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PATTERNS OF BREAST DENSITY IN COLOMBIAN WOMEN: SIMILAR OR DIFFERENT TO THE NORTH AMERICAN AND MEXICAN POPULATION?

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KEYWORDS :

Summary

The evaluation of breast density in mammography is essential, because it determines the sensitivity of the study for detecting lesions and influences the risk of the patient to develop breast cancer. Traditionally it has been determined by qualitative evaluation with the visual method, assigning a classification according to the amount of fibroglandular tissue and fatty tissue in the breast, as stipulated in the BIRADS according to the North American population.An evaluation of the types of breast density was carried out in the population of a specialized in women imaging diagnostic center in Bogotá, Colombia, and it was compared with the distribution percentages described in the BIRADS and in another Latin American population studied. It was found that in the Colombian population more than 65% of women have non-dense breast tissue (types A and B), and approximately 35% have dense breast; the last one being the group of patients who would benefit from supplemental ultrasound. The distribution percentages are similar to those described in the Mexican population and differ from those described in the BIRADS, which suggests that the Latin American population in general could behave like this.

Breast density

Breast density is defined as the amount of fibroglandular tissue visible on mammography. At present, it is widely known that high breast density not only reduces the sensitivity of mammography for the detection of lesions, but also represents an independent risk factor for the development of breast cancer, for which this group of patients benefits from complementary ultrasound (1,2,3). However, this additional behavior generates higher costs to the health system and can even generate more anxiety for patients. For this reason, in recent years, multiple methods have been explored for density quantification and classification, in order to do so in an objective and reproducible way that allows detecting these patients with higher risk so that they can be screened accordingly (2,3).

The most widely known and used method to date is the visual method, initially described in the third edition of BIRADS (1994) and updated in the fifth and latest edition (2013), which classifies breast tissue into 4 types (Fig. 1): A) almost entirely fatty, B) scattered fibroglandular tissue, C) heterogeneously dense tissue, and D) extremely dense tissue (4). With this in mind, there are 2 large groups to consider; patients with non-dense breasts which include those with type A and B breast density, corresponding to 50%, and patients with dense breasts where those with type C and D breast density are included, corresponding to the other 50%; the latter considered as the highest risk group that benefits from additional study (3,4).

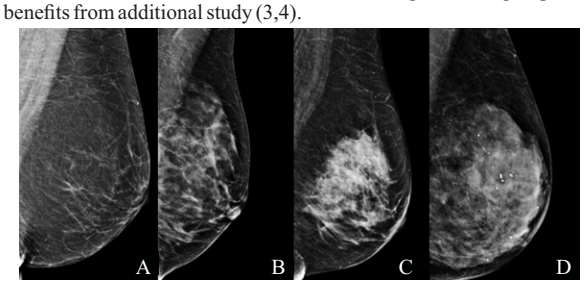

Fig. 1. Visual classification of breast tissue according to BIRADS.

A)almost entirely fatty, B)scattered fibroglandular, C) heterogeneously dense, and D) extremely dense.

These distribution percentages of the types of breast density determined in BIRADS have been studied and interpreted only according to data from the North American population. Taking into account that the Latin American population is very different and variable, it is considered of great importance and contribution to determine the distribution of these same percentages in it, an exercise that has only been carried out in a sample of the Mexican population (5).

OBJECTIVE

To know the distribution of the types of breast density in the population of a specialized in women imaging diagnostic center in Bogotá, Colombia, and to compare it with the distribution percentages described in the BIRADS and in another Latin American population studied (Mexico).

METHODS

A total of 10,376 mammograms performed in the period 01/01/2019 – 30/06/2020, from women between 20 and 92 years old were included, regardless of the indication. In the context of University Hospital, each mammogram had a double reading where the type of breast density was assigned initially by a radiology resident (third / fourth year) or by a fellow, which was later reviewed and validated by one of 4 radiologists - breast experts with experience between 11 and 25 years.

A univariate analysis of the frequency distribution was performed for each mammographic pattern of breast density based on the number of cases and the percentage, to later compare it with that described in the literature.

RESULTS:

A total of 10,376 direct digital mammograms with tomosynthesis, which met all the quality criteria established in the specialized diagnostic center (accredited by the American College of Radiology) were evaluated.

The age range evaluated was from 20 to 92 years, with a mean age of 58.2 years. Of the total mammograms studied, 11.48% (1192) were classified as type A breast density, 57.63% (5980) as type B, 28.37% (2944) as type C and 2.5% (260) as type D. For types A + B, corresponding to non-dense breasts, we found a total of 69.11%, while for types C + D, corresponding to dense breasts, there was a total of 30.87%.

According to the age distribution, type A breast density was found in women between 36 and 89 years old with a mean of 63 years; type B density in a range from 26 to 92 years with a mean of 57 years; type C density in the range of 26 to 90 years with a mean of 51 years; and type D density in the group aged 20 to 87 years with a mean of 46 years.

Most of the women were found in two large age groups: 30.5% of patients in the 40-50 age group, and 33.3% of patients in the 50-60 age group. For the 40-50 age group, 3.37% (107) women were classified as

type A breast density, 48.31% (1533) as type B, 43.11% (1368) as type C and 5.2% (165) as type D. For the group aged 50 to 60 years, 10.75% (372) women were classified as type A, 61.39% (2123) as type B, 26.43% (914) as type C and 1.42% (49) as type D.

Table 1. Distribution percentages of the types of breast density for the different studied populations.

	Colombia	BIRADS	Mexico
A (almost entirely fatty)	11.48%	10%	11.3%
B (scattered fibroglandular)	57.63%	40%	64.8%
C (heterogeneously dense)	28.37%	40%	20%
D (extremely dense)	2.5%	10%	3.9%
Non-dense (A+B)	69.11%	50%	76.1%
Dense (C+D)	30.87%	50%	23.9%
TOTAL	10.376	-	2.000

DISCUSSION

In the Colombian population studied, as in the North American and Mexican population, the types of fibroglandular and heterogeneously dense breast tissue predominated. However, there is an important difference in its distribution, since a predominance of fibroglandular tissue was found, which exceeded 57%, as in the Mexican population; unlike the North American population where it only reaches 40%. Regarding the heterogeneously dense tissue, the percentage was much lower for Colombian and Mexican women compared to North American women, with values of 28.37%, 20% and 40% respectively. The almost entirely fatty and extremely dense types had the lowest percentages. The first showed values very similar to those of the other two populations studied, while the second was similar to that found in the Mexican population, but it barely represents a quarter of what was described in the North American population.

As mentioned above, as described in the BIRADS, patients with dense breasts who would benefit from complementary ultrasound correspond to 50% of the North American population, and patients with non-dense breasts the other 50%. Taking into account the findings of the present study, this group of patients with dense breasts (types C + D), at higher risk, is much lower in our population where it represents 30.87%, a finding similar to that described in the Mexican population where it is also much less. In turn, the group of patients with non-dense breasts (types A + B) predominates in both Latin American populations, where it exceeds 65%, as opposed to the 50% described in the North American population.

Most of the women were found in two large age groups: 40 to 50 years and 50 to 60 years. In both groups, as in the general study population, fibroglandular and heterogeneously dense tissues predominated. In addition, a higher percentage of patients with non-dense breasts was found than with dense breasts (51.68% vs 48.31% for the first group and 72.14% vs 27.85% for the second group). However, in the group of patients aged 50 to 60 years, the percentages were higher for the groups with almost entirely fatty and fibroglandular tissue, than for the groups with heterogeneous and extremely dense tissue. These findings indicate that in the group of patients aged 40 to 50 years, in whom there is a higher percentage of dense breasts compared to the group aged 50 to 60 years, it is where patients would benefit the most from an ultrasound supplement for screening.

CONCLUSIONS:

In the Colombian population, more than 65% of women have non-dense breast tissue (types A + B), which is associated with a lower risk for the development of cancer and makes mammography a study with excellent sensitivity for the detection of lesions. However, 30% of the population are patients with dense breasts, which increases the risk of developing breast cancer and decreases the sensitivity of mammography, which is why they benefit from complementary ultrasound. The findings of the study are relevant because they show a difference of 20% in this group of patients at higher risk compared to that described in the North American population. These findings are very similar to those described in a Mexican population, which suggests that the Latin American population in general could behave this way and opens the possibility of studies in other similar populations to generate more specific recommendations.

When evaluating the two predominant age groups, it was found that in the 40 to 50-year-old group there is a higher percentage of women with dense breasts (types C + D), so this group of patients would be the ones who would benefit the most from complementary ultrasound to screening mammography.

Future directions

Taking into account the importance of breast density and its influence on the sensitivity of mammography, as well as the existing intra and interobserver variability, a way to determine it in a more objective way has been sought with the implementation of specialized software. In our institution, density has been estimated in this way during the last year and it seeks to determine its correlation with the visual method, to identify new findings.

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