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Risk Factors Associated with Benign and Malignant Breast Pathology, From 40 to 69 Years of Age

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Summary

Benign and malignant breast pathology are alterations in the breast tissue that respond to several factors interacting with each other, generating abnormalities in the breast, with breast cancer being the main malignant pathology. The risk factors present for breast pathology have been studied.

Objective: To determine the risk factors associated with benign and malignant breast pathology from 40 to 69 years of age.

Methods: A comparative, observational, cross-sectional, ambispective study was conducted at UMF 55. A total of 326 women aged 40 to 69 years with mammography interpretation from the last 2 years were included, studying risk factors (intake of oral contraceptives, alcohol consumption, smoking, sedentary lifestyle, breastfeeding and obesity). A bivariate analysis was performed for dichotomous variables compared to the presence of breast pathology, using Chi-square, and for nutritional status, Mann-Whitney U was used. Statistical significance was defined with a value of $p \leq 0.05$.

Results: It was found that obesity occurred in 46.3% and smoking in 26.1% of cases. 18.7% reported consuming alcohol, 72.4% reported having practiced breastfeeding and 33.1% did physical exercise. 22.2% consumed oral hormones, the BIRADS 2 classification was the most frequent with 71.5% of the cases, with breast pathology in 17.5% of the patients.

Conclusion: A significant association was found between smoking and the presence of breast pathology ($p=0.041$), however, for the variables oral hormone consumption, alcohol consumption, breastfeeding, physical exercise and obesity with the presence of breast pathology, no significant association was found ($p>0.05$).

Keywords: Breast pathology; Risk factors; BIRADS classification

Introduction

Benign breast pathology is defined as a group of alterations in breast tissue which respond to hormonal mechanisms, external factors, such as lifestyle, nutritional habits, interacting with each other and that constitute a heterogeneous group of lesions that include developmental abnormalities, inflammatory lesions, epithelial and stromal proliferations, which have an association for the development of breast cancer, which include: palpable mass, mastalgia, nodularity, and cysts [1-3].

The importance of a deep understanding and knowledge about benign breast pathology is of great importance since it generates relief of attributable symptoms when this is possible, they can be identified in a timely manner and in turn know the patient's history that may predispose her to a significant risk of cancer; as well as the distinction of benign from malignant pathology in a timely manner [4].

As for malignant breast pathology, breast cancer is the main exponent and is defined as the abnormal and disordered growth of cells of the epithelium of the breast ducts or lobules, which has the ability to spread. According to the World Health Organization (WHO), breast cancer is the most common neoplasm in women worldwide, representing 16% of all female cancers, which is why it is important to highlight its study, prevalence and prevention.

Mammography, as a screening method, plays an important role in the early detection of breast pathology, however, there are points of controversy that include the absence of consensus regarding the age at which it should be started, the appropriate interval between two screenings, the age at which it should be suspended, and the value of the method as screening in young women at high risk for cancer development [5]. The BI-RADS (Breast Imaging-Reporting and Data System) system is being used in health units and consists of seven stages (0-6), which are described as:

BI-RADS 0: Inconclusive due to incomplete reading.

BI-RADS 1: Normal breast.

BI-RADS 2: Benign (probability of cancer similar to the general population).

BI-RADS 3: Probably benign findings. (<2% risk of malignancy).

BI-RADS 4: Probably malignant (positive predictive value for cancer between 29-34% to 70%).

BI-RADS 5: Highly suggestive of malignancy (PPV for cancer greater than 70%).

BI-RADS 6- Malignancy confirmed histologically, but before starting definitive treatment.

Mammography should be annual in asymptomatic women from 40 years of age to 69 years of age, since this measure has been shown to reduce mortality and is applied worldwide [3].

Women with dense breasts according to the BI-RADS classification had an increased risk of breast cancer, increasing the risk and odds ratio of breast cancer among women with dense

breast (heterogeneous and extremely dense breast) was 1.9 (95% confidence interval, 1.3-2.8) compared to women with fatty breasts. followed by factors such as body mass index, age at menarche, age at menopause, age at first delivery, number of live births, use of oral contraceptives, family history of breast cancer, previous breast procedures and use of hormone replacement therapy, considered as factors that are related to the presence of benign and malignant breast pathology [6-10].

A history of benign breast diseases can be developed by several risk factors which can be non-modifiable or modifiable, among the non-modifiable can be included menarche and genetic factors such as age, race, family history of breast cancer and personal history of benign breast diseases, while among the modifiable risk factors we have diet, smoking, alcohol consumption, sedentary lifestyle, overweight or obesity, non-breastfeeding [11, 12].

Our objective is to determine the risk factors associated with benign and malignant breast pathology, from 40 to 69 years of age, since in our country breast cancer is an important public health problem, due to the constant increase in incidence and mortality values.

Materials and Methods

A comparative, observational, cross-sectional, ambispective study was carried out in the Family Medicine Unit (UMF) 55. A total of 326 women aged 40 to 69 years who underwent mammography in the last 2 years and who had a mammogram interpretation report were included, the associated factors that were studied are: intake of oral contraceptives, alcohol consumption, smoking, sedentary lifestyle, breastfeeding and obesity. For the bivariate analysis for the variables smoking, alcohol consumption, exercise, use of oral hormones (dichotomous) compared to the presence of breast pathology (dichotomous), the chi-square test was used, while for nutritional status (ordinal) the Mann-Whitney U test was used. Statistical significance was defined with a value of $p \leq 0.05$.

Results

Information from 326 women whose median age was 53 years was analyzed, with an interquartile range of 25, 75 (IQR 25.75) of 52.15 and 53.77 years, respectively.

Within the anthropometric measurements, it was observed that the median weight of the patients is 70.3 kg with an IQR of 25, 75 of 70.00, 73.08 kg respectively, with respect to height the median is 1.53 meters with an IQR of 25 of 1.52 meters and an IQR of 75 of 1.54 meters, on the other hand the median body mass index (BMI) is 29.53 with an IQR of 25, 75 of 29.72, 30.92 kg/m2 respectively.

In nutritional status, it was found that 46.3% (151) of the participants were in the obesity group, while 40.2% (131) were overweight and only 13.5% (44) were of normal weight.

Regarding the presence of breast pathology, it was observed that 17.5% (57) of the participants were present with breast pathology compared to 82.5% (269) of patients who were without the presence of breast pathology (Figure 1, Table 1).

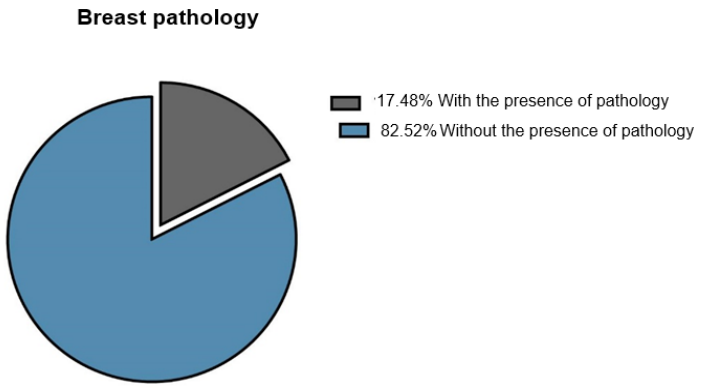

Figure 1: Diagram of sectors with the presence of breast pathology in women aged 40 to 69 years.

Variable	N (326) N (%)
Age (years)[a]	53 (52.15,53.77)
Weight (kg)[a]	70.3 (70.00,73.08)
Size (meters)[a]	1.53 (1.52,1.54)
Body mass index (kg/m^2)[a]	29.53 (29.72,30.92)
Nutritional status[b]	
Normal	44 (13.5)
Overweight	131 (40.2)
Obesity	151 (46.3)
Smoking	
Yes	85 (26.1)
No	241 (73.9)
Alcohol use[b]	
Yes	61(18.7)
No	265 (81.3)
Breastfeeding[b]	
Yes	236 (72.4)
No	90 (27.6)
Physical exercise[b]	
Yes	108 (33.1)
No	218 (66.9)
Use of hormonal methods[b]	
Yes	69 (21.2)
No	257 (78.8)
Birads classification[b]	

Birads 0	28 (8.6)
Birads 1	35 (10.7)
Birads 2	233 (71.5)
Birads 3	13 (4.0)
Birads 4	16 (4.9)
Birads 5	1 (0.3)
Breast pathology[b]	
With the presence of pathology	57 (17.5)
No presence of pathology	269 (82.5)
[a] Median and interquartile range 25.75 [b] Frequencies and percentages	

Table 1: Sociodemographic characteristics of women aged 40 to 69 years.

According to the risk factors, it was observed that 26.1% (85) of the participating women reported smoking, while 73.9% (241) did not smoke (Figure 2), on the other hand, 18.7% (61) reported consuming alcohol and 81.3% (265) did not consume alcohol, with respect to breastfeeding was practiced by 72.4% (236). Moreover, 27.6% (90) did not breastfeed, in contrast to the patients who perform physical exercise, 33.1% (108) reported physical exercise and 66.9% (218) did not, on the other hand, the use of hormonal methods was observed that 21.2% (69) reported using hormonal methods and 78.8% (257) did not use it.

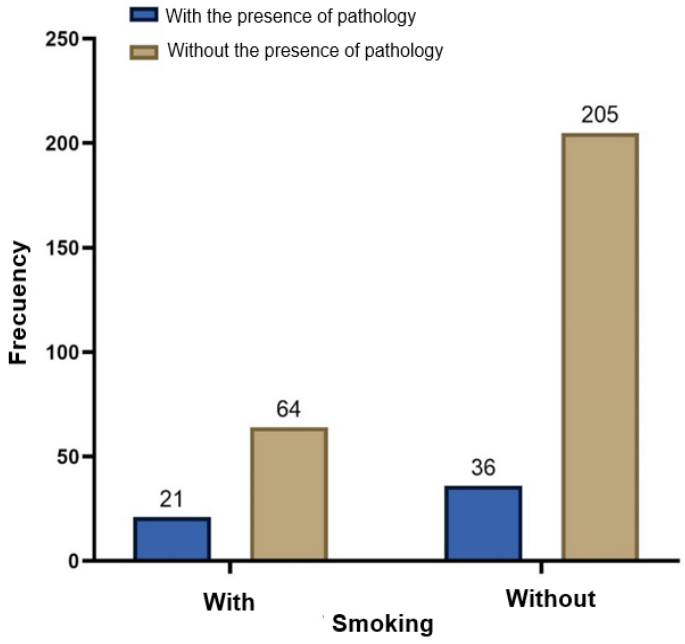

Figure 2: Distribution of smoking consumption with the presence of breast pathology.

The BIRADS classification showed a higher frequency of the BIRADS 2 group with 71.5% (233) of the cases, followed by BIRADS 1 with 10.7% (35) and BIRADS 0 with 8.6% (28) of the cases, i.e., 90.8% of the participants were classified in BIRADS 0, 1 and 2, while the remaining 9.2% were classified in BIRADS 3, 4 or 5.

Next, the comparative analysis of the sociodemographic variables by smoking habit was carried out, observing that 85 women (26.1) smoked compared to 241 women (73.9) who did not report this habit. The age of the women was analyzed, observing that there was no difference in the median age, the median age reported was 53 years, with a IQR of 25.75 for women with smoking between 47 and 58 years, while women without smoking registered an IQR of 25.75 for women aged 47 to 59 years (p=0.965).

With respect to weight, it is observed that the difference between patients with smoking is 1 kg compared to patients without smoking, reporting a median weight of 71 kg with an IQR 25.75 of 63.40.79.25 and an IQR 25.75 of 64.40.79 for those who do not smoke (0.895).

The height of the women was analyzed, observing that there was no difference in the medians of age, the median height reported was 1.53 meters, with a IQR of 25.75 for women with smoking of 1.50 to 1.57 meters, while women without smoking registered an IQR of 25.75 from 1.49 to 1.57 years (p=0.507).

Regarding body mass index, there was a difference of 0.21 kg/m2 compared to patients without smoking, reporting a median of 29.47 with a IQR 25.75 of 27.05, 32.66, and a median of 29.68 with a IQR 25.75 of 26.56, 33.27 for those who did not smoke (p=0.931).

Of the nutritional status groups with and without the presence of tobacco consumption; In the group of women with tobacco use, the most frequent nutritional status was obesity with 27.2% (41), followed by the normal group and the nutritional status of overweight with 31.8% and 22.9%, respectively, with overweight being the most frequent in patients without smoking in 77.1% (101) and in a lesser proportion in obesity and normal nutritional status in 72.8% and 68.2% respectively (p=0.990).

Regarding alcohol consumption, the percentage of women who did consume alcohol within the group of women with smoking was 60.7% (37), which is similar to the percentage of women without smoking, which was 39.3% (24) (p= <0.001).

It was observed that, within the group of women with breastfeeding and tobacco consumption, 25% (59) had it compared to women who were not breastfed and 75% (177) without tobacco consumption (p=0.475).

In terms of physical exercise, the percentage of women who did not exercise within the group of women with smoking is lower than the group of women without smoking at 75%. (p=0.966).

Regarding the use of hormonal methods, the percentage of patients who did use within the group of women with smoking was 22 (31.9), with a difference of 25 patients compared to those who did use hormonal methods and smoked, in contrast to those who did not use hormonal methods, with a difference of 131 patients who did not smoke, 194 (75.5) (p=0.216).

Finally, in the cross-referencing of the BIRADS classification with the presence of breast pathology, it was observed that while in the group of women with smoking the most frequent BIRADS classification was BIRADS 2 with 25.3% (59), in the group of women without smoking this percentage was 74.7% (174). No statistically significant association was found between the BIRADS classification and tobacco consumption (p=0.172) (Table 2).

Qualitative variables	**With smoking** n=85 n= (26.1%)	**Smoke-free** n=241 n=(73.9%)	**Statistical test**
Age (years)[a]	53 (47,58)	53 (47,59)	0.965*
Weight (kg)[a]	71 (63.40,79.25)	70 (64.40,79)	0.895*
Size (meters)[a]	1.53 (1.50,1.57)	1.53 (1.49,1.57)	0.507*
Body mass index (kg/m2)[a]	29.47 (27.05,32.66)	29.68 (26.56,33.27)	0.931*
Nutritional status[b]			
Normal	14 (31.8)	30 (68.2)	
Overweight	30 (22.9)	101 (77.1)	0.990*
Obesity	41 (27.2)	110 (72.8)	
Alcohol use[b]			
Yes	37 (60.7)	24 (39.3)	**<0.001***
No	48 (18.1)	217 (81.9)	
Breastfeeding[b]			
Yes	59 (25)	177 (75)	0.475**
No	26 (28.9)	64 (71.1)	
Physical exercise[b]			
Yes	28 (25.9)	80 (74.1)	0.966**
No	57 (26.1)	161 (73.9)	
Use of hormonal methods[b]			
Yes	22 (31.9)	47 (68.1)	0.216**
No	63 (24.5)	194 (75.5)	
Birads classification[b]			
Birads 0	10 (35.7)	18 (64.3)	
Birads 1	4 (11.4)	31 (88.6)	
Birads 2	59 (25.3)	174 (74.7)	
Birads 3	4 (30.8)	9 (69.2)	0.172*

Birads 4	7 (43.8)	9 (56.3)	
Birads 5	1 (100)	0 (0)	
[a]Median and interquartile range 25.75 [b]Frequencies and percentages			
Bold: **Significant result** *Mann-Whitney U **Xi Square			

Table 2: Comparison of the sociodemographic characteristics of women aged 40 to 69 years by the presence of smoking.

Bivariate analysis of the presence of pathology and without the presence of pathology was performed with the different risk factors, with a frequency of 61 patients who present a lower presence of breast pathology with the use of oral hormonal methods compared to those who do not use them, with a total of 208 patients p of 0.147, being statistically not significant (Table 3).

Qualitative variables	**With the presence of pathology n= 57 n (%)**	**No presence of pathology n= 269 n (%)**	**OR**	**95% CI**	**Statistical test**
With oral hormones	8(11.6)	61 (88.4)	0.557	(0.255, 1.24)	0.147**
No oral hormones	49 (19.1)	208 (80.9)			
With alcohol consumption	11 (18)	50 (82)	1.047	(0.51, 2.17)	0.901**
No alcohol consumption	46 (17.4)	219 (82.6)			
With smoking	21 (24.7)	64 (75.3)	1.868	(1.02, 3.43)	**0.041****
Smoke-free	36 (14.9)	205 (85.1)			
Breastfeeding	46 (19.5)	190 (80.5)	1.739	(0.86, 3.53)	0.122**
No breastfeeding	11 (12.2)	79 (87.8)			
With physical exercise	16 (14.8)	92 (85.2)	0.751	(0.40, 1.41)	0.372**
No physical exercise	41 (18.8)	177 (81.2)			
Obese	23 (15.2)	128 (84.8)	1.342	(0.75, 2.40)	0.320**
No obesity	34 (19.4)	141 (80.6)			

Table 3: Analysis of the factors associated with smoking in women aged 40 to 69 years associated with benign and malignant breast pathology.

Discussion

The present research aimed to identify the risk factors associated with benign and malignant breast pathology in women aged 40 to 69 years at the Family Medicine Unit 55 (FMU 55). The results obtained provide a detailed overview of the demographic and health characteristics of the population studied, allowing comparison with the existing literature.

In terms of demographic characteristics, the median age of 53 years reflects a predominantly postmenopausal female. This finding is consistent with previous studies that suggest an increase in the incidence of breast pathology with age. The prevalence of obesity of 46.3% in our sample is also consistent with the global trend of increasing obesity and its association with an increased risk of breast cancer.

Smoking, reported by 26.1% of the participants, emerged as a factor of interest. Although the literature supports the association between smoking and breast cancer, it should be noted that the relationship between these two factors is complex and may depend on other elements, such as the duration of smoking and the amount of tobacco consumed. In our comparison by smoking, it was found that demographic and health variables, such as age, weight, height, and BMI, did not differ significantly between smokers and non-smokers, which is consistent with some studies that do not find a direct association between these variables and smoking.

The proportion of alcohol consumption was significantly lower in non-smoking patients compared to smokers ($p<0.001$). This inverse relationship between smoking and alcohol consumption may have important implications, as both factors are known to be associated with breast cancer.

Regarding the factors associated with breast pathology, the analysis revealed that the consumption of oral hormones alcohol consumption, breastfeeding25, physical exercise17 and obesity did not show a significant association with the presence of breast pathology ($p>0.05$). However, a significant association was found between smoking and the presence of breast pathology ($p=0.041$), which is consistent with previous studies that have pointed to smoking as a risk factor for breast disease.

It is crucial to note that this study has limitations, and the results should be interpreted considering the specific context of the population studied. Variability in results between different studies may be due to differences in methodology, study population, and other contextual factors. Despite these limitations, the findings provide a valuable basis for future research and prevention strategies in the field of breast pathology in the FMU 55.

Conclusion

In the present study, it was found that the probation studied had a median age of 53 years, weight of 70.3 kg, height of 1.53 m and BMI of 29.5 kg/m2. Obesity occurred in 46.3% of cases, while smoking was reported in 26.1%. 18.7% reported consuming alcohol, while 72.4% reported having practiced breastfeeding and 33.1% did physical exercise. 22.2% of the patients indicated the consumption of oral hormones. The most frequent category of the Birads classification was 2 with 71.5% of the cases, and breast pathology occurred in 17.5% of the patients.

In the comparison by smoking, it was found that age, weight, height and BMI were similar between patients with and without smoking ($p>0.05$), likewise, the proportion of patients with obesity, breastfeeding, physical exercise and oral hormones was similar between patients with smoking and without smoking ($p>0.05$). However, the proportion of patients with alcohol consumption was lower in women without smoking compared to women with smoking ($p<0.001$).

Regarding the analysis of the factors associated with breast pathology, a significant association was found between smoking and the presence of breast pathology ($p=0.041$) and no significant association was found between the consumption of oral hormones, alcohol consumption, breastfeeding, physical exercise and obesity with the presence of breast pathology ($p>0.05$).

References

1. Fernández T Ángel, Reigosa Y Aldo. (2015). Riesgo de cáncer de mama en mujeres con patología mamaria benigna. Comunidad y Salud. 13: 78-86.
2. Miltenburg DM, Speights VO Jr. (2008). Benign breast disease. Obstet Gynecol Clin North Am. 35: 285-300.
3. Ernesto MGS, Manuel CCH, Luis GB. (2013). Patología benigna mamaria en pacientes del Servicio de Ginecología Oncológica del Hospital Nacional Arzobispo Loayza. Rev. peru. ginecol. obstet. 59: 157-160.
4. GRP. (2016). Diagnóstico y Tratamiento de la Patología Mamaria Benigna en primer y segundo nivel de atención. Guía de Referencia Rápida. Instituto Mexicano del Seguro Social. México. 2016.
5. Aibar L, Santalla A, López-Criado MS, González-Pérez I, Calderón MA, et al. (2011). Clasificación radiológica y manejo de las lesiones mamarias. Clin Invest Gin Obst. 38: 141-149.
6. Kim S, Tran TXM, Song H, Ryu S, Chang Y. (2022). Mammographic Breast Density, Benign Breast Disease, and Subsequent Breast Cancer Risk in 3.9 Million Korean Women. Radiology. 304: 534-541.
7. Tesic V, Kolaric B, Znaor A, Kuna SK, Brkljacic B. (2013). Mammographic density and estimation of breast cancer risk in intermediate risk population. Breast J. 19: 71-8.
8. Dai H, Yan Y, Wang P, Liu P, Cao Y, et al. (2014). Distribution of mammographic density and its influential factors among Chinese women. Int J Epidemiol. 43: 1240-1251.
9. Shamsi U, Afzal S, Shamsi A, Azam I, Callen D. (2021). Factors associated with mammographic breast density among women in Karachi Pakistan. BMC Womens Health. 21: 438.
10. Hanis TM, Arifin WN, Haron J, Wan Abdul Rahman WF, Ruhaiyem NIR, et al. (2022). Factors Influencing Mammographic Density in Asian Women: A Retrospective Cohort Study in the Northeast Region of Peninsular Malaysia. Diagnostics (Basel). 12: 860.
11. Niurka OB, Claudia BH, Lianet VB. (2022). Factores de riesgo asociados al cáncer de mama. Rev Cubana Med Gen Integr. 36: e1147.
12. Noguera-Gárces C, Román-López M, Varona-Acosta A, Ameiller-Sanz D, Ocaña-Noguera J. (2017). Mortalidad por Cáncer de Mama. Policlínico 13 de Marzo. 2014-2015. MULTIMED. 20: 8.