or epirubicin 100mg/m<sup>2</sup> and cyclophosphamide (600 mg/m<sup>2</sup>) I.V every 21days preceded by 12 weeks of paclitaxel (80 mg/m<sup>2</sup>) I.V around 1 hour, using real body weight to determine surface area. 3D conformal RT was delivered concurrently with weekly paclitaxel, starting w1 of paclitaxel with day 1 of RT at a dose of 5000 cGy over 25 fractions with boost dose to tumor bed of 1000 cGy over 5 fractions. **Results:** There were no local recurrence occurred during at least 2-years of follow up (100% local control), while 6.66% (5 /75) of our patients developed distant metastasis during follow up period (2-years DFS was 93.33%). Regarding hematological toxicity, 30.66% (23/75) of our patients developed grade 1 or 2 anemia during the course of treatment, and 8% (6/75) of patients developed grade 3 anemia. None of the cases showed symptoms of pneumonitis or developed localized fibrosis during follow up. Normal cardiac functions throughout treatment and during follow up. **Conclusions:** The concomitant chemoradiation with Paclitaxel weekly as adjuvant therapy for breast cancer, is a promising regimen for patients with hormonal receptor +ve, HER2 neu -vebreast cancer. [Sally Hamed Mahmoud Mashaal, Mohamed Ali Mlees, Amro Abd El-Aziz Ghannam, Hanan Shawky Mahmoud, Hesham Ahmed Tawfik **Concurrent Weekly Paclitaxel with Postoperative Radiotherapy in the Adjuvant Treatment of Node- Positive HER2 Negative Breast Cancer** Cancer Biology 2022;12(2):6-15]. ISSN: 2150-1041 (print); ISSN: 2150-105X (online). <http://www.cancerbio.net> 2. doi:[10.7537/marscbj120222.02](https://doi.org/10.7537/marscbj120222.02)

**Keywords:** Weekly Paclitaxel, Radiotherapy, Node- Positive, Breast Cancer

### 1. Introduction:

A growing proportion of females are now treated well with breast-conserving treatment, since local therapeutic choices have altered considerably during the past several decades. Despite the fact that treatment methods differ geographically, research indicate that in certain scenarios, over 70% of women diagnosed with breast cancer opt for conservation of breast<sup>(1)</sup>.

Chemotherapy and radiotherapy (RT) have clearly entrenched significance in early-stage and high-risk breast cancer therapy. Regarding the order

of these treatment elements, however, some retrospective analyses of older chemotherapeutic protocols have demonstrated greater risks of local repetition when adjuvant chemotherapy is administered prior RT<sup>(2)</sup>, while others have observed no elevated incidence<sup>(3,4)</sup>.

Anthracyclines and taxanes form the foundation of the majority of contemporary breast cancer chemotherapy protocols. The anthracycline-based concurrent chemoradiation treatment (CCRT) has been linked to severe cardiac and cutaneous damage<sup>(5)</sup>. The use of taxanes and whole breast irradiation

(WBI) simultaneously appears viable. Mitotic inhibitors, taxanes stabilise microtubules by stimulating their assembly and blocking their depolymerization<sup>(6)</sup>. Taxanes stop the cell cycle in the G2/M phase, which is thought to be the most radiosensitive phase<sup>(7)</sup>.

Developmental changes with concomitant chemoradiation for cancer breast were assessed in cyclophosphamide/methotrexate/5-fluorouracil (CMF)-guided chemotherapy protocols a decreased dosage of 39.6 Gy was administered to the entire breast utilizing megavoltage tangential fields 22 fractions of 1.8 Gy, accompanied by a boost dose of 16 Gy administered in 8 fractions of 2 Gy to the lumpectomy region. A median follow-up of 94 months demonstrated a tolerable incidence of locally toxic and a rate of local recurrence of 4 %<sup>(5)</sup> Phase II study of RT concurrent with paclitaxel in node positive breast cancer showed the 5-year actuarial disease-free survival rate is 88%, and the overall survival rate is 93%, with no local failures and tolerable toxicity<sup>(8)</sup>. The aim of this work was to assess the safety and efficacy of the use of concurrent weekly paclitaxel with postoperative radiation therapy In adjuvant therapy for node-positive, HER2 -VE cases with breast cancer underwent breast conservative surgery.

## 2. Patients and Methods:

In a phase II, prospective, single-arm study, we included 75 female afflicted with Stage IIB or III, pathologically proven invasive, nodal-positive breast cancer from October 2017 through January 2019 presented to Clinical Oncology Department, Faculty of Medicine, Tanta University. The date of this analysis was April, 2021.

### Ethical considerations:

- The Institutional Review Board (IRB) –Tanta Faculty of Medicine has authorised the study procedure (Approval Code: 31846/10/17).
- Administrative approval and official permissions were obtained before information collecting.
- Patients enrolled in the study gave their informed permission after receiving assurances of data confidentiality.

The study included patients with HR +ve and HER2 -ve, node positive stage IIB or III invasive BC patients had breast conservation surgery (BCS) consisting of either (a lumpectomy or quadrantectomy in conjunction with an ipsilateral axillary dissection). Age of patients ranged from 18 years to less than 70 years with ECOG performance status  $\leq 2$ , Normal

cardiac function can be expressed as echocardiogram-determined left ventricular ejection fraction of at least 55 %, normal hematopoietic, liver, and kidney functions.

HR -ve and/or HER2 +ve patients. Patients with radiological or observable signs of distant metastases. Prior RT for breast cancer. The surgical procedure of modified radical mastectomy. Pregnant or lactating women. Bilateral invasive breast cancer. Patients with significant medical or mental disease are excluded as well. Pre-existing G2 motor or sensory neurotoxicity according to (CTCAE V4(4.03))<sup>(9)</sup>.

### All patients in this study were subjected to the following:

Clinical examination (Complete general and local examination to assess peripheral neuropathy, chest condition, local recurrence, lymphedema, rated according to RTOG criteria for acute skin toxicity)<sup>(10)</sup>, Cosmetic results were evaluated using Harvard scale (4-point Likert scale) of breast cosmeses<sup>(11)</sup>. Routine laboratory and radiological investigations, any abnormality was graded according to Common Terminology Criteria for Adverse Events (V4.0 CTCAE V4(4.03))<sup>(9)</sup>.

As first treatment, all patients received breast conserving surgery consisting of a lumpectomy, quadrantectomy, and ipsilateral axillary dissection. Margin clearance was assured.

### Chemotherapy:

Adjuvant chemotherapy comprised of four cycles of doxorubicin (60 mg/m<sup>2</sup>) or epirubicin 100mg/m<sup>2</sup> and cyclophosphamide (600 mg/m<sup>2</sup>) administered I.V every 21days preceded by 12 weeks of paclitaxel (80 mg/m<sup>2</sup>) I.V over 1 h, with real body weight used to compute surface area.

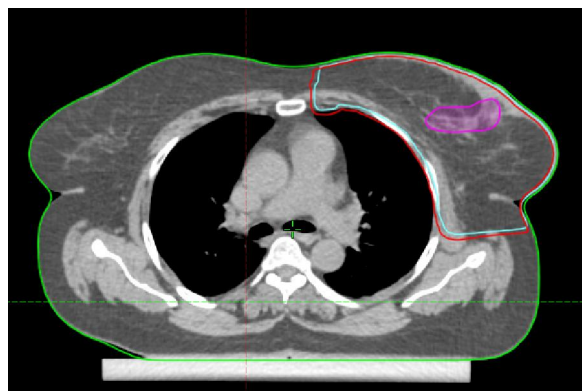
Dose adjustment of chemotherapy: Full biweekly doses of our regimen were given when the absolute granulocyte count (AGC) was  $> 1,000$  cells/ $\mu$ l, platelets were  $> 100,000$  cells/ $\mu$ l, and non-hematologic toxicities were  $\leq$  grade 2. If the AGC was 500 – 1,000 cells/ $\mu$ l or the platelet count was 50,000 - 100,000 cells/ $\mu$ l, the chemotherapy regimen dose was decreased by 25%. The regimen dose was decreased by 50% for grade 3 non-hematologic toxic effects. If the AGC was  $< 500$  cells/ $\mu$ l, the platelet count was  $< 50,000$  cells/ $\mu$ l and/or the non-hematologic toxic effects was grade 4, the chemotherapy regimen dose was withheld, and the patient was reevaluated at the subsequent week.

**RT:**

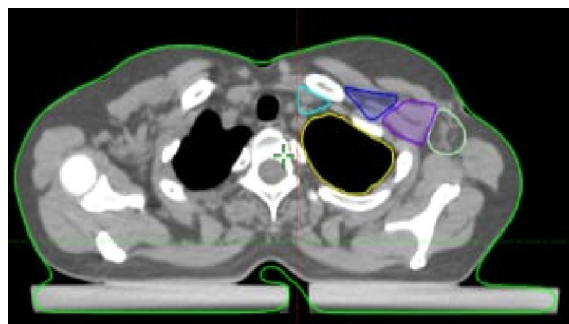
3D conformal RT was delivered concurrently with weekly paclitaxel, starting w1 of paclitaxel with day 1 of RT at a dose of 5000 cGy over 25 fractions with boost dose to tumor bed of 1000 cGy over 5 fractions.

**Radiation techniques:**

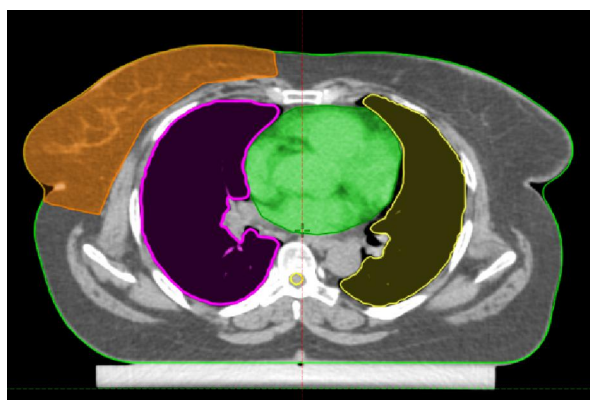
Preparation as physiotherapy in case of limited shoulder abduction, Immobilization and simulation all patients were scanned in supine position on breast board with both arms above the head and patient head in neutral position and face tilted to contra lateral side. Laser beam was used to define the reference points marked with "radiopaque markers" for reproducibility of the treatment position. CT slices at 3 mm thickness were taken from the chin to the upper abdomen. All incisions were then transmitted to the treatment planning system and the target volume and organs at risk delineation was performed. Clinical target volume and planning target volume were developed and specified for radiation treatment planning in accordance with the RTOG<sup>(12)</sup> breast cancer atlas. In addition, OARs such as heart, both lungs, spinal cord, contralateral breast (CB), and thyroid gland were described.



**Figure 1:** Left breast Contouring of target volumes CTV (cyan), PTV (red), and boost target volume (magenta contour).



**Figure 2:** left breast Contouring of regional lymphnodes sprawl nodes (cyan), level I axillary lymph nodes (yellow), level II axillary lymph nodes (purple) and level III axillary lymph nodes (blue).



**Figure 3:** Contouring of critical organs—contralateral breast (orange contour) —ipsilateral lung (yellow contour) —contralateral lung (magenta contour) and heart (green)

**Hormonal treatment:**

After chemotherapy and RT, patients received adjuvant hormonal treatment in the form of anti-estrogens or aromatase inhibitors with or without ovarian function suppression.

**Patient monitoring:**

Medical history, physical examination, standard laboratory testing, breast ultrasound, mammography and/or MRI, belly and pelvic ultrasound, CT-scan of the chest, abdomen, and pelvis, bone scan, and CA15.3 measurement included pre- and on-treatment monitoring. Histologic proof of cancer breast with evaluation of ER, PR, HER2 neu and Ki67 was necessary in every patient prior to therapy.

**Assessment of Toxicity;**

Throughout therapy, patients were assessed utilizing a guided medical history and physical assessment. The incidence and kind of negative occurrences were documented. Acute toxicity was graded according to the (CTCAE V4(4.03))<sup>(9)</sup>. Skin toxicity was evaluated by RTOG criteria<sup>(10)</sup>. Evaluation of late toxicity associated to therapy was conducted using the grading system for late normal tissue effects (LENT)<sup>(13)</sup>.

**Statistical analysis**

The acquired data were arranged, tabulated, and statistically analysed using version 21 of the SPSS software statistical computer programme. When applicable, qualitative variables were given as frequency and percentage (%) and analysed using the Chi-square test or Fisher's exact test. For multivariate analysis, the Kaplan-Meier technique and the Cox proportional hazards model were utilised. A two-tailed P value less than or equal to 0.05 was deemed statistically significant.

**3. Results:**

Seventy-five patients were included in this study, their ages ranged from 35 to 66 with a mean of 52.17 and standard deviation of  $\pm 10.76$ . As regard performance status, most of our patients 76 % (57/75) had performance status zero, while 24 % (18/75) of patients had performance status I. Most of our patients 60% (45/75) were postmenopausal while 40% (30/75) were premenopausal. Right sided tumors represented 30.6% (23/75), while left sided tumors represented 69.3% (52/75). Four percent of patients (3/75) had T1 tumors, 88% (66/75) of our patients had T2 tumors, and the remaining 8% (6/75) of patients had T3 tumors. As regard LN status 41.3% (31/75) of patients showed N1 stage, while 58.7% (44/75) showed N2 stage. Fourteen patients (18.66%) showed lympho-vascular invasion of the tumor. As regard hormonal receptors status all patients were estrogen receptor positive (ER), 88% (66/75) of patients were progesterone receptor (PR) positive, while 12% (9/75) of patients were PR negative. As regard KI67 48% (36/75) of patients showed KI67 negative disease while the remaining 52% (39/75) patients were KI67 positive (table 1).

**Table (1):** Patient and tumor characteristics

Characteristics		N of patients (range or percent)
Mean age:		52.17 $\pm$ 10.76
Performance status	0	57 (76%)
	1	18 (24%)
Menstrual status	postmenopausal	45(60%)
	premenopausal	30(40%)
Side:	Right	23 (30.66%)
	left	52 (69.33)
T stage:	1	3 (4%)
	2	66 (88%)
	3	6 (8%)
N stage:	1	31 (41.3%)
	2	44 (58.7%)
	3	0 (0.0%)
Lympho-vascular invasion:	Negative	61 (81.33%)
	Positive	14 (18.66%)
Estrogen receptors	Positive	75 (100%)
	Negative	0
Progesterone receptors	Positive	66 (88%)
	Negative	9 (12%)
Ki 67:	Negative <14%	36 (48%)
	Positive $\geq$ 14%	39 (52%)

Data represented as frequency and (%), mean  $\pm$  SD.

Acute chemotherapy toxicity was graded according to the (CTCAE V4(4.03)), while acute radiation toxicity was graded according to RTOG acute skin toxicity criteria. Anemia was the most common grade 3–4 hematologic toxicity, recorded in 8% (6/75) of patients. In this study, grade 3–4 neutropenia was recorded in 4% (3/75) of patients, however, infection related death was not recorded, and no one died with grade 3 or 4 neutropenia due to infection. Most of non-hematological toxicities were mild and manageable. Sensory neuropathy, a common paclitaxel side effect, was one of the most common treatment-related adverse events, affecting 70.66% (53/75) of cases. Most cases of neuropathy were mild to moderate in severity. 4 % (3/75) of individuals experienced grade 3/4 sensory neuropathy. Nausea, a frequent side effect of chemotherapy, was recorded in 10.66% (8/75) of patients. The nausea was only mild to moderate. Diarrhea was experienced by 8% (6/75)

of patients with only 2.66% (2/75) of patients suffered from grade 3 toxicity. As regard acute skin toxicity, 54.66% (41/75) of patients developed erythema during concurrent chemo-radiation (grade1), while 40% (30/75) of patients developed dry desquamation and only 4% (3/75) of patients developed scattered small areas of moist desquamation (grade2), while 1.33% (1/75) of patients developed extensive moist desquamation (grade3). None of the cases showed symptoms of pneumonitis during treatment or follow up period. As regard cardiac toxicity all cases showed normal ranges of ejection fraction throughout treatment time and follow up period. A total 6.66% (5/75) of patients required hospitalization, as follows: neutropenic fever in 2, bleeding in 1, infection in 1, and severe diarrhea in 1. Chemotherapy or concurrent chemo-radiation was interrupted for up to 2 weeks in case of greater than grade 3 adverse reactions (table 2).

**Table (2):** Acute hematological and non- hematological toxicity in 75 patients with breast cancer:

Non- hematological toxicity	Total	G (1&2)	G (3&4)
	N (%)	N (%)	N (%)
Diarrhea	6 (8%)	4 (5.33%)	2 (2.66%)
Nausea/ vomiting	8 (10.66%)	8 (10.66%)	0 (0%)
skin toxicity	75 (100%)	74 (98.66%)	1 (1.33%)
Sensory neuropathy	53 (70.66%)	49 (65.33%)	3 (4%)
Lethargy	15 (20%)	15(20%)	0 (0%)
Cardiotoxicity	0 (0%)	0 (0%)	0 (0%)
Alopecia	75 (100%)	75 (100%)	-
<b>Pulmonary toxicity:</b>			
3 months after chemoradiation	0 (0%)	0 (0%)	0 (0%)
6 months after chemoradiation	0(0%)	0 (0%)	0 (0%)
<b>Hematological toxicity</b>			
Anemia	29 (38.66%)	23 (30.66%)	6 (8%)
Neutropenia	18 (24%)	15 (20%)	3 (4%)
Thrombocytopenia	10 (13.33%)	7 (9.33%)	3 (4%)

Data presented as frequency and percent



Late events after therapy were evaluated and summarized in table 3. According to the LENT grading system, evaluation of late treatment-related toxicity was conducted. During >2 years of follow-up concurrent chemo-radiation produced grade1 lymphoedema in 20% (15/75) of our patients, as well as chronic skin toxicity in 7 of these patients. Chronic skin toxicity was in the form of chronic pigmentation in 8% (6/75) of patients and telangectasia in only 1.33% (1/75) of patients, none of these patients developed localized fibrosis. As regard cardiac toxicity all patients continued to show normal values of ejection fraction with no cardiac events. Hypothyroidism was experienced by 6 patients (8%) (table 3).

**Table (3):** Late events after therapy

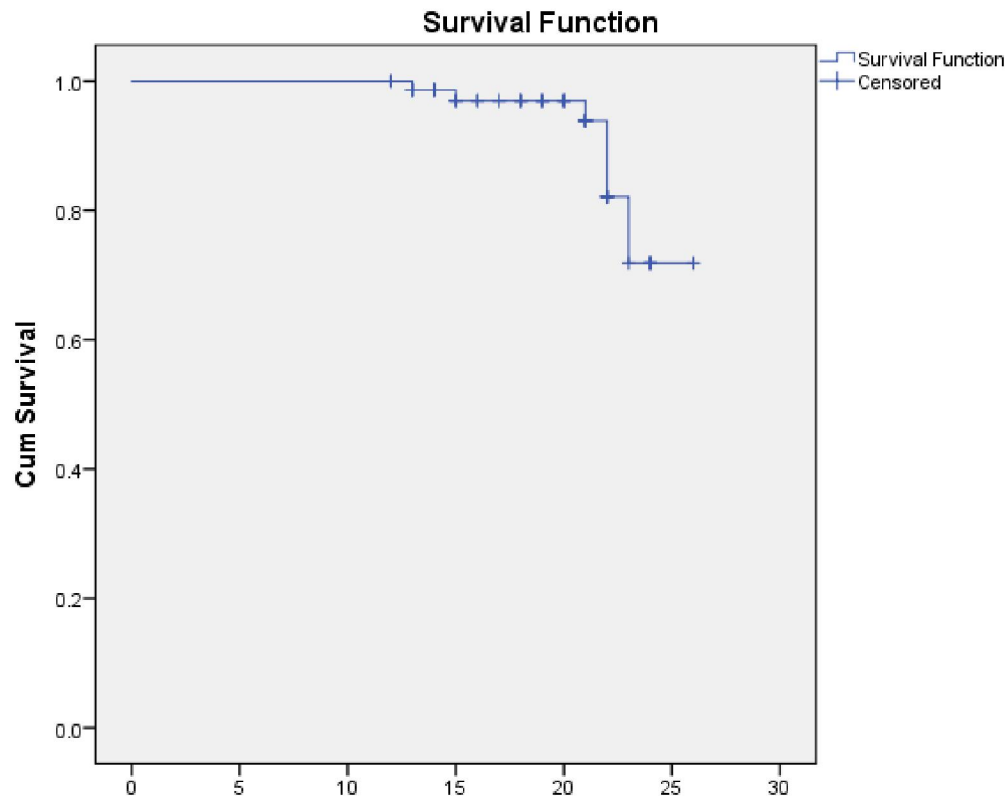
Event	No.
<b>Lymphoedema</b>	15 (20%)
<b>Cardiotoxicity</b>	
• Grade 2	0
• Grade 3	0
• Grade 4	0
Hypothyroidism	6 (8%)
<b>Chronic skin toxicity</b>	
• Pigmentation	6 (8%)
• Telangectasia	1 (1.33%)

The overall and the final cosmetic results were acceptable by most of the patients and treating physicians team. Only 6.66% (5/75) of patients accepted appearance moderately (table 4).

**Table (4):** Harvard scale (4-point Likert scale) of Breast Cosmeses

Item	Description	No	%
<b>Excellent</b>	Treated breast almost identical to untreated breast	45	60
<b>Good</b>	Minimal difference between treated breast and untreated breast	25	33.33
<b>Fair</b>	Treated breast clearly different from untreated breast but not seriously distorted.	5	6.66
<b>Poor</b>	Major functional and esthetic sequelae in treated breast	0	0

No local recurrence occurred during at least 2 years of follow up, while only 5 patients (6.66%) developed metastasis (1 patient developed lung metastasis, 1 patient liver metastasis, 1 patient brain metastasis and 2 patients had bone metastasis) during follow up. Two-year DFS was 93.33%, while the 2-year overall survival was 100% (figure 3).



**Figure 4:** Disease free survival for all patients

#### 4. Discussion:

Eliminating local recurrence provides immense mental and physical advantages for the patient, such as preventing the need for other surgery. The reported decrease in the incidence of local and regional recurrence in individuals treated with radiation therapy and conservative surgery is especially significant given the 2011 Early Breast Cancer Trialists' Collaborative Group findings (EBCTCG)<sup>(14)</sup>.

Numerous retrospective studies have demonstrated that lengthy delays between surgery and the commencement of RT are linked with increased local recurrence risks<sup>(15)</sup>, some believe that deferring treatment in favour of radiation may raise the chance of remote metastasis and, eventually, diminish survival<sup>(16)</sup>.

Buchholz et al.<sup>(17)</sup> revealed the the results for patients who got surgery and adjuvant radiation therapy. A radiation delay of more than six months following surgery correlated with decreased local control and overall survival.

The National Surgical Adjuvant Breast and Bowel Project B-28 Phase III study conducted for 5 years and involved 1,531 individuals with breast cancer that has metastasized to lymph nodes reported that two deaths among patients who got AC plus paclitaxel (PTX) could not be ruled out as a result of the therapy (coronary artery disease in one patient and pulmonary embolism in one patient). 15 % had neurosensory toxicity of grade 3 or higher with PTX therapy (based on the highest toxicity grade recorded throughout PTX cycles), followed by granulocytopenia (3 %) and febrile neutropenia (3 %). The incidence of cardiac dysfunction of grade 3 or higher during or after treatment was 0.9%. Five-year local recurrence, disease-free survival, and overall survival were 4.7%, 76%  $\pm$  2%, and 85%  $\pm$  2% respectively<sup>(18)</sup>.

Several studies have demonstrated positive results of concomitant chemoradiation in treatment of breast cancer as SECRA study<sup>(19)</sup> which comparing concurrent to sequential chemo-RT, and enrolled

patients with invasive, breast cancer at an early stage. RT was provided concurrently with chemotherapy between cycles two and three for CMF or cycles five and six for anthracycline-CMF. Similar results were seen for the loco-regional in-field recurrence rates: 2.7 percent (95% CI: 1.9–3.9) in the synchronous arm and 5.1 % (95 % CI: 3.9–6.6) in the sequential arm.

ARCOSEIN<sup>(20)</sup> trial in which patients received chemotherapy followed by RT or concurrent CCRT, showed statistically significant increase in 5-year LRFS in the concurrent arm.

Due to their radiation-sensitizing qualities, taxanes could be a superior candidate for concurrent treatment. In the treatment of other malignancies, such as lung cancer, the benefits of concurrent chemoradiation and paclitaxel are well recognised<sup>(21)</sup>.

Our results are better than that reported by Hassan et al.<sup>(22)</sup>, who studied forty-three women with stage II or III breast cancer following definitive surgery (modified radical mastectomy or breast conservative surgery). Adjuvant chemotherapy administered was 4 cycles AC (Doxorubicin 60mg/m<sup>2</sup> + cyclophosphamide 600mg/m<sup>2</sup>) accompanied by 4 cycles of Paclitaxel 60mg/m<sup>2</sup> weekly for 12 weeks in conjunction with 3D Conformal RT at a dosage of 5000 cGy/20Fx during 4 weeks to the entire breast and supraclavicular nodal region also our results were better than that obtained by Chen et al.<sup>(8)</sup>

Our findings according to hematological toxicity and non hematological toxicity are better than the results from a study by Algizawy et al.,<sup>(23)</sup> who studied 62 patients with LABC who received either a primary mastectomy or neoadjuvant chemotherapy with Fluorouracil, epirubicin, and cyclophosphamide (FEC) followed by a mastectomy. Weekly I.V docetaxel (30 mg/m<sup>2</sup>) was administered over a period of 9 weeks, and RT at a total dosage of 5000 cGy was administered in 25 portions over a period of 5 weeks. The median duration of patient follow-up is 32 months (range: 12–63) and reported anemia in (38.7%) with grade 3 and 4 representing (9.7%), Neutropenia in (33.9%) of cases with grade 3 and 4 in (11.3%), Thrombocytopenia in (17.7%) with grade 3 and 4 in (4.8%), diarrhea in (9.7%), neuropathy grade 3 and 4 in (4.8%).

In our study none of the cases showed symptoms of pneumonitis, this was in conformity with the findings obtained by Chen et al.,<sup>(8)</sup> and Hassan et al.,<sup>(22)</sup>, who reported no cases of symptomatic radiation pneumonitis.

Our results were inconsistent with results from Burstein et al.,<sup>(24)</sup> who studied sixteen individuals with operable breast cancer Stages II or III after

definitive surgery and received concurrent paclitaxel and RT. RT dose ranged from 3960–4500 cGy / 180 cGy daily fraction +/- boost (electrons) 1000–1600 cGy. Paclitaxel was given weekly x 12 weeks (60 mg/m<sup>2</sup>) 3 of 7 patients developed grade 3 pneumonitis, ineffective efforts to eliminate this toxicity in conjunction with weekly paclitaxel by treatment timing and CT-based RT simulation was reported. This discrepancy may be attributed to the conformal RT methods' superior dosage uniformity in our investigation. In addition, none of our patients underwent axillary irradiation separately.

Also, inconsistent with results from Hanna et al.,<sup>(25)</sup> who studied 20 patients with breast cancer received concurrent adjuvant radiation and paclitaxel after definitive surgery. Prior to RT and paclitaxel, each patient was administered a doxorubicin-containing combination. RT was administered simultaneously with paclitaxel after all doxorubicin therapy was completed (at a dose of 5040 cGy / 180-200 cGy daily fraction), with each patient having at least two paclitaxel cycles (175 mg/m<sup>2</sup>) per three weeks throughout RT and reported radiation pneumonitis in 20% of cases. Our results were better than that of Chen et al.<sup>(8)</sup> who reported 77% grade 1 skin toxicity, 16.7% grade 2 and only 5.6% developed grade 3 toxicity.

Also our results were inconsistent with results of Bellon et al.,<sup>(26)</sup> who studied concurrent CCRT after breast surgery in node positive patients using paclitaxel 175 mg/m<sup>2</sup> every 21 days and RT in doses beginning with 4680 cGy to 5040 cGy and also reported high incidence of grade 3 skin toxicity 10% with subsequent interruption of treatment.

Final cosmetic results at 2 years of follow up were acceptable by most of the patients and treating physicians team with excellent, good, and fair cosmetic results in 60% (45/75), 33.33% (25 /75), and 6.66% (5/75) of patients respectively, better than the results obtained by Hassan et al.,<sup>(22)</sup> who reported excellent, good, fair and poor scores in 62.5%, 20%, 10% and 7.5% respectively after a median of 36 months of follow-up. In agreement of our results Chen et al.,<sup>(8)</sup> who reported moderately accepted cosmetic results in 16 % of cases and Bellon et al.,<sup>(26)</sup> who reported chronic skin toxicity in only 1 patient.

The cardiac functions showed normal values throughout treatment and during follow up, in contrast to the results obtained by Rouesse et al.,<sup>(27)</sup> who reported decreased EF below normal in 6% of patients after concurrent CCRT but was transient and returned back to normal range, this difference in cardiac



toxicity can be explained by different chemotherapy used and different radiation dose from our study.

#### Limitation of the study:

Small sample size, many questions remain unanswered regarding the applications of this regimen to other types of breast cancer with Her2 neu positive tumors and TNBC subtypes and the optimal combination of RT and chemotherapy.

#### Conclusions:

This study demonstrated that concomitant chemoradiation with weekly paclitaxel in adjuvant treatment of breast cancer, is a promising regimen for patients with Her2 neu -ve, hormonal receptors +ve breast cancer.

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**Conflict of Interest:** Nil

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