Racial Disparities in pCR in Patients with HER2 Positive Breast Cancer Treated with Neoadjuvant Chemotherapy

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Background

- Black women have the highest breast cancer death rate.[1]
- Patients who achieve a pathologic complete response (pCR) following neoadjuvant chemotherapy (NAC) have better oncologic outcomes, including improved rates of recurrence and survival.
- Black patients with human epidermal growth factor receptor 2 (HER2)-positive breast cancers have lower rates of pCR following NAC.[2-3]
- In the setting of a clinical trial, there is no substantial difference in pCR and oncologic outcomes according to race suggesting variation in clinical practice.[4]
- Data looking at biologic and socioeconomic factors that may contribute to disparities in pCR rates are inconsistent and lacking.[5]

Study Objective

- The aim of this study was to identify factors that contribute to disparities in achieving pCR in HER2-positive breast cancers who received NAC.

Methods

- After IRB approval, a retrospective review of an institutional tumor registry identified women with HER2-positive breast cancers who underwent NAC followed by surgery from 2016 to 2022.
- Sociodemographic factors, clinicopathologic features, and treatment variables were compared between patients self-identified as Black, White, and Other.
- Univariate analysis was used to examine demographic and clinical factors associated with achieving a pCR in both the breast and axilla.
- The Wilcoxon rank sum test was used to compare continuous variables and the Fisher exact test was used to compare categorical variables.
- A *p*-value of <0.05 was considered statistically significant.

Results

- The study included 445 women with a median age of 54 (range 22-86) and a median follow-up of 48 months (range 7-110).
- A total of 355 (79.8%) self-identified as White, 58 (13.0%) Black, and 32 (7.2%) Other.

Results

Table 1. Clinicopathologic Characteristics According to Race.

	White (n=355)	Black (n=58)	Other (n=32)	p-value
Age				
<50 years	133 (37.5%)	18 (31.0%)	19 (59.4%)	**0.03**
≥50 years	222 (62.5%)	40 (69.0%)	13 (40.6%)	
Charlson Comorbidity Index				
0	213 (60%)	27 (46.6%)	20 (62.5%)	0.31
1	67 (18.9%)	16 (27.6%)	7 (21.9%)	
≥2	75 (21.1%)	15 (25.9%)	5 (15.6%)	
Insurance				
Government	133 (37.5%)	27 (46.6%)	8 (25%)	0.13
Private	222 (62.5%)	31 (53.5%)	24 (75%)	
HR status				
Positive	229 (64.5%)	38 (65.5%)	19 (59.4%)	0.82
Negative	126 (35.5%)	20 (34.5%)	13 (40.6%)	
HER2 IHC Score				
2+	27 (7.6%)	5 (8.6%)	3 (9.4%)	0.84
3+	328 (92.4%)	53 (91.4%)	29 (90.6%)	
Overall Grade				
1	0 (0%)	0 (0%)	1 (3.1%)	0.14
2	55 (15.5%)	7 (12.1%)	6 (18.8%)	
3	300 (84.5%)	51 (87.9%)	25 (78.1%)	
Clinical Stage				
1	61 (17.2%)	12 (20.7%)	5 (15.6%)	0.86
2	218 (61.4%)	33 (56.9%)	22 (68.8%)	
3	76 (21.4%)	13 (22.4%)	5 (15.6%)	
Chemotherapy regimen				
Anthracycline-based	7 (1.97%)	1 (1.7%)	0 (0%)	>0.99
HP	1 (0.3%)	0 (0%)	0 (0%)	
TCHP	347 (97.8%)	57 (98.3%)	32 (100%)	
Completed Chemotherapy				
Yes	342 (96.3%)	57 (98.3%)	31 (96.9%)	0.89
No	12 (3.66%)	1 (1.7%)	1 (3.1%)	
Median number of days from diagnosis to initiation of chemotherapy (IQR)	30 (23-40)	30.5 (25-41)	31.5 (26.5-41.5)	0.85
Median number of days from completion of chemotherapy to surgery (IQR)	19 (11-33)	22 (13-39)	22 (13.5-32.5)	0.26

Table 2. Rates of pCR According to Race.

	White (n=355)	Black (n=58)	Other (n=32)	p-value
pCR Breast	200 (56.3%)	25 (43.1%)	22 (38.8%)	0.051
pCR Axilla	290 (81.7%)	47 (81.0%)	28 (87.5%)	0.76
pCR Breast + Axilla	191 (53.8%)	24 (41.4%)	20 (62.5%)	0.11

Results

Table 3. Factors Associated with pCR.

	pCR (n=235)	Residual disease (n=210)	p-value
Race			
White	191 (81.3%)	164 (78.1%)	0.11
Black	24 (8.2%)	34 (16.2%)	
Other	20 (8.5%	12 (5.7%)	
Age			
<50 years	102 (43.4%)	68 (32.4%)	**0.02**
≥50 years	133 (56.6%)	142 (67.6%)	
Charlson Comorbidity Index			
0	143 (60.9%)	117 (55.7%)	0.16
1	50 (21.3%)	40 (19.1%)	
≥2	42 (17.9%)	53 (25.2%)	
Insurance			
Government	77 (32.8%)	91 (43.3%)	**0.02**
Private	158 (67.2%)	119 (56.7%)	
HR status			
Positive	119 (50.6%)	167 (79.5%)	**<0.001**
Negative	116 (49.4%)	43 (20.5%)	
HER2 IHC Score			
2+	9 (3.83%)	26 (12.4%)	**0.001**
3+	226 (96.2%)	184 (87.6%)	
Overall Grade			
1	0 (0%)	1 (0.5%)	**0.01**
2	26 (11.1%)	42 (20.0%)	
3	209 (88.9%)	167 (79.5%)	
Clinical Stage			
1	37 (15.7%)	41 (19.5%)	**0.007**
2	135 (57.5%)	138 (65.7%)	
3	63 (26.8%)	31 (14.8%)	
Chemotherapy regimen			
Anthracycline-based	4 (1.7%)	4 (1.9%)	>0.99
HP	1 (0.4%)	0 (0%)	
TCHP	230 (97.9%)	206 (98.1%)	
Completed Chemotherapy			
Yes	228 (97.0%)	202 (96.2%)	0.79
No	7 (3.0%)	8 (3.8%)	
Median number of days from diagnosis to initiation of chemotherapy (IQR)	30 (23-38)	31 (25-42)	0.16
Median number of days from completion of chemotherapy to surgery (IQR)	18 (11-32)	21 (11-34)	0.38

Conclusions

- Black patients had the lowest rate of pCR compared to patients self-identified as White or Other, although this difference was not statistically significant.
- The higher likelihood of Black patients being diagnosed with HER2-positive breast cancer at ≥50 years may account for the differences in achieving pCR, however more research to understand disparities in outcomes are needed.

References

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