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Pathological complete response and associated factors in breast cancer after neoadjuvant chemotherapy: A retrospective study

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ABSTRACT

Objective: This study aimed to determine clinical and pathological factors that identify a pathological complete response (pCR) in breast cancer patients undergoing neoadjuvant chemotherapy (NAC).

Material and Methods: A retrospective, single-center study was conducted in women over the age of 18 who had been diagnosed with pathologically confirmed invasive breast cancer and who had received NAC between July 2016 and October 2021. Patient demographics, clinical, radiological, treatment, and pathological data were reviewed from the electronic hospital records. The primary outcome of interest was pCR, defined as the absence of residual invasive breast cancer in both the breast and axillary lymph nodes. Multivariable logistic regression analysis was used to identify factors associated with pCR.

Results: A total of 119 patients were included in the analysis. The distribution of age was 54.5 ± 11.5 years. pCR was observed in 33 (27.7%) patients. pCR for breast tissue was observed in 43 (36.1%) patients. There was no statistically significant relation between the clinical stage and pCR. Age, age at first labor, extent of disease in the breast, NAC completeness, clinical tumor size (cT) stage, clinical lymph node (cN) stage, and molecular subtype were analyzed in a multivariable model. Analysis showed that molecular subtype was the only independent factor related to pCR. pCR rates across molecular subtypes were: 8.7% in luminal-A, 10.8% in luminal-B, 54.5% in human epidermal growth factor receptor 2 (HER-2)-positive, 42.4% in luminal-B (HER-2 positive) and 46.7% in triple-negative. There was no statistically significant difference between luminal-A and luminal-B subgroups (odds ratio 1.15, 95% confidence interval, 0.19-9.35, p= 0.881). Despite the limited number of patients in HER2-positive and triple-negative groups, both demonstrated statistically significant higher odds compared to reference group.

Conclusion: The presented study underscores the relevance of molecular subtypes in determining the response to neoadjuvant chemotherapy in breast cancer patients. Particularly HER2-positive and triple-negative subtypes may demonstrate more favorable response rates.

Keywords: Breast cancer, neoadjuvant chemotherapy, pathological complete response, molecular subtypes

INTRODUCTION

Several treatment options including chemotherapy, hormone therapy, radiation therapy, and surgery are used in the treatment of breast cancer (1,2). However, the efficacy of these treatments can vary significantly from patient to patient, highlighting the necessity for personalized treatment strategies. Important variables such as age, genetic composition, and individual characteristics are critical to the treatment's success (3-5). Modern treatment regimens may include a combination of several treatment strategies (6). By considering these individual factors, healthcare professionals work to create treatment plans that are customized to meet the specific needs of each patient. Such personalized approaches are crucial in improving the survival rates of breast cancer patients (7).

Several parameters need to be evaluated during the initial treatment planning phase (8). In recent years, tumor molecular subtypes have emerged as one of the most extensively researched factors in this regard. Molecular subtyping provides valuable insights into the heterogeneity of breast cancer, enabling healthcare professionals to better understand the underlying biology and tailor treatment strategies accordingly. By categorizing breast cancer into distinct molecular subtypes, such as luminal A, luminal B, human epidermal growth factor receptor 2 (HER2)-positive tumors, and triple-negative breast cancer (TNBC), clinicians can identify specific characteristics and response patterns to different therapies (5,8,9).

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This information aids in the selection of appropriate treatment modalities based on the molecular profile of the tumor.

The aim of the study was to evaluate the clinical and pathological factors contributing to achieving a pathological complete response (pCR) for breast cancer patients who received neoadjuvant chemotherapy (NAC). By doing this, the research aimed at increasing our understanding of the underlying factors, which might significantly improve our ability to predict which patients would benefit from NAC the most.

MATERIAL and METHODS

The study was designed as a single-center, observational study and included the retrospective analysis of all female patients over the age of 18 diagnosed with invasive breast cancer that was pathologically confirmed and who received NAC between July 2016 and October 2021 at Karadeniz Technical University, Faculty of Medicine, Farabi Hospital.

The study was approved by the ethics committee of the university. Exclusion criteria were defined as metastatic disease at the time of diagnosis, previous treatment for breast cancer, and inability to access patient data after neoadjuvant therapy.

Electronic hospital records were reviewed for patient demographics, clinical data, radiological data, treatment data and pathological data. The TNM Classification System of the Union for International Cancer Control (8^{th} edition) was used for pathological analysis (10). Subsequently, clinical results were verified by radiological evaluations to improve diagnosis accuracy. In order to assess the effectiveness of treatment, treatment data such as details about chemotherapy protocols and surgical procedures was categorized. In order to reduce data missingness, patients were contacted and invited to the hospital.

pCR was defined as the absence of residual invasive breast cancer in histopathological samples from both the breast and axillary lymph nodes (ypT0/ypTis-ypN0) (11). Systemic treatment was given by evaluating the analyzed clinical and biological factors according to factors such as age, pre-NAC clinical tumor size (cT) stage, clinical lymph node (cN) stage and histopathological molecular subtype. Systemically, cyclophosphamide, anthracycline and taxane treatments were administered to patients with HER2 expression, trastuzumab and/or pertuzumab treatment, and patients with TNBC were treated with carboplatin according to the National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO) guidelines. Lesions were marked with clips before systemic treatment. The patients were analyzed in two groups according to their NAC treatment response as non-pCR and pCR.

Estrogen receptor (ER), progesterone receptor (PR) and HER2 status were assessed using immunohistochemistry (IHC) analysis. Positivity for ER and PR status was defined as expression in >1% of tumor cells. ER positive and PR positive tumors were classified as luminal type A or B according to their Ki-67 proliferation index < or ≥14. HER2 expression was determined by IHC or fluorescent in situ hybridization (FISH), depending on the situation. The molecular subtypes were classified as luminal-A, luminal-B, luminal-B (HER2-positive), HER2-positive, and triple-negative. As a surgical method, breast-conserving surgery (BCS) or mastectomy was performed according to the results of multicentricity, patient preference and pathological data. As axillary surgical procedure, sentinel lymph node biopsy (SLNB) was performed in case of cN0, with axillary lymph node dissection (ALND) applied if there was a SLNB positivity; for cN positive cases axillary surgical methods (SLNB or ALND) were preferred based on the surgeon's choice.

Statistical Analysis

Open-source statistical programming language R software (Vienna, Austria) was used to analyze the data. In the presentation of numerical data, mean ± standard deviation or median (Q1-Q3) was used according to distribution. Categorical data were presented as n (%). T- test or Mann-Whitney U test was used for numerical data when comparing the two groups. Chi-square or Fisher tests were used to evaluate categorical data. Logistic regression test was used to examine the factors related with pCR (uni-and multivariable). Beyond parameters with a p-value below 0.10 in univariable analysis, clinically important factors were added into the multivariable analysis. When parameters were correlated with each other or used in the definition of a factor, the most important one among them was included in the model. The effect sizes were expressed as odds ratio (OR) with the corresponding 95% confidence interval (CI) and p value. P value <0.05 was considered statistically significant.

RESULTS

The current study included 119 female patients diagnosed with breast cancer, with a mean age of 54.5 ± 11.5 years. In 64 (%53.8) patients, the tumor was located in left breast, and the most common locations in the breast were the outer and upper quadrants. A total of 62 (%52.1) patients were in the premenopausal period.

pCR was observed in 33 (27.7%) patients. pCR for breast was 43 (36.1%) patients and for axilla 58 (48.7%) patients (Figure 1). Among all patients, 51 (42.9%) did not show pCR neither in the breast nor axilla. For 10 (8.4%) patients, there was pCR in the breast but not in the axilla. Demographics and clinical characteristics of patients were presented in Table 1. There was not a statistically significant difference between pCR and non-pCR groups in terms of demographics and personal history.

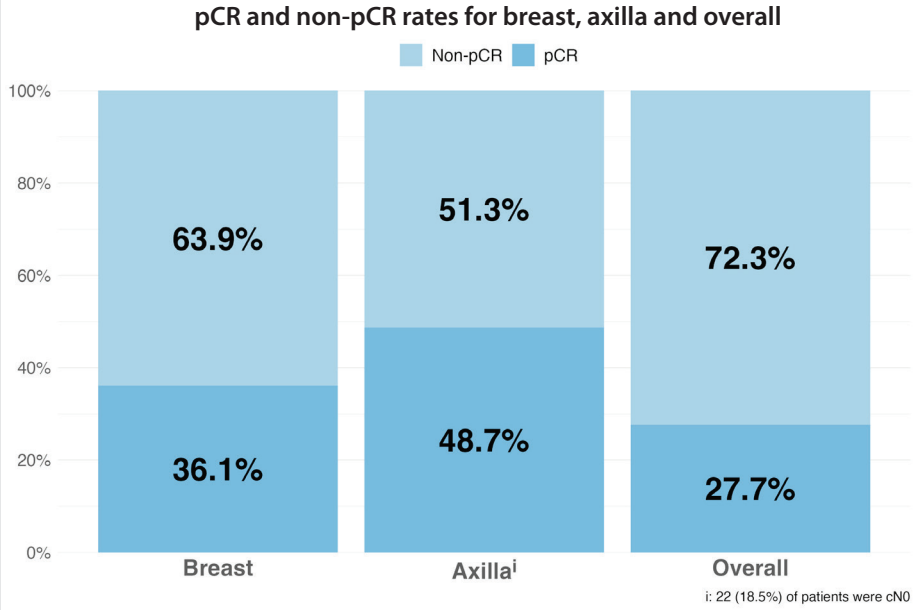

Figure 1. pCR and non-pCR rates for the breast, axilla and overall.

Table 1. Demographics and clinical characteristics of the patients

Variable		All Patients (n= 119)	pCR (n= 33)	Non-pCR (n= 86)	p
Age		54.5 ± 11.5	54.2 ± 10.3	54.6 ± 11.9	0.872
BMI		29.3 (24.9-34)	30.9 (24.3-34.9)	29.1 (25-33.9)	0.684
Smoking		89 (74.8)	23 (25.8)	66 (74.2)	0.578
Family History		38 (31.9)	13 (34.2)	25 (65.8)	0.389
Comorbidity		71 (59.7)	23 (32.4)	48 (67.6)	0.241
ECOG	ECOG-0	91 (76.5)	23 (25.3)	68 (74.7)	0.402
	ECOG-I/II	28 (23.5)	10 (35.7)	18 (64.3)	
Menarche age		13 (12-14)	13 (12-15)	13 (12-14)	0.817
Menopause status	Premenopausal	62 (52.1)	17 (27.4)	45 (72.6)	1.000
	Postmenopausal	57 (47.9)	16 (28.1)	41 (71.9)	
Number of births	No birth	17 (14.3)	2 (11.8)	15 (88.2)	0.221
	1-2 births	48 (40.3)	13 (27.1)	35 (72.9)	
	>2 births	54 (45.4)	18 (33.3)	36 (66.7)	
Age at first labor	No birth	17 (14.3)	2 (11.8)	15 (88.2)	0.062
	>20	74 (62.2)	26 (35.1)	48 (64.9)	
	≤20	28 (23.5)	5 (17.9)	23 (82.1)	
Tumor side	Left	64 (53.8)	21 (32.8)	43 (67.2)	0.258
	Right	55 (46.2)	12 (21.8)	43 (78.2)	
Tumor location[†]					
Central		30 (25.2)	6 (20)	24 (80)	0.391
Upper		68 (57.1)	20 (29.4)	48 (70.6)	0.790
Lower		28 (23.5)	4 (14.3)	24 (85.7)	0.115
Outer		73 (61.3)	21 (28.8)	52 (71.2)	0.914
Inner		21 (17.6)	5 (23.8)	16 (76.2)	0.862

†The patient's tumor may be located in more than one quadrant.
pCR: Pathological complete response, Non-pCR: No pathological complete response, BMI: Body mass index, ECOG: Eastern Cooperative Oncology Group.

Table 2. Radiological/pathological characteristics of the patients

Variable		All Patients (n= 119)	pCR (n= 33)	Non-pCR (n= 86)	p
Tumor size in cm (USG)		2.6 (1.9-3.5)	2.1 (1.9-2.8)	2.8 (1.9-3.8)	0.022
Extent (USG)	Unifocal	74 (62.2)	20 (27)	54 (73)	0.941
	Multifocal/Multicentric	37 (31.1)	11 (29.7)	26 (70.3)	
	Unknown	8 (6.7)	2 (25)	6 (75)	
Extent (Mammography)	Unifocal	54 (45.4)	10 (18.5)	44 (81.5)	0.067
	Multifocal/Multicentric	13 (10.9)	3 (23.1)	10 (76.9)	
	Unknown	52 (43.7)	20 (38.5)	32 (61.5)	
Extent (MRI)	Unifocal	43 (36.1)	16 (37.2)	27 (62.8)	0.220
	Multifocal/Multicentric	32 (26.9)	7 (21.9)	25 (78.1)	
	Unknown	44 (37)	10 (22.7)	34 (77.3)	
ER status	Negative	31 (26.1)	16 (51.6)	15 (48.4)	0.001
	Positive	88 (73.9)	17 (19.3)	71 (80.7)	
PR status	Negative	28 (23.5)	14 (50)	14 (50)	0.006
	Positive	91 (76.5)	19 (20.9)	72 (79.1)	
HER-2 status	Negative (0)	63 (52.9)	11 (17.5)	52 (82.5)	0.004
	Negative (1+)	12 (10.1)	2 (16.7)	10 (83.3)	
	Positive (3+)	44 (37)	20 (45.5)	24 (54.5)	
Ki-67		20 (15-30)	30 (18-30)	20 (12-30)	0.016
Molecular subtype	Luminal-A	23 (19.3)	2 (8.7)	21 (91.3)	0.001
	Luminal-B	37 (31.1)	4 (10.8)	33 (89.2)	
	Luminal-B (HER2-positive)	33 (27.7)	14 (42.4)	19 (57.6)	
	HER2-positive	11 (9.2)	6 (54.5)	5 (45.5)	
	Triple-negative	15 (12.6)	7 (46.7)	8 (53.3)	
Axillary cytology	Benign	11 (9.2)	5 (45.5)	6 (54.5)	0.148
	Non-diagnostic	8 (6.7)	0 (0)	8 (100)	
	Suspicious	3 (2.5)	0 (0)	3 (100)	
	Malign	59 (49.6)	15 (25.4)	44 (74.6)	
	Not-performed	38 (31.9)	13 (34.2)	25 (65.8)	
cT stage	T1	23 (19.3)	4 (17.4)	19 (82.6)	0.593
	T2	79 (66.4)	25 (31.6)	54 (68.4)	
	T3	4 (3.4)	1 (25)	3 (75)	
	T4	13 (10.9)	3 (23.1)	10 (76.9)	
cN stage	N0	33 (27.7)	11 (33.3)	22 (66.7)	0.561
	N1	74 (62.2)	18 (24.3)	56 (75.7)	
	N2	2 (1.7)	1 (50)	1 (50)	
	N3	10 (8.4)	3 (30)	7 (70)	

pCR: Pathological complete response, Non-pCR: No pathological complete response, USG: Ultrasonography, MRI: Magnetic resonance imaging, ER: Estrogen receptor, PR: Progesterone receptor, HER2: Human epidermal growth factor receptor-2, cT: Clinical tumor size, cN: Clinical lymph node.

Radiological and histopathological characteristics are presented in Table 2. Tumor size was lower in the pCR group [2.1 (1.9-2.8) cm] compared to the non-pCR group [2.8 (1.9-3.8) cm] (p= 0.022). Luminal-B [37 (31.1) patients] and luminal-B (HER2-positive) [33 (27.7) patients] subtypes were the most common molecular subtypes. There was a statistically significant difference for ER status (p= 0.001), PR status (p= 0.006), HER2 status (p= 0.004), and Ki-67 (p= 0.016) between the pCR and non-pCR groups.

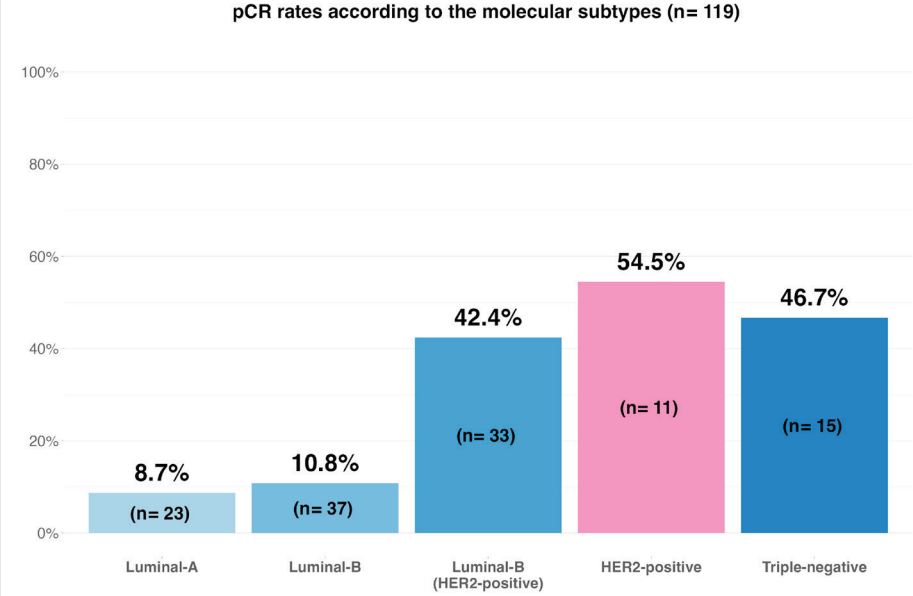

Figure 2. pCR rates according to molecular subtypes.

pCR rates demonstrated a statistically significant difference among the subgroups. Luminal-A and luminal-B showed the highest non-pCR rates. pCR rates according to the molecular subtypes are shown in Figure 2. Treatment- related characteristics are shown in Table 3. The completeness rate of NAC treatment was comparable between the groups (78.8% in pCR and 74.4% in non-pCR groups, p= 0.796). While the surgical management of the breast was similar, management for the axilla showed difference between the groups.

In multivariable regression analysis, the molecular subtype was identified as the sole statistically significant factor for pCR. When the luminal-A group was taken as the reference, no difference was found in terms of pCR for luminal-B [1.15 (0.19-9.35), 0.881]. However, in the luminal-B (HER2-positive) [11.36 (2.31-88.38), 0.007], HER2-positive [11.87 (1.85- 109.53), 0.014], and triple-negative [12.51 (1.99-115.14), 0.012] subgroups, the odds of pCR were higher compared to the luminal-A subgroup. The results of logistic regression analysis for pCR are presented in Table 4.

Table 3. Treatment-related characteristics

Variable		All Patients (n= 119)	pCR (n= 33)	Non-pCR (n= 86)	p
NAC completeness	Completed	90 (75.6)	26 (78.8)	64 (74.4)	0.796
	Not completed	29 (24.4)	7 (21.2)	22 (25.6)	
Surgery (Breast)	BCS	20 (16.8)	7 (21.2)	13 (15.1)	0.601
	Mastectomy	99 (83.2)	26 (78.8)	73 (84.9)	
Surgery (Axilla)	SLNB only	32 (26.9)	18 (54.5)	14 (16.3)	<0.001
	ALND after SLNB	13 (10.9)	1 (3)	12 (14)	
	ALND only	74 (62.2)	14 (42.4)	60 (69.8)	
SLNB technique	Blue dye	41 (34.5)	16 (48.5)	25 (29.1)	0.007
	Technetium + Blue dye	4 (3.4)	3 (9.1)	1 (1.2)	
	No SLNB	74 (62.2)	14 (42.4)	60 (69.8)	
Total removed LNs		14 (8-18)	11 (6-15)	15 (10-18.8)	0.017
Total removed LNs (SLNB)†		5 (4-7)	6 (4-8.5)	5 (4-6)	0.071
Total removed LNs (ALND)‡		16 (13-20.8)	16 (14-20)	16 (12-20.5)	0.588

†Only for patients having SLNB.
‡Only for patients having ALND.
pCR: Pathological complete response, Non-pCR: No pathological complete response, NAC: Neoadjuvant chemotherapy, SLNB: Sentinel lymph node biopsy, ALND: Axillary lymph node dissection, LN: Lymph node.

Table 4. Logistic regression analysis for pCR

Variable		ORs (Univariable)†	ORs (Multivariable)†
Age	<55	-	-
	≥55	0.83 (0.37-1.86, p= 0.657)	1.49 (0.54-4.34, p= 0.447)
Age at first labor	No birth	-	-
	>20	4.06 (1.04-27.05, p= 0.076)	5.43 (1.09-42.26, p= 0.060)
	≤20	1.63 (0.31-12.42, p= 0.587)	1.11 (0.16-10.32, p= 0.917)
Extent (Mammography)	Unifocal	-	-
	Multifocal/Multicentric	1.32 (0.26-5.32, p= 0.710)	0.67 (0.11-3.44, p= 0.641)
	Unknown	2.75 (1.16-6.88, p= 0.025)	2.82 (0.99-8.53, p= 0.057)
NAC completeness	Completed	-	-
	Not completed	0.78 (0.28-1.99, p= 0.620)	0.43 (0.13-1.36, p= 0.164)
cT stage	T1/T2	-	-
	T3/T4	0.77 (0.21-2.40, p= 0.677)	0.81 (0.18-3.30, p= 0.774)
cN stage	N0/N1	-	-
	N2/N3	1.34 (0.34-4.62, p= 0.648)	0.99 (0.21-4.21, p= 0.992)
Molecular subtype	Luminal-A	-	-
	Luminal-B	1.27 (0.23-9.76, p= 0.791)	1.15 (0.19-9.35, p= 0.881)
	Luminal-B (HER2-positive)	7.74 (1.85-53.50, p= 0.013)	11.36 (2.31-88.38, p= 0.007)
	HER2-positive	12.60 (2.20-106.63, p= 0.008)	11.87 (1.85-109.53, p= 0.014)
	Triple-negative	9.19 (1.79-71.30, p= 0.014)	12.51 (1.99-115.14, p= 0.012)

†ORs were presented as odds ratio (95% confidence intervals, p value).

pCR: Pathological complete response, OR: Odds ratio, NAC: Neoadjuvant chemotherapy, cT: Clinical tumor size, cN: Clinical lymph node, HER2: Human epidermal growth factor receptor-2.

DISCUSSION

In the study evaluating breast cancer patients undergoing NAC, pCR rate, defined as the absence of residual invasive cancer in both breast and axillary lymph nodes, was found to be 27.7%. Despite cT and cN not exhibiting statistical significance in relation to pCR, factors such as tumor size, ER status, PR status, HER2 status, and Ki-67 index were identified as potential factors with pCR. In multivariable analysis, the molecular subtype emerged as a significant risk factor. Notably, while pCR rates were low in luminal-A and luminal-B subtypes, higher pCR rates were observed in HER2-positive and triple-negative groups.

In breast cancer treatment, achieving pCR is vital as it means that no cancer remains in the breast and lymph nodes after treatment. The general approach to pCR involves treatment strategies for both the primary tumor and lymph nodes. The presented study, in line with the existing literature, reveals that 36.1% of the patients achieved breast pCR, while 48.7% achieved axillary pCR (8,12). Remarkably, 8.4% achieved breast pCR without an axillary response. The significance of achieving axillary pCR after primary systemic treatment cannot be overstated, as it plays a crucial role in reducing the risk of relapse and improving overall survival, particularly in the axillary region. Research at the University of Texas MD Anderson Cancer Center has underscored the significance of axillary pCR, linking it to improved 10-year survival following systemic therapy (13). However, there is an ongoing debate about whether pCR should also indicate the absence of ductal carcinoma in situ (DCIS). Findings from the I-SPY2 trial suggest that the presence or absence of DCIS does not significantly impact the outcomes (7). Standardizing pCR definition and learning more about its clinical effects are important for managing and predicting the prognosis of breast cancer patients who are going through neoadjuvant therapy.

Breast cancer treatments incorporating carboplatin, pembrolizumab, and anti-HER agents have notably increased pCR rates in triple-negative and HER2 subtypes (14,15). According to the data from the presented study, receptors for ER, PR, and HER2 may play pivotal roles in achieving pCR, with the literature corroborating lower pCR rates in luminal-A and luminal-B subtypes (8,9,16). Conversely, luminal-B (HER2-positive), HER2-positive, and triple-negative subtypes have demonstrated appreciably higher pCR rates, underscoring the importance of subtypes in treatment to the success of a complete response. The study also demonstrated that Ki-67 levels, along with the molecular subtype, is a significant

factor of pCR (17). Similarly, the EORTC 10994/BIG 1-00 study emphasized that pCR following chemotherapy is robustly linked with both breast cancer subtype and long-term survival, further illuminating the prognostic implications of pCR (18).

In the presented study, not completing NAC did not significantly affect pCR rates likely due to the small patient sample. However, a meta-analysis has shown that patients who do not complete NAC often have lower pCR rates (19). Adding to the prognostic factors affecting pCR, recent studies have indicated a possible link between higher body mass index (BMI) and decreased pCR rates in breast cancer patients undergoing NAC (20) though the presented study did not find BMI to significantly alter pCR outcomes. The number of patients in the presented study may not be sufficient to determine the true prognostic value of BMI on treatment effectiveness. Analysis from the presented study suggested that neither age nor menopausal status significantly differentiated pCR from non-pCR groups. While some studies point to age as a potential influencer of pCR rates in NAC, other studies, including the one discussed, report no meaningful correlation (3,21,22). Studies also indicate, aligning with the findings from the current study, that menopausal status does not play a crucial role in pCR (21,22).

NAC aims to reduce surgical extent in breast cancer treatment, as established by previous research. Contrarily, the presented study observed a preference for more extensive surgeries, including ALND, even when NAC was administered. The ACOSOG Z1071 (Alliance) trial has demonstrated an association of tumor biology with higher rates of BCS (8). Additionally, axillary pCR rates post-NAC are significantly affected by breast cancer subtypes, particularly in hormone receptor (HR) negative/HER2-positive and triple-negative cases (23). Patients undergoing ALND report more frequent adverse effects like motor neuropathy, sensory neuropathy, and lymphedema (24). Due to these complications, there is a shifting preference towards less invasive treatments over ALND (25). The presented study showed high rates of ALND and mastectomy based on physician and patient preferences.

The presented study had limited radiological access opportunities and did not include survival and recurrence analyses with a retrospective nature. Sample sizes for certain breast cancer subtypes and biomarker groups were small, which might limit the generalizability of our results. The research was confined to a single center, which could influence the applicability of the findings to a wider population. Future studies should aim to incorporate the relation between pCR and survival outcomes.

CONCLUSION

The presented study demonstrates variations in pCR rates among molecular subtypes, highlighting more favorable responses in HER2-positive and triple-negative patients compared to other subtypes. Luminal-type breast tumors exhibited significantly lower pCR rates. Future investigations should focus on these findings, emphasizing personalized treatment strategies targeting molecular subtypes for enhanced responses to NAC.

Ethics Committee Approval: This study was approved by Karadeniz Technical University Faculty of Medicine Scientific Research Ethics Committee (Decision date: 01.02.2022, No: 24237859-51).

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Author Contributions: Concept - All of authors; Design - All of authors; Supervision - AG, AG; Data Collection and/or Processing - AG, AG; Analysis and/or Interpretation - All of authors; Literature Search - AG, MU, AG; Writing Manuscript - AG, AG; Critical Reviews - All of authors.

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Neoadjuvan kemoterapi sonrası meme kanserinde patolojik tam yanıt ve ilişkili faktörler: Retrospektif çalışma

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ÖZET

Giriş ve Amaç: Bu çalışmanın amacı, neoadjuvan kemoterapi (NAC) uygulanan meme kanseri hastalarında patolojik tam yanıtı (pCR) belirleyen klinik ve patolojik faktörleri tespit etmektir.

Gereç ve Yöntem: İnvaziv meme kanseri teşhisi patoloji ile konulmuş, Temmuz 2016 ile Ekim 2021 tarihleri arasında NAC almış, 18 yaş üstü kadınları değerlendiren retrospektif, tek merkezli bir çalışma yürütüldü. Hasta demografik verileri, klinik, radyolojik, tedaviye ait ve patolojik veriler elektronik hastane kayıtları gözden geçirilerek elde edildi. Birincil amaç pCR olarak tanımlandı ve bu, hem meme hem de aksiller lenf düğümlerinde rezidüel invaziv meme kanserinin yokluğu olarak belirlendi. pCR ile ilişkili faktörleri belirlemek için çok değişkenli lojistik regresyon analizi kullanıldı.

Bulgular: Analize toplam 119 hasta dahil edildi. Yaş dağılımı 54,5 ± 11,5 yıl idi. pCR 33 (%27,7) hastada gözlendi. Meme dokusu için pCR 43 (%36,1) hastada mevcuttu. Klinik evre ile pCR arasında istatistiksel olarak anlamlı bir ilişki saptanmadı. Multivariabl modelde yaş, ilk doğum yaşı, memedeki hastalığın yayılımı, NAC'nin tamamlanma durumu, klinik tümör boyutu (cT) evresi, klinik lenf nodu (cN) evresi ve moleküler alt tip analiz edildi. Analiz, moleküler alt tipin pCR ile ilişkili tek bağımsız faktör olduğunu gösterdi. Moleküler alt tiplere göre pCR oranları: luminal-A'da %8,7, luminal-B'de %10,8, insan epidermal büyüme faktörü reseptörü 2 (HER2)-pozitifte %54,5, luminal B (HER2-pozitif)'te %42,4 ve üçlü negatiflerde %46,7 idi. Luminal-A ve luminal-B alt grupları arasında istatistiksel olarak anlamlı bir fark bulunmadı (odds oranı 1,15, %95 güven aralığı 0,19-9,35, p= 0,881). HER2-pozitif ve üçlü negatif gruplardaki hasta sayısı sınırlı olmasına rağmen, her ikisi de referans grubuna göre istatistiksel olarak anlamlı derecede daha yüksek oddsa sahipti.

Sonuç: Sunulan çalışma, meme kanseri hastalarında neoadjuvan kemoterapiye yanıtın belirlenmesinde moleküler alt tiplerin önemini vurgulamaktadır. Özellikle HER2-pozitif ve üçlü negatif alt tipler, daha olumlu yanıt oranları sergileyebilir.

Anahtar Kelimeler: Meme kanseri, neoadjuvan kemoterapi, patolojik tam yanıt, moleküler alt tipler

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