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DIAGNOSIS OF BREAST CANCER THROUGH THE TECHNIQUE OF MAMMOGRAPHY AND THERMOGRAPHY IN WOMEN ATTENDING THE GENERAL HOSPITAL OF CHILPANCINGO, GUERRERO

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Abstract: The objective of this research was to estimate the prevalence of breast cancer using the Thermography and Mammography technique, and risk factors in women attending the General Hospital. **Material and methods:** The women were invited to participate in a breast cancer screening campaign. A risk factor questionnaire was applied, those that were suspicious were referred to the oncologist.
Results: The average age was 42.46 ± 10.45 SD, with a range of 17 to 74 years. A 2% prevalence of breast cancer was estimated. The most frequent risk and/or protective factors were: obesity, sedentary lifestyle, breastfeeding, nulliparity, among others. **Conclusion**: The prevalence of breast cancer was 2%. The risk and/or protective factors found are those reported in the literature. The use of thermography is recommended as a complementary test to mammography.
Keywords: Breast cancer, thermography, cancer diagnosis.

INTRODUCTION

In Mexico, breast cancer is a public health problem that mainly affects women regardless of socioeconomic level (Aguilar-Cordero et al. 2011). During 2017, deaths from breast cancer have been registered from 15 years of age, but the largest number of cases were registered in the group of 65 years and over with 2410 cases, in the group of 55 to 64 years (1753 cases) and of 45 to 54 years (1638 cases) (INEGI, 2018). In the state of Guerrero, a prevalence of breast cancer of 29.2% has been reported (Reyna-Sevilla et al. 2016).

The most common risk factors associated with the development of cancer are: family history of breast cancer, reproductive factors associated with prolonged exposure to endogenous estrogens, early menarche, late menopause, having the first childbirth after the age of 30, the use of oral contraceptives,

hormone replacement treatments, obesity, not exercising, not breastfeeding, consumption of alcoholic beverages and tobacco, exposure to pesticides, among other factors (Santamaria-Ulloa, 2009; Páez-Esteban et al. 2010, Cuenca et al. 2013).

According to Lazcano et al. (2016) 30% of deaths related to cancer (any type of cancer) are due to five modifiable risk factors, including behavioral and dietary elements, such as: high body mass index, low consumption of fruits and vegetables, lack of physical activity, tobacco and alcohol consumption.

In Mexico, the Official Mexican Standard NOM-041-SSA2-2011 mentions that, for the diagnosis of breast cancer, three detection measures must be carried out: self-examination, clinical breast examination and mammography. The first must be promoted in women from the age of 20; clinical examination at 25 years of age and mammography from 40 to 69 years of age, every two years. In women older than 70 years, mammography is performed under medical indication, depending on their hereditary family history of breast cancer.

Another technique recently used for the detection of breast problems is thermography, it is a fast, economical, practical, reliable and non-invasive screening technique that through a thermographic camera can capture the image of the breast, this study can show a variation in body temperature that indicates the presence of a tumor that is not yet large enough to be detected by physical exams, mammograms, or other types of diagnostics (Ruiz et al., 2013). Breast thermography is based on two reasons: cancer cells multiply and grow very quickly, in a cancerous tumor blood flow and metabolism increase, and by increasing these, the skin temperature rises (Breastcancer.Org 2012).

According to the American Cancer Society (2017), the goal of breast cancer screening is to find it before symptoms start (feel for a small lump). Therefore, early detection means finding and diagnosing a disease before the person has symptoms.

It is important to mention that although thermography for the study of breast cancer is not included in the Mexican Standard, it has been used because it has the advantage of not using ionizing radiation and it can be used in young women of any age. age for the detection of a breast pathology (Pérez et al. 2014).

The objective of this research is to estimate the prevalence of breast cancer in women who attend consultation at the Dr. Raymundo Abarca Alarcón General Hospital; as well as the most frequent risk and/or protective factors in the women participating in this study.

METHOD DESCRIPTION

The present investigation is of an observational, cross-sectional and retrospective type, it was carried out at the General Hospital "Dr. Raymundo Abarca Alarcón" in the city of Chilpancingo, Guerrero, Mexico. Sampling was non-probabilistic (for convenience). Women were invited through the radio, newspaper and leaflets to participate in a breast cancer screening campaign. The women who participated come from 32 towns in the state of Guerrero. The women who agreed to participate in the study signed a letter of informed consent. It must be noted that a pilot test was previously carried out with 20 volunteers. The women who participated were given written instructions for breast measurement, such as: do not touch the breasts at the time of sample collection, do not apply deodorant to the armpits on the day of measurement, do not apply perfume, and powder on the chest and not wear jewelry. These requirements are essential in order not to alter the results of the thermograms.

Before taking the reading with the

thermographic camera, the patient was allowed to rest for approximately 10 minutes. During this period of time, a questionnaire containing questions related to some risk factors for breast cancer was applied, height and weight were also measured. weight. Subsequently, the woman was told the positions in which the breast measurements would be made. After the indications, we proceeded to place it in front of the thermographic camera at a distance of one meter. 6 thermograms were taken. The area where the measurements were made had a temperature of 25 to 26°C.

PROCEDURE FOR TAKING THERMOGRAMS

The first image was taken facing the breasts, the second turning the patient slightly to the right, the third turning slightly to the left. Two other images were taken by bringing the camera closer to each of the breasts at a distance of approximately 50 cm, and the last image was taken from the front, focusing on the two breasts at a distance of one meter. Once the thermography was performed, the patient was referred to the X-ray area, to perform the mammography. The patients who were found to have any breast pathology were referred to the Hospital gynecologist for treatment and those who were positive were referred to the oncologist. Data capture was performed in Epi-data and statistical analysis in Stata version 9.1. Each of the variables was analyzed. The diagnosis of breast cancer was taken as the dependent variable and each of the risk factors (age, BMI, breastfeeding, menopause, menarche, exposure to pesticides, among others) as the independent variable. Percentages, means, standard deviations were calculated. Confidence intervals were estimated at 95%.

RESULTS

GENERAL CHARACTERISTICS OF THE WOMEN WHO PARTICIPATED IN THE STUDY

In this study, 206 women participated and they come from 32 towns in the state of Guerrero. The average age of the participants was 42.46 ± 10.45 SD, with a range of 17 to 74 years. Most of the women presented obesity (54.6%), 17% overweight, 26.9% normal weight and 1.5% underweight. Of the four women diagnosed with breast cancer, two are obese, one overweight and one underweight. 30.10% are sedentary and 69.90% (144/206) exercise frequently or almost always. 1.94% consume alcoholic beverages frequently. In relation to tobacco consumption, 2.4% smoke, and 97.6% do not smoke. Of the 4 women diagnosed with breast cancer, none consumed alcohol or smoked. In relation to the consumption of fruits and vegetables, 18% of women have never consumed fruits and vegetables throughout their lives.

A total of 22.3% (46/206) of the women reported suffering from diseases, the most frequent being arterial hypertension (n=23), diabetes (n=16), hypertriglyceridemia (n=3), rheumatoid arthritis (n=3) and The less frequent diseases were: asthma, vitiligo, cardiovascular problems, hypercholesterolemia, kidney problems, Hodgkin's lymphoma, fibroadenoma of the left breast, breast cyst, and chronic anemia. It must be noted that some women presented from one to three different diseases. 77.7% (160/206) reported not having any disease.

FAMILY HISTORY OF BREAST CANCER

5.3% have a family history of breast cancer (mother, sisters, grandmother and aunt) and 2% mentioned other types of cancer. It must be noted that 4 women with breast cancer reported having no family history of breast cancer.

GYNECOLOGY AND OBSTETRIC HISTORY

Regarding the onset of menstruation, 28.16% had menarche at 12 years and 71.84% after 12 years. Women with breast cancer experienced menarche after the age of 12. 37.86% (78/206) are premenopausal and 62.14% (128/206) are menopausal, of these 4.85% had a late menopause. Of the 4 women with cancer, two were menopausal and two were premenopausal. 11% of the women who participated in this study are nulliparous. 13.59% of the participants did not breastfeed their children and 86.41% did breastfeed; 72.82% breastfed for more than 6 months. It must be noted that the 4 women with breast cancer breastfed their children from 8 to 20 months.

EXPOSURE TO TOXIC

Most women are exposed to pesticides, since 72.33% reported using pesticides to control pests at home, the pesticides with the highest frequency of use were Baygón (28%), proxur and ficaw applied by the health sector in the houses (19.90%), raidoliths (34.95%), oko (7.3%), raid-max (7%), H24 (4.4%). Of the 4 women with breast cancer, three mentioned that they apply pesticides in the area where they live.

EXAMINATION OF THE BREASTS, SIGNS AND SYMPTOMS REPORTED BY WOMEN

74.76% of women perform self-examination of the breasts and 25.24% do not self-examine. 67.5% present signs and symptoms in their breasts such as pain, lumps, burning, itching, hardness, itches, inflammation, and pus discharge, and 32.5% have not presented any signs and/or symptoms. Of the 4 women with breast cancer, three patients had pain in the right breast and one in the left breast. The symptoms reported by these patients are: pain, lumps, and inflammation in the affected breast.

DIAGNOSTIC MAMMOGRAPHY AND THERMOGRAPHY

Using the mammography technique, 201 diagnoses were made, and 4 women had a positive diagnosis of breast cancer. Therefore, the prevalence of breast cancer was 2% (201/4) (Table 1).

Birads	Interpretation	n	Percentage
1	Normal	6	2.98
2	Benign findings	142	70.64
3	Probably benign	45	22.38
4	Probably malign	5	2.49
5	Malign	3	1.49
Total		201	100.00

Table 1. Diagnosis of breast cancer by mammography

The following mammography and thermography images (Figure A and B) show the breasts of a positive patient for breast cancer. It must be noted that the two images correspond to the same person.

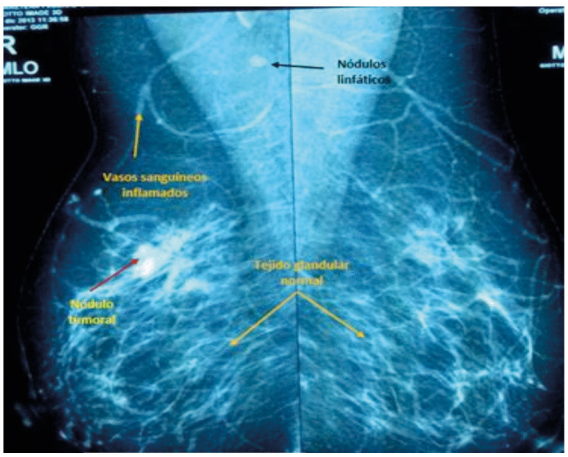

Figura A

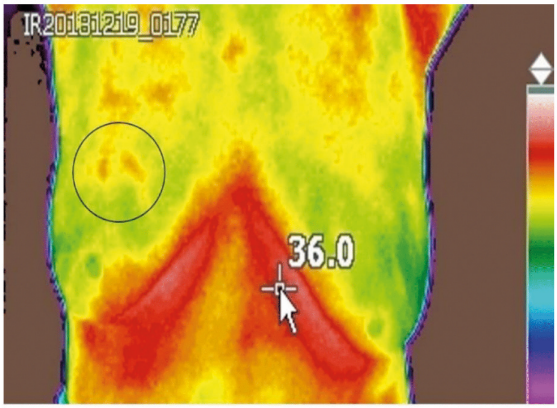

Figura B

In figure A, Mammography (Birads 5), obliquely, the blood vessels are observed in the upper right breast, in the lower part of the right breast the tumor nodule is observed and most of it is glandular tissue. normal. The lesion located in the upper quadrant of the right breast is observed, with remnant or scarce glandular tissue, the lesion is of high density, irregular morphology, spiculated edges and apparently with satellite lesions, in addition there is some distortion of the architecture.

In figure B, the thermographic examination shows a vascular asymmetry in the right sinus compared to the left, and a focus of hyperthermia at 12:00 hrs in the right sinus.

In the presumptive diagnosis of breast cancer, through breast thermography, a general mean of the thermal score of 2.41 (95% CI: 2.27, 2.55) was obtained. 54.23% of the participants had a normal thermal score (less than 2.5) and 41.77% presented an abnormal result.

DISCUSSION

The prevalence of breast cancer in the present study was 2%, however, more than half of the women (67.5%) present signs and symptoms in their breasts such as: pain, lumps, burning, itching, hardness, itches, inflammation, and discharge of pus; and this could be the beginning of the clinical manifestations of the neoplasia in the mammary tissue. It must be noted that in Mexico it is estimated that the incidence and mortality from breast cancer continues to increase due to population aging, changes in reproductive patterns, and problems for immediate access to medical care, resulting in delays in early diagnosis and treatment. timely treatment (Maycotte et al., 2020). Also in other countries such as England they have reported an increase in breast cancer in the last five years (Palmieri, et al 2022).

In our study, 5.3% of the participants reported having a family history of breast cancer; this result was lower than that reported by López-Sánchez et al, (2019) who report 11.22%.

Another risk factor is not breastfeeding their children and in our study 13.59% of the participants did not breastfeed. According to Maycotte et al (2020) for every 12 months of breastfeeding, the risk of breast cancer decreases by 4% (RR = 0.04)

54.6% of the women who participated have obesity, this being a risk factor for breast cancer, as mentioned by Milena-Bedoya et al (2019) in a review of the literature in which they report that in a population of women of Shanghai found an association between obesity and breast cancer (OR= 10.3 95% CI 2.4-43.8). Other researchers also report the

same risk factor (Rivera-Ledesma et al., 2019; Contreras-García et al., 2020). It is worth mentioning that, in our study, of the four women diagnosed with breast cancer, two presented obesity.

For many years it has been shown that excess adipose tissue in menopausal women with central obesity is generally related to the risk of suffering from breast cancer, an observation accepted by several groups of researchers (Oliva-Anaya et al 2015).

75% of the women who participated in the study reported performing breast self-examination, being a habit that could detect any abnormality in the breasts; as mentioned by Ozorio-Bazar et al (2020) in which they recommend breast self-examination, since it allows the determination of anomalies that may correspond to the initial clinical manifestations of the neoplasia.

Regarding the use of thermography, it is recommended only as a complementary technique to mammography for the detection of breast cancer.

CONCLUSIONS

A 2% prevalence of breast cancer was estimated in a population of women from 32 towns in the state of Guerrero. The age range of women with a positive diagnosis of breast cancer was 42 to 65 years. The most frequent risk and/or protective factors found in the participating women were: obesity (54.6%), exposure to pesticides (72.33%), breastfeeding (86.41%), sedentary lifestyle (30.1%), not breastfeeding the baby (13.59%), nulliparity (11%), family history of breast cancer (5.3%) and late menopause (4.85%). The use of thermography is recommended as a complementary test to mammography.

RECOMMENDATION

More than half of the women reported having presented signs and symptoms in their breasts such as: pain, lumps, burning, itching, hardness, itching, inflammation, and discharge of pus from their breasts; therefore, it is necessary to follow up this population to prevent a late diagnosis of breast cancer in the future.

In the state of Guerrero, the detection of breast cancer in most cases is diagnosed in late stages, for this reason it is necessary to use other technologies that allow early detection at low cost and non-invasive such as infrared thermography, since the The Secretary of Health in our state does not have enough equipment (mastographs) to care for the entire population at risk.

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