

Features Related To Breast Cancer in an Entire Argentine Rural Population

LUCIANO CERMIGNANI¹, CECILIO ALBERDI¹, SANDRA DEMICHELIS², LUCIANA FERNÁNDEZ³,
MARCELA M. MARTINUCCI⁴, NESTOR ZALAZAR³, MARCELA MÁRQUEZ^{5,6},
AMADA SEGAL-EIRAS¹ and MARÍA VIRGINIA CROCE¹

¹*Centro de Investigaciones Inmunológicas Básicas y Aplicadas, Facultad de Ciencias Médicas, Universidad Nacional de La Plata, La Plata, Argentina;*

²*Universidad de Lanús, Lanús, Argentina;*

³*Secretaría de Salud, Saladillo, Lanús, Argentina;*

⁴*Hospital Zonal "Dr. Posadas", Saladillo, Lanús, Argentina;*

⁵*Karolinska Institutet, Stockholm, Sweden;*

⁶*School of Medicine, Universidad Autónoma de Nuevo León, Monterrey N.L., Mexico*

Abstract. *Aim: A descriptive study was developed in an entire Argentine rural community considering breast cancer risk factors, preventive strategies and breast cancer incidence. Patients and Methods: the study comprised of 83 women. A questionnaire of 34 items was employed; a mammogram and a breast ultrasound were performed. ANOVA and Pearson correlation were employed. Results: Mean age was 54.5 years; 69% of women were postmenopausal; 96% had children; breastfeeding was $X=10$ months/child; Body Mass Index (BMI) was $X=27.8$ kg/m²; 13% had first-degree relatives with breast cancer; 90% of women considered mammographic screening a necessary study. One woman had presented breast cancer. Argentine screening guidelines were not followed and an inverse relationship between education level and age of first mammogram was found ($p<0.05$). Mammographic and ultrasound studies did not reveal potential abnormalities. Conclusion: Peculiar social and cultural characteristics may be relevant to evaluate breast cancer risk factors in Argentina.*

Cancer incidence varies around the globe, especially between developed and less-developed regions. Demographic,

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Correspondence to: Prof. María Virginia Croce, MD, Centro de Investigaciones Inmunológicas Básicas y Aplicadas, Facultad de Ciencias Médicas, Universidad Nacional de La Plata, La Plata, Argentina. Calle 60 y 120 1900 La Plata, Argentina. Tel: +54 2214236711 (int. 342), e-mail: crocevir@hotmail.com

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ecological, environmental, social, cultural and genetic variables contributed to the heterogeneity of cancer incidence. Unfortunately, little information is available about cancer in the majority of less developed countries (1).

It has been estimated that in Argentina, 17,000 new cases of breast cancer are diagnosed each year and it is the commonest cause of cancer death in women reaching 5,400 deaths per year, which is the second rate of mortality in Latin America after Uruguay (1).

Multiple factors are associated to an increased risk of developing breast cancer, including age, family history, exposure to female reproductive hormones (both endogenous and exogenous), diet, overweight and obesity, life style and environmental factors, benign breast disease, breast density and reproductive history (2).

In the absence of effective primary prevention measures, screening and early detection of breast cancer have been important tools to reduce the mortality rate and prolong a patient's life (3). In developed countries, the 5-year survival rate of early breast cancer has ascended to nearly 95%, while the prognosis of advanced patients is poor with the survival rate less than 30% (4). In some Latin-American countries, it a low adherence to mammographic has been observed screening, which has been also detected in Latin women living in foreign countries (5). The US Preventive Task Force recommends biennial screening mammography for women 50 to 74 years old (<http://www.uspreventiveservice.staskforce.org/uspstf/uspbrca.htm>), while the American Cancer Society recommends that average risk women should begin annual mammogram at the age of 40 (<http://www.cancer.org/healthy/findcancerearly/cancerscreeningguidelines>). The Argentine Consensus for Breast Cancer Prevention recommends a first mammogram at 35 years of age and, if it is negative, another one at 40 and continue with

biennial mammographic screening during healthy life (www.samas.org.ar).

Since markedly different patterns of cancer by region have been detected, it is recommended that priorities for cancer must be developed at a regional, national or even local level (6). Worldwide, most reports include breast cancer patients, and studies on healthy women are scarce.

The present research was developed to: (i) study risk factors related to breast cancer; (ii) study socio-cultural attitudes and behaviors in relation to mammographic screening and (iii) describe breast cancer incidence in an entire rural community of Argentina.

Patients and Methods

Patients. A descriptive study from November 2012 to January 2013 was performed in Polvaredas, Provincia of Buenos Aires. A striking feature of this study is that the sample comprises the entire female population (83) from 40 to 75 years old.

After obtaining an informed consent from women, they were personally interviewed within two weeks by social workers using a structured questionnaire based on Terán et al. (5). Thirty four items that characterized subjects were evaluated. Aspects of information included demographic, healthcare behaviors, anthropometric, breast cancer personal and family history, reproductive history, personal habits, information about breast cancer and preventive strategies, health system, hormone replacement therapy.

A month after the questionnaire was performed, a mammogram and, eventually, an ultrasound study, were obtained. In the case of women who had a mammogram during a year previous to the study, the mammogram and the informed results were achieved.

The study protocol and questionnaire were approved by the local Ethical Committee. Procedures followed the World Medical Association Declaration of Helsinki (Finland, 1964) and further modifications.

Data analysis. A descriptive analysis was performed and normality of variables was verified. Differences among groups were studied employing ANOVA HSD Tukey; association among variables were studied by means of χ^2 test ($p < 0.05$).

Results

Characteristics of the village. Polvaredas is a rural community placed in the centre of the Provincia of Buenos Aires, 185 km away from the city of Buenos Aires. The population is composed of 390 inhabitants being of Italian and Spanish descent. The economic activity is based on agriculture and cattle farming. Most houses have a vegetable garden and beef and chicken are mainly farm-raised; diet is organically grown. There are no fast food restaurants. Facilities are limited; there is not wastewater service treatment in the village but fresh drinking water is obtained from potable wells in each house. There is electric power service and gas, used to cook and heat water, available in tanks or cylinders.

Table I. Risk factors associated with breast cancer.

Characteristics	Categories	% (n=83)
Age (years)	40-49	37.4 (31)
	50-59	28.9 (24)
	60-69	28.9 (24)
	70-75	4.8 (4)
Body Mass Index (BMI) (kg/m ²)	19-24,99	30.1 (25)
	25-29,99	38.5 (32)
	30-34,99	27.7 (23)
	≥35	3.6 (3)
Breast cancer	Yes	1.2 (1)
	No	98.8 (82)
Family history (n=29, 35%) (mother or sister)	First degree	38 (32)
	Other	62 (51)
Current use of hormonal replacement therapy (HRT)	Yes	7.2 (6)
	No	92.8 (77)
Number of births	0	4.8 (4)
	1-3	81.9 (68)
	4-6	12.1 (10)
	>7	1.2 (1)
	Ever breastfed	Yes
Months of breastfeeding	No	16.8 (14)
	0	16.9 (14)
	1-12	28.9 (24)
	12-24	26.5 (22)
	24-36	13.3 (11)
Menarche (age)	>36	14.4 (12)
	<10	6.0 (5)
	10-14	86.7 (72)
Menopause (age) (n=54, 65.1%)	>14	7.3 (6)
	<45	16.7 (9)
	45-55	79.6 (43)
Smoking habit	>55	3.7 (2)
	<10 packs/year	100 (100)
Alcohol intake	>10 packs/year	0
	<5 g/day	100 (100)
	>5 g/day	0

There is only one health Unit with a general practitioner in charge 3 days per week.

Risk factors associated with breast cancer (Table I). More than 90% of women were between 40 and 65 years old (mean age=54.5 years). The mean Body Mass Index (BMI) was 27.8 kg/m² (range=19.8 a 36.7), 31.3% of women were obese, although 90% corresponded to type I obesity, while 13% had first-degree family history of breast cancer.

Only one woman had a previous diagnosis of breast cancer. She was diagnosed and treated at the age of 35; she had her menarche at 9 years of age and her menopause at 35 years. She has one son, breastfed 2 months, and had her grandmother and another relative with breast cancer. At the moment of the survey she was 52 years old and her BMI was 26.11; she had a general practitioner at the Public Health System who prescribed a mammogram every two years. She

Table II. *Socio-economic characteristics.*

Characteristics	Categories	% (n=83)
Marital Status	Married or in couple	72.2 (60)
	Single	3.6 (3)
	Divorced	9.6 (8)
	Widow	14.4 (12)
Occupation	Housekeepers	77.1 (64)
	Workers	21.6 (18)
	Unemployed	1.2 (1)
Income	Sufficient	73.4 (61)
	Insufficient	26.5 (22)
Insurance type	Union/Private Health Insurance	80.7 (67)
	Free Public Health System	19.2 (16)
Education (n=82)	Primary incomplete	20.7 (17)
	Primary complete	41.4 (34)
	Secondary incomplete	3.6 (3)
	Secondary complete	24.3 (20)
	High/Superior	9.7 (8)

finished the secondary school, was married, lived as a housekeeper, and considered her family income sufficient, and felt that she had enough information about breast cancer and mammographic screening.

Most women (79/83, 95%) had one or more children, mean=2.4 children per woman, reaching a maximum of 10 children (one woman). Most women (82%) breastfed (65% of them for at least 12 months); only 14 women did not breastfeed, 4 because they had no children.

In relation to toxic habits, smoking and alcohol intake were evaluated; all women declared that they had smoked less than 10 packs per year and had drunk less than 5 g/day of alcohol or had not drunk at all.

Socio-economical characteristics (Table II). Sixty women were married or in union and 63 women were housekeepers. Women subjectively evaluated their income as “sufficient” or “insufficient” and 73.5% considered that it was “sufficient”. Taking into account the “education”, 28 women had at least finished the Secondary School. When educational level was correlated with age, it was found that younger women had a higher educational level (statistical tendency, although not significant, $p<0.05$).

The Health Care System was evaluated in relation to have any type of insurance (Union, Private) or not, and 81% had insurance while 19% employed the free Public Health System.

Attitudes towards breast cancer and mammogram screening

Mammographic screening history. Sixty seven women (81%) had a previous mammogram in respect to our research; almost 50% had her first mammogram before 40 years old while 42% between 40 and 50 years old and 8% after 50

Table III. *Information about breast cancer and mammographic screening.*

Characteristics	Categories	% (n=83)
Have you read something about breast cancer?	Yes, a lot	66.2 (55)
	Some	2.4 (2)
	Occasionally	27.7 (23)
Do you feel you are informed about breast cancer?	Never	3.6 (3)
	Yes	67.4 (56)
	Some	24.1 (20)
Do you think that breast cancer is curable if it is detected at early stages of the disease?	No	8.4 (7)
	Yes	92.7 (77)
	No	1.2 (1)
Do you think the mammogram is necessary?	I don't know	6
	Yes	92.7 (77)
	No	7.2 (6)

Table IV. *Mammographic characteristics obtained from 66 women.*

Characteristics	Number	
Breast type	Fibro-glandular	62
	Fibro-nodular	1
	Fibro-lipomatous	3
Nodules	Yes	54
	No	12
Anarchic microcalcifications	Yes	0
	No	66
Axillary lymph nodes	Not present	18
	Unspecific	24
	Suspicious	3
Bi-rads	0	18
	1	26
	2	22
	>3	0

years old. Nearly 62% of women had their last mammogram less than two years ago with respect to our survey.

A significant relationship ($p<0.05$) between age and the first mammographic study was found, older women began their control later. Women with low educational level began their mammographic studies later.

Information about breast cancer and mammographic screening.

As it is shown in Table III, 93% of women considered mammographic screening a necessary study for early diagnosis of breast cancer while sixty seven percent considered that they had enough information about breast cancer.

Interest about follow-up and prevention. Women were asked about the information which they considered important to be included in the mammographic report. Most women would appreciate information about mammogram procedures and

results (83%, n=69) and also about breast cancer (81%, n=67). An interesting observation was that 78% of women would like to receive a phone call alerting them about the proximity of the mammographic study date. Only 6 women would appreciate a web page and only 2 extra information. Finally, forty seven women (57%) had a regular primary care physician.

Mammographic screening.

It was possible to evaluate the mammograms of 66 out of 83 women; in 57/66 women a new mammogram was obtained during this study. The other nine women had a mammographic screening during the year previous to the survey and they showed their mammogram along with the report. All studies were evaluated by the same specialist.

The following data were evaluated: type of breast, presence of nodules, anarchic microcalcifications, armpits, Bi-rads (Breast Imaging Report and Database System), other characteristics (Table IV).

In 23 women, an ultrasound was prescribed; in 20 to complete their mammographic study, while in the other 3 the mammogram was not possible because of anatomical characteristics of the breasts and/or the presence of breast implants; in any case, no abnormality was found.

The mammographic study was related with data obtained with the questionnaire; in this sense, a comparative analysis between two groups (with and without mammographic study) was performed and there was not any significant difference ($p < 0.05$).

Discussion

A population-based research in an entire Argentine village was performed to obtain accurate data in relation to breast cancer preventive strategies and epidemiological features. Polvaredas was chosen because it is one of many similar villages in the Provincia of Buenos Aires which have some typical characteristics of small rural communities; because there is not any cancer registry, and also because public officers considered the study very important and actively contributed with it.

It has been stated (6) that cancer risk factors and cancer registries reveal geographical heterogeneity and temporal trends that generate different etiological hypotheses. It is known that cancer registries are lacking or are inadequate in many countries, especially in developing regions (6).

Having a family history of breast cancer, particularly women with mother or sister or daughter who has or had breast cancer may double the risk (7). In Polvaredas only one woman had breast cancer, while nearly 13% had first-degree relatives, which is in accordance with global figures (7).

In the village, hormonal replacement therapy was unfrequently found; at present, long-term use has been

associated with the highest risk and also it appears to depend on the menopausal status of women (8). It is considered that nulliparous women are at increased risk for breast cancer compared with parous women (relative risk from 1,2 to 1,7) (9); Polvaredas' study showed that less than 5% of women were nulliparous. In relation to breastfeeding, more than 80% of Polvaredas' women breastfed compared to 41%, which is the Provincia of Buenos Aires general median (www.msal.gov.ar). Furthermore, nearly 65% of Polvaredas' women breastfed 12 months or more with a mean value of about 10 months compared to 8.9 months in the Provincia of Buenos Aires. A protective effect of breastfeeding has been shown in multiple studies, the magnitude of which depends on the duration of breastfeeding (10). A large pooled analysis that included individual data from 47 epidemiologic studies (more than 146,000 women between cases and controls) estimated that for every 12 months of breastfeeding there was a 4,3% reduction in the relative risk of breast cancer (10).

Differences between general Argentine and Polvaredas figures are also found in relation to alcohol consumption and tobacco smoking since in the village a very low intake was detected, while national tendencies show a different scale. In relation to tobacco smoking, 23.9% and 15.9% of Argentine men and women smoke, respectively (www.healthmetricsandevaluation.org), while no woman in Polvaredas smoke more than 10 packs per year. Although results have varied widely, multiple studies suggest there is a modestly increased risk of breast cancer in smokers (11), although others have not (12). A 2013 meta-analysis of 110 epidemiological studies showed a small but significant association between female breast cancer and light alcohol intake (RR 1.05, 95% confidence interval (CI): 1.02-1.08) (13). In this sense, Polvaredas' woman alcohol consumption did not exceed 5 g/day.

Obesity (defined BMI ≥ 30 kg/m²) is associated with an overall increase in morbidity and mortality. However, the risk of breast cancer associated with BMI appears to depend on the menopausal status of women. A higher BMI and/or weight gain have been consistently associated with a higher risk of breast cancer among post-menopausal women (14); although, recent studies found that obesity increases mortality risks in young breast cancer women. More than 27% of the Argentine women have excess weight (www.msal.gov.ar); a similar figure was found in Polvaredas (30%).

Screening mammography is the primary imaging modality for early detection of breast cancer because it is the only method of breast imaging that consistently has been found to decrease breast cancer-related mortality (15). Mammography may detect cancer one and a half to four years before a cancer becomes clinically evident (16). In this study cohort, 62% of women >40 years had a mammographic screening two years before the survey, which is higher than the Argentine general figure (54.2%) and also the provincia of Buenos Aires figure

(56.3%) (www.msal.gov.ar, 2011). In any case, the Argentine women follow the indications of the Argentine Consensus (www.samas.org.ar). In the village, 80% had a mammographic study and only 32.5% had performed their first mammogram before the age of 40 years. In relation to education, which also indicates socio-economic status (17), categories of educational attainment were created: incomplete primary school, complete primary school, incomplete secondary school, complete secondary school, and High/Superior. In Argentina, primary education amounts to 6 years of schooling, and secondary education amounts to a further 6 years of schooling. At Polvaredas, a higher attendance to mammographic study before reaching the age of 40 years was found among women who had higher educational level. In addition, about 80% of Polvaredas' women had Union or Private Insurance; more than 70% considered sufficient their income, while 57% had a general practitioner.

An interesting feature was that at Polvaredas, almost all women considered the mammography necessary and breast cancer curable if it is detected early; furthermore, most women considered that they were informed about breast cancer while more than 75% would like to receive a phone call alerting to the proximity of mammographic control.

Reasons why some regions have lower incidence of breast cancer than others need continued survey; we have found that educational differences play a role. Furthermore, Polvaredas showed some special features such as most women were married or in union, had children and breastfed, had health insurance, considered sufficient their income, their diet did not include fast food, and live in a quiet, rural place. Modifiable risk factors in this small community would include weight and physical activity.

We only recruited participants from one village but many similar communities rely on the same safety health situation; it is probable that women in other geographical Argentine areas have different characteristics. While there are limitations to our research, they do not undermine the fact that it is the first one performed in Argentina and, to our knowledge, in Latin America.

We conclude that lifestyle, family support as well as the positive inclination to health care of these rural women may help to improve early detection of breast cancer and a simple preventive strategy would easily be organized.

Conflicts of Interest

The Authors declare that they have no financial relationship that may lead to a conflict of interest in relation to the submitted manuscript.

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