



Original article

Acculturation, Behavioral Factors, and Family History of Breast Cancer among Mexican and Mexican-American Women



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Article history: Received 25 September 2014; Received in revised form 22 May 2015; Accepted 26 May 2015

ABSTRACT

Background: Incidence rates for breast cancer are higher among Mexican-American (MA) women in the United States than women living in Mexico. Studies have shown higher prevalence of breast cancer risk factors in more acculturated than less acculturated Hispanic/Latinas in the United States. We compared the prevalence of behavioral risk factors and family history of breast cancer by level of acculturation and country of residence in women of Mexican descent.

Methods: Data were collected from 1,201 newly diagnosed breast cancer patients living in Mexico ($n = 581$) and MAs in the United States ($n = 620$). MA participants were categorized into three acculturation groups (Spanish dominant, bilingual, and English dominant); women living in Mexico were used as the referent group. The prevalence of behavioral risk factors and family history of breast cancer were assessed according to acculturation level, adjusting for age at diagnosis and education.

Results: In the adjusted models, bilingual and English-dominant MAs were significantly more likely to have a body mass index of 30 kg/m² or greater, consume more than one alcoholic beverage a week, and report having a family history of breast cancer than women living in Mexico. All three U.S. acculturation groups were significantly more likely to have lower total energy expenditure (≤ 533 kcal/d) than women in Mexico. English-dominant women were significantly less likely to ever smoke cigarettes than the Mexican group.

Conclusions: Our findings add to the limited scientific literature on the relationships among acculturation, health behavior, and family history of breast cancer in Mexican and MA women.

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Funding statement: This work was supported by NIH/NCI (U01CA153086, CA023074-2953, CA116199-02S1); Cancer Center Support Grant (P30CA023074); the Avon Foundation; the Susan G. Komen for the Cure® (KG090934); and the ACS Mentored Research Scholar grant MRSG-11-102-01-CPPB-ACS/MRSG. The authors have no conflicts to disclose.

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Breast cancer is the most commonly diagnosed cancer in Hispanic/Latina women in the United States (American Cancer Society [ACS], 2012). Although women from this ethnic group have a lower incidence of breast cancer (91.1 per 100,000) than non-Hispanic White (NHW) women (127.3 per 100,000; Siegel, Ma, Zou, & Jemal, 2014), they present less frequently with localized disease (ACS, 2012), and their risk of dying from breast

cancer is higher compared with NHW women, even after adjustment for age and stage (Jemal et al., 2004), and after adjustment for age, stage, treatment, and hormone receptor tumor status (Ooi, Martinez & Li, 2011). Lower survival rates in Hispanic/Latina women could be attributed to a variety of factors including lower rates of preventative screening and delayed follow-up of abnormal screening tests (ACS, 2012), higher prevalence of poor prognostic factors (e.g., younger age at diagnosis, unfavorable tumor subtypes; ACS, 2012; Ooi et al., 2011), or lack of access to appropriate treatment after diagnosis (ACS, 2012; Siegel et al., 2014).

Risk for breast cancer varies among Hispanic/Latina women by country of origin and acculturation (John, Phipps, Davis, & Koo, 2005; Keegan et al., 2010). According to John et al. (2005), breast cancer risk is significantly lower in foreign-born compared with U.S.-born Hispanic/Latina women; furthermore, risk increases with each successive year lived in the United States. Arguably, changes in breast cancer risk within the same racial/ethnic group cannot be explained by genetic differences alone and are likely influenced by other risk factors, including behavioral and reproductive factors (Slattery et al., 2012).

According to the ACS (2011), physical inactivity, postmenopausal obesity, and alcohol consumption are lifestyle factors associated with an increased risk for breast cancer; increased risk from cigarette smoking remains inconclusive (ACS, 2011; Warren, Alberg, Kraft, & Cummings, 2014). Existing studies comparing established nonreproductive risk factors for breast cancer between Hispanic/Latina and NHW women have reported Hispanics to be more physically active (John, Horn-Ross, & Koo, 2003), have a higher body mass index (BMI; Hines et al., 2010; John, Sangaramoorthy, Phipps, Koo, & Horn-Ross, 2011), are less likely to report a family history of breast cancer (Hines et al., 2010), and consume less alcohol (Hines et al., 2010). However, similar to overall risk for breast cancer, prevalence of these and other risk factors has also been shown to vary by level of acculturation (John et al., 2005; Keegan et al., 2010; Nodora et al., 2014).

The concept of acculturation is commonly used to explain differences in risk profiles for various chronic diseases, including cancer, among immigrant populations living in the United States. The process of acculturating to a host country's cultural practices, traditions, and values has been reported to influence both positive and negative behavioral change (Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005; Morales, Lara, Kington, Valdez, & Escarce, 2002). In general, as individuals become more acculturated, their health behaviors more closely resemble those of the host country than those of their country of origin (Broesch & Hadley, 2012; Cabassa, 2003; Thomson & Hoffman-Goetz, 2009). Several authors have criticized acculturation models because of the potential confounding by socioeconomic status (SES), including education (Abraido-Lanza, Armbrister, Florez, & Aguirre, 2006; Cabassa, 2003; Carter-Pokras & Bethune, 2009). Despite these criticisms, few published articles assessing acculturation have accounted for SES or education in their analyses.

This study aims to describe and compare distributions of behavioral risk factors and family history of breast cancer along a cultural continuum. More specifically, we compare prevalence of risk factors among women residing in Mexico and Mexican-American (MA) women in the United States categorized into one of three levels of language acculturation while controlling for education.

Materials and Methods

Study Design and Participants

The data used in this study are part of the *Ella* Binational Breast Cancer study, a collaborative effort among three sites in Mexico and two in the United States. Detailed methods for the *Ella* Study have been previously published (Martínez et al., 2010). Briefly, eligible participants were female, 18 years of age or older, self-identified as being of Mexican descent (U.S. participants), and diagnosed with invasive breast cancer 24 months before study enrollment. Participants with in situ and/or recurrent breast cancer diagnoses were ineligible. A total of 1,201 women participated in the study—581 Mexican and 620 MA women. All participants provided written informed consent in their preferred language (English or Spanish). Institutional review board (IRB) approval was obtained from each of the participating institutions. Approval for the use and analyses of the *Ella* Study data for the current research was obtained from the University of California, San Diego, and San Diego State University IRBs.

Data Collection

A risk factor questionnaire was administered to the participants and completed in their language of choice, Spanish or English. Data collection ran continuously from March 2007 through June 2011. The majority of the questionnaires were administered in person by a trained research assistant (93%); the remainder (7% at the MD Anderson site only) were completed over the phone. Risk factors relevant to our analysis included BMI, waist circumference, physical activity, alcohol consumption, cigarette smoking, and family history. Age at diagnosis and education were also collected and served as covariates in the analyses. Education was the only SES variable collected in this study.

Physical measurements to assess obesity included BMI and waist circumference. Participants were asked to report their current height and weight in the year before diagnosis. BMI was calculated via height (m) and weight (kg) variables using the formula kg/m^2 . If height or weight were missing from the questionnaire, primarily owing to woman's lack of knowledge regarding one or both, values were obtained from medical records; otherwise they were classified as missing ($n = 122$). BMI was categorized into four groups according to World Health Organization standards (World Health Organization, 2000), as follows: underweight, less than 18.5; normal, 18.5 to 24.9; overweight, 25.0 to 29.9; and obese, 30.0 or greater. For our analyses, the first three BMI groups ($\text{BMI} < 30$) were combined into a nonobese category and compared with the obese group (≥ 30.0). Waist circumference was measured in centimeters by placing the tape measure between the ribs and the top of the iliac crest of the participant. Values were then categorized into two groups according to risk of developing obesity-related metabolic disorder using the guidelines proposed by the National Heart, Lung and Blood Institute, where a value of 88.9 cm or less was considered to be high waist circumference for women (National Heart, Lung and Blood Institute, 2014). There were 212 missing values for waist circumference, 84 of these owing to phone interview questionnaire administration and the remainder to logistical issues in conducting measurements.

Education categories included completing less than or some high school, high school or the GED test, or post high school education. Owing to small number of current smokers (5%),

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