COMMENTARY

WILEY The Breast Journal

# Factors associated with breast cancer in an Argentine city

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In Argentina, breast cancer is the most commonly diagnosed cancer and the first leading cause of cancer deaths[1]; this information is mainly based on estimations since only recently, Argentina has organized a National Registry of Tumors.[2]

Argentine studies addressing socioeconomic factors and their possible effect on breast cancer prevalence are scarce, and there is not any systematic action to prevent and control breast cancer as well.[3] The aim of this study was to explore the relationship among socioeconomic factors, breast cancer risk factors, women's adherence to mammography screening, and breast cancer prevalence in La Plata, the capital city of Buenos Aires Province (Argentina), an administrative and University city.

We performed a cross-sectional study of women with low socioeconomic power (low group, LG) and a middle group (MG) from October 2012 to December 2012; 739 women between 45 and 79 years old were personally interviewed, being 360 (MG) and 379 (LG). A structured questionnaire previously validated was employed.[4] Variables included were as follows: socioeconomic group, breast cancer risk and socioeconomic factors, mammographic screening parameters, ever diagnosed breast cancer, Physician Enrollment, and Health System which consists of three sectors: Public (free), Private, and Social/Union Security.

Statistical analysis included chi-squared and Kendall's tau-b tests, ANOVA or Pearson correlation, principal component analysis (PCA), and Regression procedures, which included Logistic Binary and Ordinal Regressions.

Tables 1 and 2 summarize risk and socioeconomic factors and breast cancer mammogram screening rates, respectively.

Univariate analysis among variables showed that University women had less number of children, presented a lower rate of breastfeeding, had a high rate of mammographic screening, first mammogram <40 years old, and performed their mammograms every year. They had a high rate of Union Insurance and of Physician Enrollment with a significant difference with respect to women without a University degree.

There were 36 women (4.2%) diagnosed with breast cancer; MG had the highest percentage with a significant difference; in MG, a significant association of breast cancer with age, menopausal status, hormonal replacement, and family history was found as well as with a high frequency of mammograms and early age of first mammogram. LG women did not show any of those associations except for a higher number of cases among those who attended to a Physician who had a high frequency of mammograms.

The PCA identified two principal components which accounted for 32% of the total variation in the model (Figure S1); this analysis showed that the social groups were clearly separated (Figure S2).

Employing the Logistic Regression, age was the only variable statistically related to breast cancer: odds ratio (OR) of 1.067 (1.000-1.137) for each year of age. The Ordinal Regression showed that the educational level, marital status, breast cancer, Health System and Physician Enrollment were statistically associated with the frequency of mammograms. Low educational level was associated with low rate of mammograms; OR for women with primary education: 0.320 (0.178-0.778) and with secondary level: 0.406 (0.219-0.753), compared with University women. Married/in couple women showed a high rate of mammograms: OR of 1.950 (1.290-2.948). Having breast cancer was associated with a high rate of mammograms (OR of 8.846, 1.966-39.805) while women who attended the Public hospitals had a low rate of mammograms, OR 0.600 (0.369-0.973) and those who had a Physician had a high frequency of mammograms, OR of 4.697 (3.053-7.221).

**TABLE 1** Risk and socioeconomic factors

| Characteristics/Category | Total | LG | MG |
|---|---|---|---|
| Age ($\bar{X}$ [SD]) | 53.69 (7.69) | 54.03 (7.43) | 53.33 (7.96) |
| Age at menarche ($\bar{X}$ [SD]) | 12.85 (2.24) | 12.91 (2.05) | 12.79 (2.42) |
| Age at menopause ($\bar{X}$ [SD])* | 46.98 (5.25) | 46.32 (5.29) | 47.73 (5.11) |
| Hormonal replacement therapy (% positive/total) | 12.4 | 10.8 | 14.2 |
| BMI (kg/m$^2$; $\bar{X}$ [SD])* | 26.56 (5.23) | 27.84 (5.70) | 25.19 (4.28) |
| Height (m; $\bar{X}$ [SD])* | 1.62 (0.07) | 1.60 (0.07) | 1.62 (0.06) |
| Weight (kg; $\bar{X}$ [SD])* | 68.69 (13.79) | 71.32 (14.95) | 65.90 (11.84) |
| Number of children ($\bar{X}$ (SD))* | 2.82 (1.97) | 3.44 (2.09) | 2.16 (1.59) |
| Ever breastfed (% positive/total) | 81.0 | 84.0 | 78.5 |
| Months of breastfeeding ($\bar{X}$ [SD])* | 24.99 (26.09) | 32.70 (29.22) | 16.36 (18.66) |
| Family history of breast cancer (% positive/total) | 9.9 | 8.8 | 11.0 |
| Current smoker (% positive/total) | 32.6 | 31.1 | 34.2 |
| Current alcohol drinker** (% positive/total) | 13.9 | 5.3 | 23.1 |
| Marital status (%) | | | |
|     Married/Couple | 55.7 | 52.9 | 58.7 |
|     Other (Single, divorced, widow) | 44.3 | 47.1 | 41.3 |
| Occupation (%)** | | | |
|     House keepers | 34.9 | 57.2 | 8.0 |
|     Working outside home | 65.1 | 42.8 | 92.0 |
| Educational level (%)*** | | | |
|     Primary | 28.6 | 50.3 | 5.8 |
|     Secondary | 35.1 | 37.8 | 32.3 |
|     Tertiary | 7.1 | 6.3 | 7.8 |
|     University | 29.2 | 5.6 | 54.0 |
| Insurance type (%)** | | | |
|     Public | 31.7 | 57.3 | 4.5 |
|     Union, Social/Private | 42.7 | 42.7 | 90.7 |
| Physician Enrollment (%)** | | | |
|     Yes | 68.7 | 58.8 | 79.2 |
|     No | 31.3 | 41.2 | 20.8 |

LG, low group; MG, middle group.

*$P < 0.05$ ANOVA test.

**$P < 0.05$ Chi-squared test.

***$P < 0.05$ Kendall tau.

This research highlights the heterogeneity which may be found in a Latin American city. It appears that, although crucial, data obtained of national registries would not be sufficient to plan governmental specific prevention and early diagnosis programs.

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## REFERENCES

1. Ferlay J, Soerjomataram I, Ervik M, et al. *GLOBOCAN 2012 v1.0*, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. http://globocan.iarc.fr. Accessed March 4, 2017.
2. RITA Instituto Nacional del Cáncer. http://www.msal.gov.ar/inc/epidemiologia-y-registros/rita/. Accessed May 25, 2017.
3. Viniegra M, Paolino M, Arrossi S. Cáncer de mama en Argentina: organización, cobertura y calidad de las acciones de prevención y control. Representación OPS/OMS Argentina; 2010. http://iris.paho.org/xmlui/handle/123456789/5527. Accessed May 14, 2017.
4. Cermignani L, Alberdi C, Demichelis S, et al. Features related to breast cancer in an entire argentine rural population. *Anticancer Res.* 2014;34:5537-5542.

**TABLE 2** Breast cancer mammogram screening rates

| Characteristic | Category | Total | LG | MG |
|---|---|---|---|---|
| Ever performed mammogram (%)* | Yes | 86.5 | 78.1 | 95.3 |
| | No | 13.5 | 21.9 | 4.7 |
| Years since last mammogram (%)* | Less than 2 yr | 75.2 | 62.9 | 86.3 |
| | More than 2 yr | 24.8 | 37.1 | 13.7 |
| Frequency of mammograms (%)** | Never | 15.1 | 26.1 | 4.7 |
| | More than 2 yr | 11.6 | 14.5 | 8.8 |
| | Every 2 yr | 11.0 | 9.1 | 12.7 |
| | Every year | 62.4 | 50.3 | 73.7 |
| Age at first mammogram (%)** | <40 yr | 48.3 | 31.7 | 62.4 |
| | 40-50 yr | 46.4 | 60.1 | 34.7 |
| | >50 yr | 5.3 | 8.2 | 2.9 |

LG, low group; MG, middle group.
*$P < 0.05$ Chi-squared test.
**$P < 0.05$ Kendall $t$ test.

## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.