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Disparities in Utilization of Mammogram Screening and Incidence of Postmenopausal Metastatic Breast Cancer in Asian American Women

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Abstract

Introduction: The incidence of metastatic breast cancer is rising, but few studies have analyzed Asian American women with a focus on screening and obesity rates.

Methods: Data from the U.S. Cancer Statistics were examined for trends and incidence rates of breast cancer. Using the Center for Disease Control data mammogram compliance and obesity rates in Asian women were analyzed.

Results: Over our 18-year study period, the incidence of postmenopausal metastatic breast cancer increased by 2.19% annually in Asian women compared to only 1.03% in White women. Asians also had higher rates of mammogram non-compliance compared to other racial groups. Of Asians, the rates of obesity in postmenopausal women were highest in those aged 65-74 years.

Discussion: Compared to other races, Asians have the highest increase in the incidence of metastatic breast cancer with lower rates of screening mammograms. Further research is needed to better understand these disparities.

Keywords: Breast cancer screening; Mammogram, Race; Disparities; Obesity; Asian; Postmenopausal

Abbreviations: U.S: United States; USCS: United States Cancer Statistics; SEER: National Cancer Institute's

Surveillance, Epidemiology, and End Results; CDC: Centers for Disease Control and Prevention; BRFSS: Behavioral Risk Factor Surveillance System; AAPC: Average Annual Percent Change; ABPC: Average Biennial Percent Change; CI: Confidence Interval; BMI: Body Mass Index

Introduction

Breast cancer remains the most common cancer and the second most common cause of cancer death among women in the United States. It is estimated that 297,790 new cases of breast cancer and 43,170 deaths will occur in women in 2023, with a rising incidence [1]. Up to six percent of new breast cancer cases are diagnosed in the metastatic stage, and most of these women are postmenopausal [2].

Given that breast cancer is screenable, access to mammography may detect cancers in an early stage before the development of metastases. Prior studies have found that Black and Hispanic women have lower access to and adoption of mammogram screening; however, few studies have focused on the Asian population. In addition to access to healthcare, there is limited information on trends such as obesity among minority subgroups [3].

In this current report, we examined the trends and incidence rates of postmenopausal metastatic breast cancer in Asian American women. Furthermore, we explored risk factors that may be responsible such as obesity rates and lack of screening mammography. We then performed an intersection analysis to identify subgroups at risk based on demographics and geographic regions.

Methodology

Data were obtained from the United States Cancer Statistics (USCS) database from 2001-2018, including the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program, and the Centers for Disease Control (CDC) and Prevention Behavioral Risk Factor Surveillance System (BRFSS) from 2000-2018 for this cross-sectional study [4]. Data were then analyzed for females with postmenopausal breast cancer diagnosed with metastatic disease. Intersection analysis was performed by race, region of location in the U.S, and mammography rates. The incidences and trends of metastatic breast cancer per 100,000 women were calculated using SEER*Stat 8.3.9.2 and the joinpoint regression program 4.9.0.0. The trend was presented as Average Annual Percent Change (AAPC) or Average Biennial Percent Change (ABPC). Trends were characterized by AAPC with 95% Confidence Intervals (CI) and significant if $p<0.05$. Furthermore, using the CDC data we examined the rates and trends of obesity as Body Mass Index (BMI) ≥ 30 among women by race and age.

Results

Using USCS data from 2001-2018, we showed that the incidence of metastatic breast cancer increased from 16.58 to 19.48 (per 100,000 women). Over the 18-year study, the incidence rate of metastatic breast cancer increased the most for postmenopausal Asian women at 2.19% annually ($p<0.001$) compared to only 1.42%, 1.06%, and 0.81% ($p<0.001$) in Black, White, and Hispanic women, respectively

(Figure 1). On intersection analysis, Asian women residing in the U.S. Northeast region were found to have the highest annual increase at 2.52% (p<0.05).
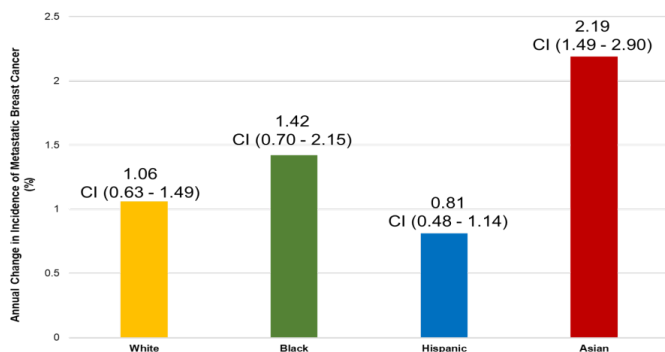

Figure 1: The average annual change in postmenopausal metastatic breast cancer incidence rates by race. CI is represented as the 95% confidence interval per category is displayed above each bar. **Note:** ( ) White; ( ) Black; ( ) Hispanic; ( ) Asian.

Using the screening data from the Behavioral Risk Factor Surveillance System survey over the 18 years of our study, White, Black, and Hispanic women improved their screening compliance by 3.43%, 3.32%, and 1.24% (p<0.05), whereas the compliance of Asian women did not change (0.80%, p=0.41). More specifically, up to 6.35% of Asian women aged 50-54 never had a mammogram. Rates of mammogram adherence in 2018 by race and age are displayed in Figure 2. Furthermore, on intersectional analysis, we found that over all age groups, Asian women aged 50-54 residing in the West region of the U.S. appear to have the highest rate of non-compliance at 6.50%.
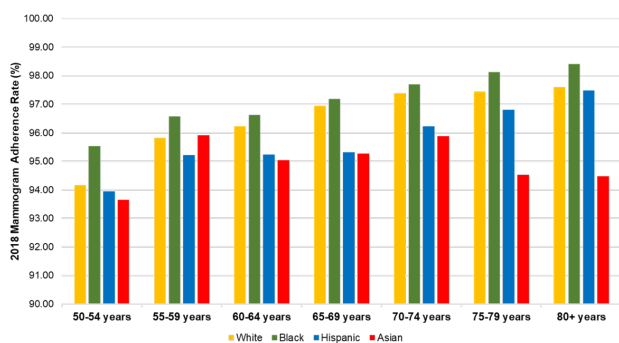

Figure 2: Graphical representation of the adherence rate (%) in 2018 by age group and race. Adherence rates were calculated by 100-nonadherent%. Overall, rates of screening mammogram improved for all age groups in White, Black, and Hispanic women, but remained the lowest among Asian women. **Note:** ( ) White; ( ) Black; ( ) Hispanic; ( ) Asian.

Given previously identified significant risk factors associated with breast cancer, we examined the rates and trends of obesity using the Centers for Disease Control survey data [5]. Our results demonstrated that obesity incidence has been increasing for Asian American women from 9.06 per 100,000 in 2001 to 12.80 per 100,000 in 2016 (p<0.01). Particularly among postmenopausal Asian women, the incidence of obesity increased most in those aged 65-74 years, with an annual increase of 2.29% (p<0.004) as depicted in Figure 3.
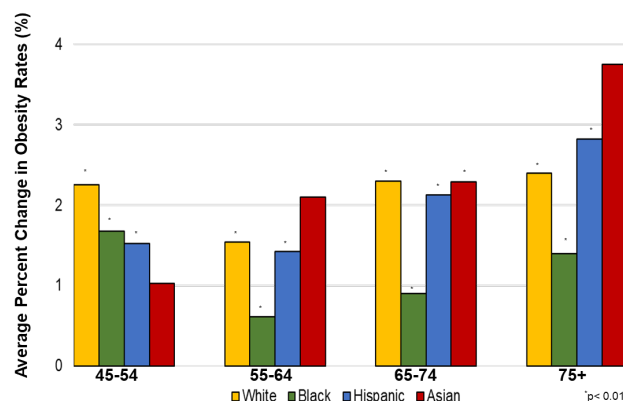

Figure 3: Displays the average annual percent change in obesity rates of women based on race and age. All populations had p values<0.01, except for Asian women aged 45-54 (p=0.104), 55-64 (p=0.066), and 75+(p=0.184). **Note:** ( ) White; ( ) Black; ( ) Hispanic; ( ) Asian.

Discussion

Over our 18-year study, we found that postmenopausal Asian women had the highest increase in metastatic breast cancer incidence per year. In addition to the increased rates of obesity in this population, Asian women did not have an improvement in mammogram compliance compared to other races.

Similarly to our findings, researchers used the National Health and Nutrition Examination Survey in a population-based study, demonstrating a significant trend of increasing obesity rates in Asian Americans [6]. Although their study only used seven years of data from the U.S., we incorporated data analysis from 2001-2016. Further research is needed to analyze the Asian American population and modifications of BMI threshold for obesity, waist circumference, and abdominal adiposity.

Other researchers have portrayed that Asian Americans are less likely to undergo cancer screening than other races. This disparity may be explained by differences in cultural perceptions of Western medicine, medical literacy, language barriers, environmental exposures, availability of healthcare insurance, and additional social determinants of health [7]. In this current report, our intersection analysis showed that Asians residing in the Western U.S. have high rates of non-compliance, suggesting implications for a pilot project directed at vulnerable populations.

This study is limited by the lack of a single dataset which may account for varying estimates of cases based on the prevalence of the Asian American population. Additionally, our data did not obtain further classification of Asian subgroups and by their immigration status. We also only focused on postmenopausal metastatic breast cancer without regard to subtype or genomic characterization of breast cancers. Future studies are needed to identify further risk factors, gaps in care, and expansion to include other chronic diseases in this demographic.

Our data suggest that tailored population-based interventions aimed at addressing obesity and improving screening mammography are needed for Asian American women who remain at higher risk for postmenopausal metastatic breast cancer.

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