

# It is Not Us, it Might be the Hormones: An Exploration of The Linkage of Hormone Status and Breast Cancer

Tayce Z. Jacques, Brittany James, DrPH  
Spelman College | Atlanta, GA

## Introduction

**Approximately 264,000 women are diagnosed with breast cancer yearly, and about 42,000 women die yearly; specifically, Black women tend to have a higher rate of death than their white counterparts.**

- Using data from the 2017 November update of the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI), this study explores how Black women's estrogen and progesterone receptors link to the diagnosis of infiltrating duct and lobular carcinoma breast cancer.
- Exploration is necessary because approximately 1 out of 8 women are diagnosed with breast cancer in a lifetime, which impacts many women and makes it essential to find causes, explore, and further understand women's health. Therefore, the purpose of this study is to explore the relationship between breast cancer diagnosis or development and hormone.

## Methods

**The data provides a information about infiltrating duct and lobular carcinoma in hopes of reducing the cancer burden in this population. In this particular data set, variables are patient demographics, stage of cancer, tumor characteristics, and status of estrogen/progesterone status.**

- The sample was limited to only females diagnosed with infiltrating duct and lobular carcinoma in 2006-2010.
- Patients with unknown tumor size, regional positive lymph nodes (LNs), examined regional LNs, and a survival period of less than one month are not a part of this data set.
- Assessing variables such as age, marital status, and stage of cancer help to investigate characteristics of Black women diagnosed with breast cancer.

**The design of this study is to use chi-square analysis to explore associations between the variables of 291 Black women who were diagnosed with infiltrating duct and lobular carcinoma breast cancer in 2006-2010.**

## Results

There were **291** Black women included in the analysis. Results show that the sample was between ages 31 and 69 (M=52.58, SD=9.050). The majority of the women in this study were split between being married (n=113; 38.8%) or single/never married (n=102; 35.1). The remainder of the sample was divorced (n=40; 13.7%); widowed (n=28; 9.6%); or separated (n=8; 2.7%). Regarding hormone presence, the majority of women had both estrogen and progesterone present (n=225; 77.5%), followed by progesterone only (n=34; 11.7%), neither (n=30; 10.3%), and estrogen only (n=3; 1.0%).

As can be seen by the frequencies cross tabulated in Table 2, there is no statistically significant relationship between hormone presence, and T-stage, N-stage, A-stage, nor sixth stage; therefore, the null hypotheses for these variables are accepted, and it is concluded that there is no association between hormone presence and breast cancer stage among Black women in the SEER database. **Although results demonstrated no significant relationship between hormone status and cancer stage however some patterns are revealed.**

**Figure 1. Comparison of T-stage, N-stage, and sixth stage diagnosis among Black women with estrogen and progesterone, progesterone only, or neither hormone present.**

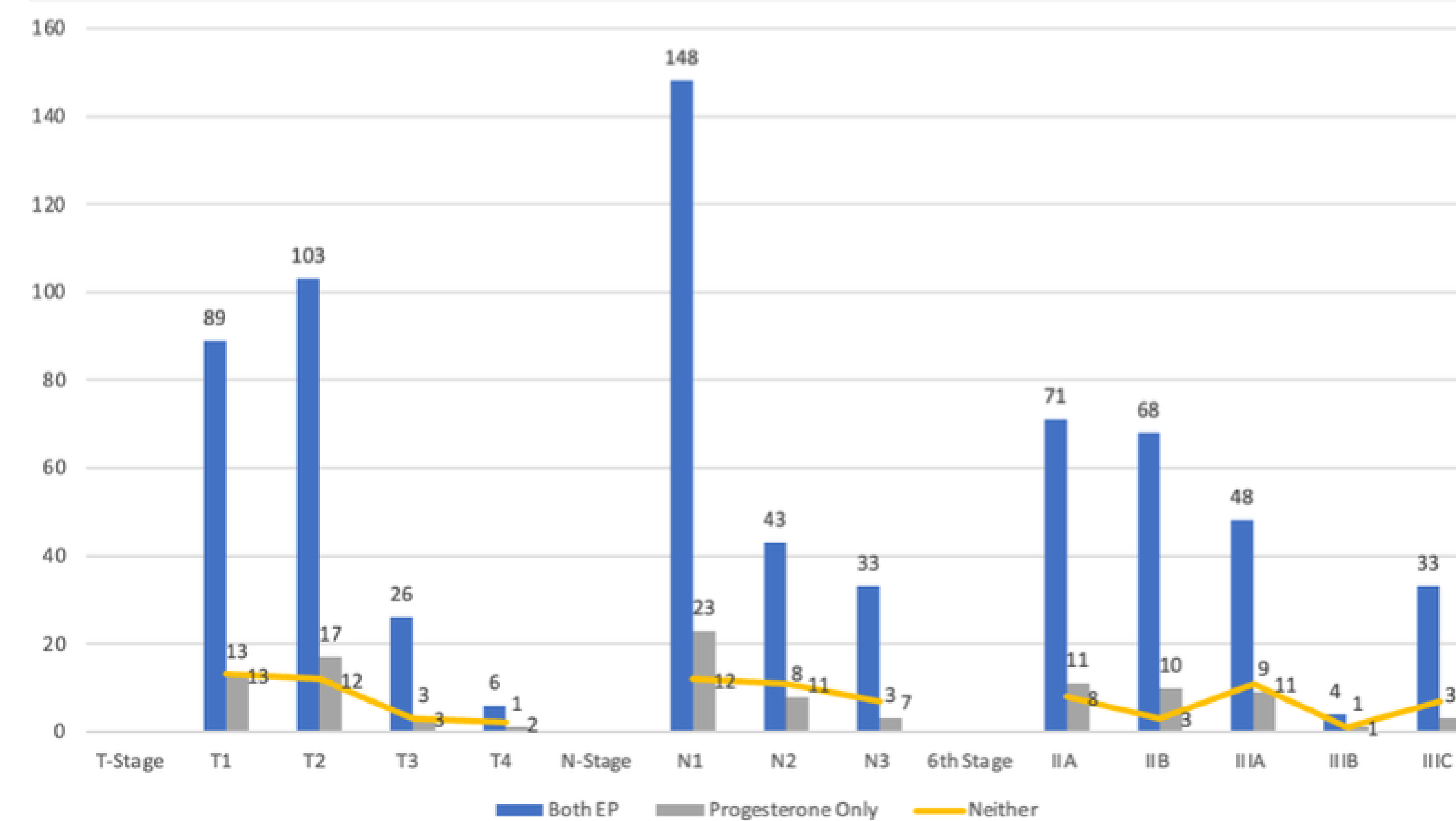


Figure 1 notes an important finding, which is the relationship between categories of each stage for women with both estrogen and progesterone present, those with progesterone only, and those with neither. According to this data, estrogen and progesterone presence tends to decline as the stages' severity increases - similar to those with progesterone only or neither hormone present. While this pattern is not generalizable to the larger population of Black women with breast cancer, among this sample, women received their staging diagnosis early, which is not commonly supported in the literature.

**Table 2. Bivariate results for hormone status by T-stage, N-stage, A-stage, and sixth stage, N=291.**

	Hormone Presence, n (%)			
	Both EP	Estrogen Only	Progesterone Only	Neither
<b>T-Stage</b>	$\chi^2=5.362, p=0.802$			
T1	89 (39.7)	2 (66.7)	13 (38.2)	13 (43.3)
T2	103 (46.0)	0 (0)	17 (50.0)	12 (40.0)
T3	26 (11.6)	1 (33.3)	3 (8.8)	3 (10.0)
T4	6 (2.7)	0 (0)	1 (2.9)	2 (6.7)
<b>N-Stage</b>	$\chi^2=10.278, p=0.113$			
N1	148 (66.1)	1 (33.3)	23 (67.6)	12 (40.0)
N2	43 (19.2)	1 (33.3)	8 (23.5)	11 (36.7)
N3	33 (14.7)	1 (33.3)	3 (8.8)	7 (23.3)
<b>A-Stage</b>	$\chi^2=2.772, p=0.428$			
Distant	6 (2.7)	0 (0)	0 (0)	2 (6.7)
Regional	218 (97.3)	3 (100.0)	34 (100.0)	28 (93.3)
<b>6<sup>th</sup> Stage</b>	$\chi^2=11.299, p=0.504$			
IIA	71 (31.7)	1 (33.3)	11 (32.4)	8 (26.7)
IIB	68 (30.4)	0 (0)	10 (29.4)	3 (10.0)
IIIA	48 (21.4)	1 (33.3)	9 (26.5)	11 (36.7)
IIIB	4 (1.8)	0 (0)	1 (2.9)	1 (3.3)
IIIC	33 (14.7)	1 (33.3)	3 (8.8)	7 (23.3)

## Discussion & Conclusions

- Most Black women tend to be diagnosed at later stages; therefore, this subsample of participants is unique to the discussion on stage of diagnosis for Black women.
- Breast cancer is a hormone-related cancer**, and functionality of a woman's body depends on hormone production. In this study, the lack of Black women included causes more significant racial inequality and less data variation.
- As it is known, **Black women have a higher rate of death in correlation to breast cancer**, and there should be a more national and local collection of data to progress the understanding of the population.
- Further research to expand the comprehension of hormone-related causes of breast cancer is necessary to decrease the mortality rates for all patients and improve treatment options.
- No significant patterns in how the hormones are present in the various stages existed, **further adding to the mystique of breast cancer development, particularly among Black women.**

