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Different Breast Lesion Consistency in Pre- and Post-Menopausal Egyptian Women and Its Relation to Anthropometric Measurements

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ABSTRACT

Background/aim: Breast lesion differs in consistency and features between premenopausal and postmenopausal women, menopause is a significant risk factor. For breast lesions, anthropometry is one of the few risk variables that may be changed. There is an ongoing debate over the relationship between the menopausal state and obesity. It is believed to be a key factor in the development of cancer breast, which is the most common malignancy in women worldwide and the main cause of death. Fibroadenoma is thought to be one of the most prevalent types of benign breast lesions. The relationship between anthropometric measurements and the risk of breast lesions is still up for debate in the literature and is impacted by a variety of factors, including; menopause, lifestyle, ethnicity, and reproduction.
Aims of this study: Identifying breast lesions consistency; benign or malignant in pre-& post-menopausal women and finding its anthropometric measurements relation. **Subject and Methods:** This study was a prospective cross-sectional. A gynaecologist recruited 800 Egyptian women with breast lesions. Depending on whether they were menstruating, the participants were divided into two groups. Ages 30-45 for the pre-menopausal group and 45-65 for the post-menopausal group. Then, according to BMI, they were classified into three groups: normal weight (no. = 245) (130 pre-menopausal & 115 post-menopausal), overweight (no. = 265) (140 pre-menopausal & 125 post-menopausal), and obese (no. = 290) (130 pre-menopausal & 160 post-menopausal). **Results:** Both the age and the prevalence of females with a high BMI (obesity) were considerably higher in post-menopausal patients. The weight and height of the normal-weight and overweight groups had insignificant differences. The waist and hip circumferences of post-menopausal women were considerably greater than those of pre-menopausal women. There was an insignificant change at the WHR between both groups. BMI had a statistically significant negative correlation with benign breast lesions in pre-menopause women and a statistically significant positive correlation with malignant lesions in post-menopausal women. In addition, waist circumference had a statistically positive significant correlation with malignant lesion in both pre and post-menopausal women. **Conclusion:** Pre-menopausal Egyptian women were more likely to have benign breast lesions, while post-menopausal women were more likely to have malignant breast disease. The effects of obesity differ in both of them. According to this study, post-menopausal women who are obese have a higher risk of developing malignant breast lesions. A large waist circumference is also linked to an increased risk of malignant breast lesions, which highlights the significance of taking this into account.

Keywords: Breast lesion, Consistency, Menopause, Anthropometric

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1. Introduction

Breast disorders are various; most of the breast lesions are presented by many clinical manifestations, including breast pain, solid masses, and diffuse nodularity. Non-malignant lesions such as benign tumours (fibroadenoma), cysts (fibrocystic breast changes), fibroadenosis, and duct ectasia. According to McMullen *et al*. (2019), these benign lesions are typically not linked to a higher risk of cancer. Fibroadenoma accounts for 70 to 95 % of all benign breast tumours and is regarded as one of the most prevalent types of benign breast disease (Danino *et al*., 2019). The most prevalent cancer in women worldwide and the primary cause of mortality is breast cancer. It represents 5 - 10%. Over 22,000 new cases of breast cancer are detected annually in Egypt, where it accounts for 33% of all female cancer cases. By 2030, there will be more than 2 million new instances of breast cancer detected annually worldwide (Abdelaziz *et al*., 2021).

During the premenopausal period, receiving estrogen and anti-estrogen treatment has demonstrated a strong clinical association with benign breast disease. The fluctuating levels of hormones during menstruation that cause an imbalance in estrogen and progesterone contribute to the frequency of fibrocystic changes that can be seen in premenopausal women. On the other hand, postmenopausal women who had been taking oestrogens and progestins for more than eight years had a 1.7-fold higher prevalence of benign breast lesions. The combined usage of progestin and oestrogen was linked to a 74% risk of benign breast disease during the Women's Health Initiative research (WHI). The prevalence of benign proliferative breast disease decreased by 28% as a result of anti-estrogen use (Schünemann *et al*., 2020).

Many factors, such as duration of breastfeeding and higher BMI (pre-menopausal), are linked to the reduction of breast cancer risk. However, the following factors, are linked to an increased risk of breast cancer; early menarche, nulliparity, short regular menstrual cycles, use of oral contraceptives, hormone replacement therapy, older age at first birth, positive family history of breast cancer and high post-menopausal body mass index (BMI) (Emily *et al.,* 2020). Clinical examinations can be subjective, clinician-dependent, and unclear when it comes to differentiating between benign and malignant breast lesions. The triple assessment of breast lesions is more accurate than any modality used alone, even if it combines techniques such as physical examination, imaging (mammogram and ultrasound), and fine needle aspiration cytology (FNAC) (Karim *et al.,* 2020).

Therefore, determining and identifying benign and malignant breast lesions in pre-and post-menopausal women based on their anthropometric factors was the goal of the current investigation.

2. Materials and Methods

Study Design and Sampling:

This was a cross-sectional prospective study. The study comprising 800 Egyptian female patients with breast lumps recruited by a gynecologist after doing diagnostic methods. Participants were divided into two groups based on their menstrual status. Premenopausal group (age 30-45) and postmenopausal group (age 45-65). Then, according to BMI, they were classified into three groups: normal weight (no. = 245) (130 pre-menopausal & 115 post-menopausal), overweight (no. = 265) (140 pre-menopausal & 125 post-menopausal), and obese (no. = 290) (130 pre-menopausal & 160 post-menopausal).

The inclusion and exclusion criteria:

The participants were between the ages of thirty and sixty-five., including Egyptian females who had breast lumps. The participants were excluded if they were pregnant or lactating patients, patients who had hysterectomies, patients having ovarian problems, patients on contraceptive pills, or those on hormonal medication.

Clinical assessment:

- Medical history of the complaints, such as the onset & duration of symptoms, associated pain, breast swelling and/or discharge per nipple, and if there was a positive family history of malignant breast lesions.
- Dedicated clinical examination of each breast, including the skin and nipple, to detect any abnormalities such as thickened skin, retracted nipple, and diffuse inflammation; painless or painful breast lesions; and enlarged axillary lymph nodes.

Clinically, premenopausal, perimenopausal, and menopausal periods were diagnosed in accordance with the National Collaborating Centre for Women's and Children's Health (Women's NCCf, 2015), as follows:

- Women's menstrual cycles are generally normal during the premenopausal phase.
- The menopausal transition, or perimenopause phase, during which women experienced irregular menstrual cycles prior to menopause.
- A woman was considered postmenopausal if, within a year of her last period, there was no other pathological or physiological cause for it (amenorrhea and age above 45 are adequate clinical markers for the standard diagnosis of menopause).

Anthropometric measurements: Body weight and body height were taken following the recommendations of the International Biological Program (Hiernaux and Tanner, 1969). A weight was taken using the scale balance, and an anthropometer was used for assessing the height. BMI was calculated as a weight divided by a height squared (Kg/m^2). The females were subdivided according to BMI into three groups: a normal-weight group ($BMI \leq 25$ kg/m²), an overweight group ($25 \geq BMI \leq 29.9$ kg/m²), and an obese group ($BMI \geq 30$ kg/m²).

Additionally, the waist circumference (WC) was measured (the tape measure was positioned horizontally just above the iliac crest and exactly under the umbilicus), and the hip circumference (HC) was measured (the tape measure at the largest buttocks circumference). Then waist-hip ratio (WHR) was calculated after measurement of both waist and hip circumferences.

Radiological assessment

All participant patients underwent digital mammography, breast ultrasonography, and elastography.

- **Digital mammography and findings:** Using GE Healthcare digital mammography (Senographe Essential) with CEM capability. Imaging of both breasts at two views was done, the cranio-caudal (CC) and medio-lateral oblique (MLO) views. Findings as well as ill-defined opacities with indistinct margins, suspicious microcalcifications, architectural distortion, and axillary lymphadenopathy.

The interpretation of breast lesions according to the American College of Radiology (ACR) and Breast Imaging Reporting and Dated System (BIRADS) was done.

- **ACR classifications**: (A) Mostly fatty, (B) Scattered fatty breast density with few areas of fibrous & glandular tissue, (C) Heterogeneously dense breast that has more areas of fibrous and glandular tissue, and (D) Marked dense breast.

- **BIRADS classification**: (0) Need more imaging evaluation, (1) Negative, (2) Benign, (3) Probably benign, (4) Suspicious abnormality, (5) Highly suggestive of malignancy, and (6) Malignancy pathologically proved.

- **The breast ultrasonography examination and findings:** Each breast was assessed using PHILIPS, USA, with a high-frequency probe (5-12 MHz). The patient was supine and then in the lateral position. In longitudinal and transverse views, as well as both axillae, were examined to detect axillary lymph nodes. Findings: skin and subcutaneous tissue thickness, hypoechoic irregular solid soft tissue lesion with increased posterior shadowing, anechoic cystic lesion, well-defined benign-looking lesion, dilated lactiferous ducts, and enlarged axillary lymphadenopathy.

- **Breast elastography examination:** The elastography technique was performed using the same probe with split-screen technology and activating the elastography function. Gentle, sustained manual compression using a free hand was applied on the breast lesion. The region of interest (ROI) draws on the lesion and then compares it with normal breast tissue. According to the manufacturer, the hardest structures and the most deformed soft tissues were displayed in different colors. Strain elastography can assess elasticity by colors within the breast lesion and visually score according to the 4-5 scale scoring system (elasticity score). Then, semi-quantitative analysis was done based on strain ratio (SR); two regions of interest (ROIs) were manually drawn at the breast lesion and at a

normal breast tissue as a reference, and then SR was calculated by dividing the elasticity index of both.

- Fine needle aspiration cytology (FNAC) was done for suspicious patients.

Ethical consideration

The study protocol was revised and approved by the institutional review board at the Faculty of Physical Therapy, Cairo University. Ethical No: P.T.REC/012/002467. The study followed the guidelines of the Helsinki Declaration on the conduct of human research. Informed consent was obtained after explaining the aims of this study, informing them about the confidentiality of their information, and that they had the right to withdraw at any time.

Statistical Analysis: The data was analyzed using the Statistical Package for Social Sciences (SPSS/Windows Version 22, IBM Corporation). Parametric data is expressed as mean ± standard deviations (SD), while the non-parametric data (qualitative) is expressed as a frequency distribution (numbers). Chi- Square test was used to examine the association and correlation with breast lesion and obesity using r: Spearman correlation coefficient, $P < 0.05$ (a Statistical significance).

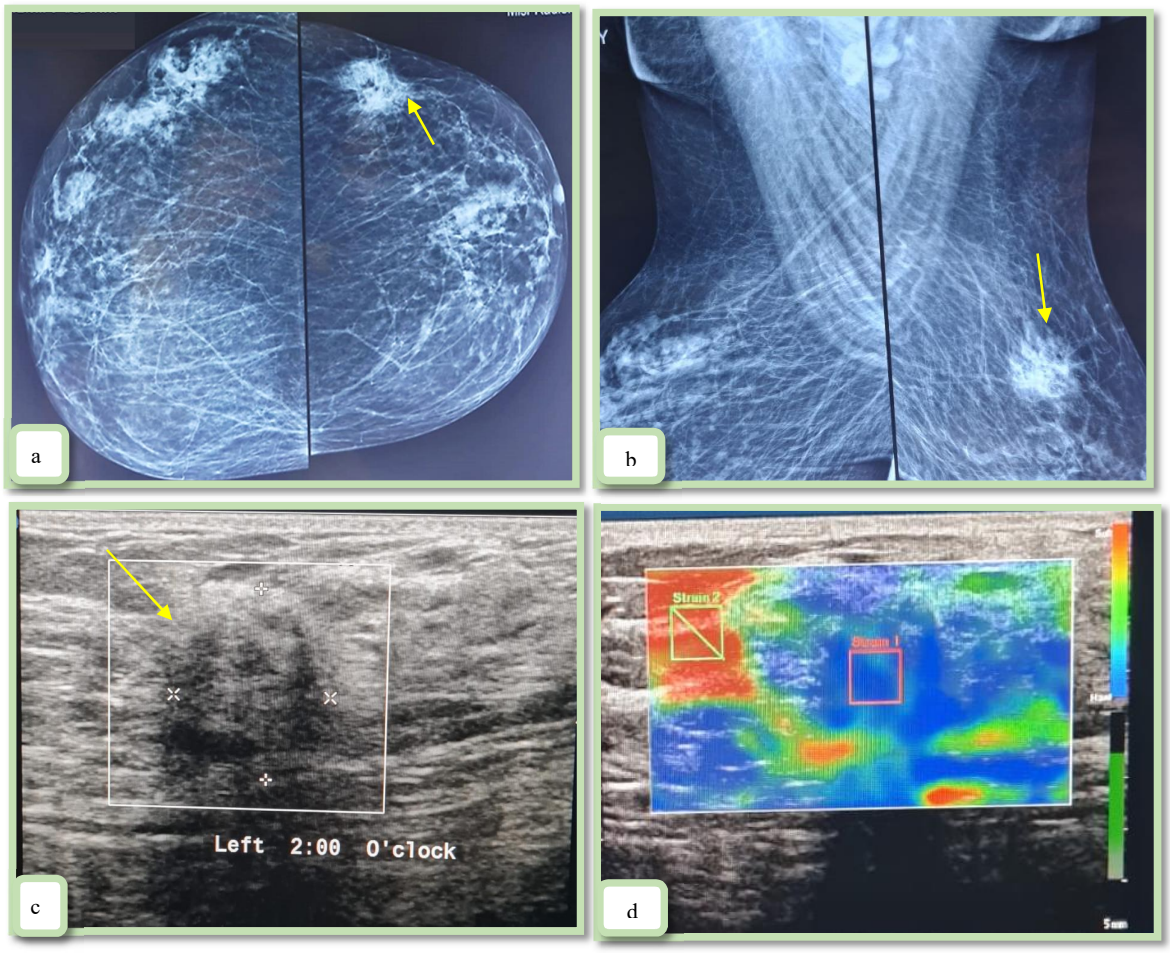

Fig. 1: 56-year-old obese post-menopausal female patient complained of a left breast lump. (a & b) Bilateral digital mammography, craino-caudal and medio-lateral oplique views (CC & MLO) respectively, showed increased fibro-glandular condensation suggestive of mild fibroadenosis (ACR b), an irregular opacity at left upper breast (yellow arrows). (c)Transverse B- mode of breast ultrasonography, revealed an irregular hypoechoic soft tissue lesion was seen at the left 2 O'clock position (yellow arrows). (d) Elastography sonography examination revealed (transverse view), showed mixed green and blue colour with predominate of the blue colour (red box) breast lesion, compared to green square of normal breast tissue, denoting hard consistency of the breast lesion with high strain ratio (SR) 2.6, malignant breast lesion.

3. Results

This study comprised eight hundred Egyptian female patients with breast lesions; their age ranged from 30 to 65 years. They were divided into two groups: the premenopausal group (30-45 years) and the postmenopausal group (45-65 years); their mean age was 38 years ± 2.3 SD & 59 years ± 6.4 SD, respectively. Regarding menopausal state, premenopausal women's mean weight was 79.6 ± 5.7 kg SD, mean height was 161.3 ± 6.8 cm SD, mean WC was 89.5 ± 11.8 cm SD, mean HC was 108.6 ± 10.6 cm, and mean WHR was 0.88 ± 0.1. While the post-menopausal women's mean weight was 82.7 ± 6.8 kg SD & mean height was 156.7 ± 5.3 cm SD, mean WC was 96.3 ± 10.6 cm SD, mean HC was 120 ± 11.7 cm SD, and mean WHR was 0.91 ± 0.4. Then, according to BMI, they were classified into three groups: normal weight (no. = 245) (130 pre-menopausal & 115 post-menopausal), overweight (no. = 265) (140 pre-menopausal & 125 post-menopausal), and obese (no. = 290) (130 pre-menopausal & 160 post-menopausal) (Table 1).

Regarding anthropometric parameters, females with high BMI (obese) were highly frequently in post-menopausal women, as well as the age, which was significantly older in post-menopausal patients. However, there were insignificant differences noted in weight and height in (normal-weight and overweight) between both groups. Post-menopausal women had significantly higher WC than pre-menopausal women, although HC was significantly higher in post-menopausal women. There was insignificant change at the WHR between both groups.

Table 1: Descriptive data of anthropometric parameters according to menstrual status

	Pre-menopausal No. 400	**Post-menopausal No. 400**	***P-value***
Age (mean years ± SD)	38 ± 2.3	59 ± 6.4	0.36
Weight (mean ± SD)	79.6 ± 5.7kg	82.7 ± 6.8 kg	0.41
Height (mean ± SD)	161.3 ± 6.8 cm	156.7 ± 5.3 cm	0.26
BMI (mean ± SD)	27.2 ± 4.6	31.4 ± 5.2**	0.01
- **Normal-weight No. 245 (No. & %)**	130 (16.3%)	115 (14.4%)	0.32
- **Overweight No. 265 (No. & %)**	140 (17.4 %)	125 (15.6%)	0.56
- **Obese No. 290 (No. & %)**	130 (16.3%)	160 (20%) **	0.05
Waist Circumference (mean ± SD)	87.5 ± 11.6 cm	96.3±10.6 cm **	0.01
Hip Circumference (mean ± SD)	109.6 ±10.7 cm	120 ± 11.7 cm*	0.18
WHR (mean ± SD)	0.88 ± 0.2	0.91 ± 0.4	0.15

**p*-value <0.05 is significant; ***p*-value <0.01 is highly significant

The BIRADS classification of breast lesions by sono-mammography was done; the normal breast tissues (BIRADS 1) and benign breast lesions (BIRADS 2) were more frequently detected in the premenopausal females. While insignificant differences were detected in (BIRADS 3) breast lesions between pre- and post-menopausal patients. The malignant breast lesions (BIRADS 4 & 5) were significantly frequent in postmenopausal women (Figure 2).

Moreover, elastography ultrasonography was done to differentiate the soft tissue breast lesions into benign and malignant by strain ratios (SR); the malignant breast lesion had a significantly higher SR compared to that of benign breast lesions. The mean SR value for benign breast lesions was (0.8 ± 0.5), while that for malignant lesions was 1.8 ± 0.7. The qualitative assessment by colour map of elastography revealed the blue colour was significantly more frequent for the malignant breast lesions while the green colour was for benign breast lesions ($P \leq 0.05$). Then classification of breast lesions was done according to elastography grades into benign & malignant breast lesions. The benign lesions of the breast were detected in 340 female patients (42.5%); 210 premenopausal female patients (26.3%) and 130 postmenopausal female patients (16.2%). The benign lesions included fibrocystic breast changes and benign soft tissue lesions (fibroadenomata). While the malignant lesions were detected in 460 female patients (57.5%), 190 pre-menopausal female patients (23.7%) and 270 post-menopausal female patients (33.8%).

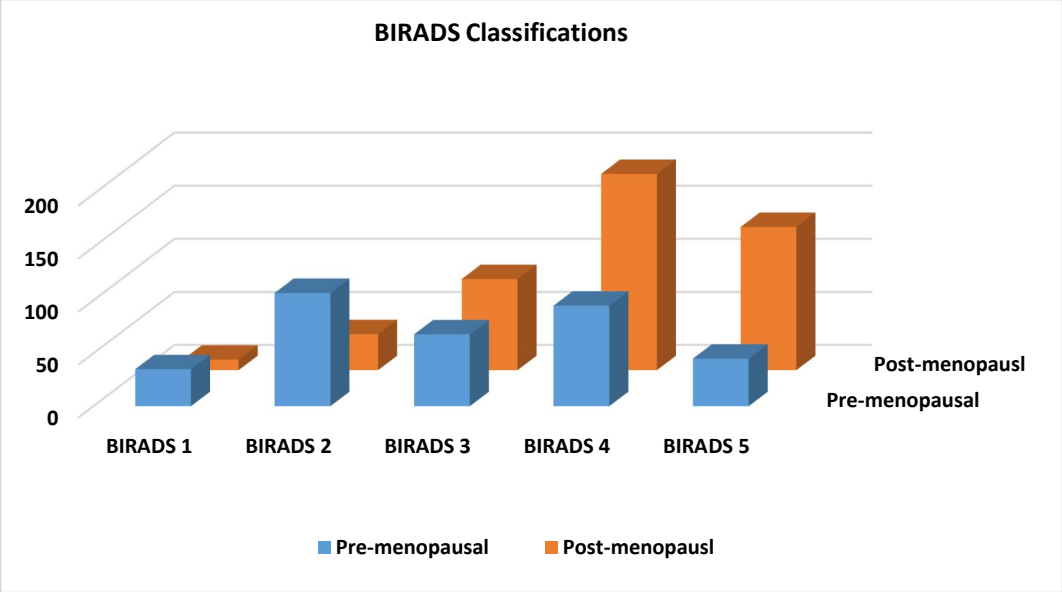

Fig. 2: BIRADS classifications according sono-mammography; normal (BIRADS 1), benign breast lesions (BIRADS 2 & BIRADS 3) and malignant breast lesions (BIRADS 4 & BIRADS 5) in pre and post-menopausal women.

In addition, the association between elastography findings and anthropometric measurements was done and revealed that in premenopausal women, there was a highly significant association between benign breast lesions and normal-weight (BMI) women, as 11.2% of lesions are benign, opposite 5% of malignant lesions detected in normal-weight patients, these denoting that most of the lesions in normal-weight BMI are benign. There were insignificant changes in overweight and obese women with the nature of breast lesions. Also, there was a highly significant increase in waist circumference with malignant breast lesions. While insignificant change at the hip circumference and WHR. In post-menopausal women, there was a highly significant association between malignant breast lesions and overweight and obese women, as 27.4% of lesions are malignant, opposite 8.2% of benign lesions, while there were insignificant changes with normal-weight women. In addition, there was a significant association between increased waist circumference (WC) and WHR with malignant breast lesions (Table 2).

Table 2: Association between breast lesion nature by elastography and anthropometric measurements in pre and post-menopausal Egyptian women

	Elastography of breast Lesions		
	Benign No. 340 (42.5%)	**Malignant No. 460 (57.5%)**	***P-value***
Pre-menopausal (No. & %)	210 (26.3%)	190 (23.7%)	
BMI (mean ± SD)	27.3 ± 3.1	29.8± 4.2 *	0.05
- **Normal weight** 130 (16.3%) (No. & %)	90(11.2%) **	40 (5%)	0.01
- **Overweight** 140 (17.4%) (No. & %)	62 (7.8%)	78 (9.7%)	0.12
- **Obese** 130 (16.3%) (No. & %)	58 (7.3%)	72 (9%)	0.23
Waist Circumference (WC) (mean ± SD)	85.1±10.3 cm	92.4±11.2 cm **	0.00
Hip Circumference (HC) (mean ± SD)	107.1±11.7 cm	114±10.8 cm	0.53
WHR (mean ± SD)	0.85± 0.7	0.87± 0.9	0.25
Post-menopausal (No. & %)	130 *(16.2%)*	270 (33.8%)	
BMI (mean ± SD)	27.9±4.2	31.2± 4.7 **	0.00
- **Normal weight** 115 (14.4%) (No. & %)	64 (8%)	51(6.4%)	0.12
- **Overweight** 125 (15.6%) (No. & %)	37 (4.6%)	88 (11%) **	0.01
- **Obese** 160 (20%) (No. & %)	29 (3.6%)	131 (16.4%) **	0.00
Waist Circumference (WC) (mean ± SD)	90.7±8.5 cm	109.6±11.3 cm **	0.00
Hip Circumference (HC) (mean ± SD)	112.7±10.1 cm	117±10.9 cm	0.36
WHR (mean ± SD)	0.84± 0.3	0.92 ± 0.7 *	0.04

*p-value <0.05 is significant; **p-value <0.01 is highly significant

Then the correlation between breast lesions and BMI & waist circumference in pre and post-menopausal Egyptian women was done and revealed that; BMI had a statistically significant negative correlation with benign breast lesions in pre-menopause women (r = -0.43 & p = 0.05) and a statistically significant positive correlation with malignant lesion in post-menopausal women (r = 0.46 & p = 0.00). While waist circumference showed a statistically positive significant correlation with malignant lesion in both pre and post-menopausal women (r = 0.32 & p = 0.00) (r = 0.42 & p = 0.01) respectively (Table 3 & 4).

Table 3: Correlation between breast lesion and BMI in pre and post-menopausal Egyptian women

Breast lesion	BMI			
	Pre-menopausal		Post-menopausal	
	r	*P*-value	r	*P*-value
Benign	-0.43	0.05*	-0.36	0.06
Malignant	-0.27	0.07	0.46	0.00**

**p*-value <0.05 is significant; ***p*-value <0.01 is highly significant

Table 4: Correlation between breast lesion and waist circumference in pre and post-menopausal Egyptian women

Breast lesion	Waist Circumference			
	Pre-menopausal		Post-menopausal	
	r	P-value	r	P-value
Benign	-0.12	0.07	-0.28	0.06
Malignant	0.32	0.00**	0.42	0.01**

**p*-value <0.05 is significant; ***p*-value <0.01 is highly significant

4. Discussion

Menopausal status influences breast lesion outcomes and prognoses (Godina *et al.,* 2020). One of the few risk factors for breast mass that may be changed is anthropometry. It is regarded as essential to the genesis of breast cancer. However, there is ongoing debate in the research regarding the relationship between anthropometry and breast lesion risk, which is impacted by a variety of factors such as menopausal state, lifestyle, ethnicity, and reproduction (AlFaris *et al.,* 2020). Also, it is still debatable if menopause status and obesity or increased adiposity are related (´García-Estévez *et al*., 2021).

On analyzing our results, we deduced that, regarding anthropometric parameters, females with high BMI (obese) were highly frequently in post-menopausal women, as well as the age, which was significantly older in post-menopausal patients. According to a different study, the two primary characteristics of breast masses in Egyptian women were the preponderance of advanced stage and young age at diagnosis. This demonstrates how age can be a stand-alone predictor of biological aggression (Kanbayti.*et al.,* 2021).

Despite having much higher HC, post-menopausal women had significantly higher WC than pre-menopausal women. There was insignificant change at the WHR between both groups. Moccia *et al*. also provided an explanation for these findings, stating that an increase in adiposity, which preferentially accumulates in the abdominal region, is linked to the menopausal transition. The phenomena can be explained by hypo-estrogenism and the imbalance of the androgen/estrogen ratio, while other hormonal factors most likely also contribute (Moccia *et al*., 2022).

However, a recent cross-sectional study investigate the relationship between women's anthropometric and body composition indices and menopausal state, concluded that the adjusted model did not find any association with anthropometric indices and menopausal status. Although menopause causes a number of health issues and is linked to obesity, it is unclear how menopausal status and obesity

are related because of a number of confounding factors, including age and decreased physical activity (´García-Estévez et al., 2021).

BMI, WC, and WHR were consistently greater among participants with breast cancer, according to our study. Overweight and obese women were significantly more likely to have malignant breast lesions in postmenopausal women, whereas normal-weight women showed no alterations. BMI had a statistically significant positive correlation with malignant lesions in post-menopausal women. In addition, waist circumference had a statistically positive significant correlation with malignant lesion in both pre and post-menopausal women. Consequently, central obesity seems to be a major risk factor for breast cancer in postmenopausal women. Other reports in the literature concurred with this finding (Okoli *et al.,* 2020). An Indian study, on the other hand, found that while high BMI was not linked to either premenopausal or postmenopausal breast cancers, higher WC and WHR were linked to an increased risk of premenopausal breast cancer (Mohanty and Mohanty 2021).

Obesity generally influences breast cancer incidence by generating metabolic and hormonal abnormalities (Danino *et al*., 2019). The influence of hyperinsulinemia may be the cause, according to some authors. Insulin increases leptin, decreases adiponectin, and prevents the liver from producing sex hormone-binding globulin. Furthermore, insulin controls the expression of vascular endothelial growth factor. Together, these chemicals hasten cell divisions and trigger transcriptional factor synthesis, which promotes the development of breast cancer (Bapat *et al.* 2022).

In the present study, BIRADS classification of breast lesions by sono-mammography was done; the normal breast tissues (BIRADS 1) and benign breast lesions (BIRADS 2) were more frequently detected in the pre-menopausal females. While insignificant differences were detected in (BIRADS 3) breast lesions between pre- and post-menopausal patients. The malignant breast lesions (BIRADS 4 & 5) were significantly frequent in postmenopausal women. The association between elastography findings and anthropometric parameters was done in this study and revealed that in premenopausal women, there was a very noteworthy association between benign breast lesions and normal-weight (BMI) women, denoting that most of the lesions in normal-weight BMI are benign. Women who were overweight or obese and had breast lesions showed negligible changes. A meta-analysis containing data from 12 prospective cohort studies with 22,728,674 people showed similar results. A marginally positive connection was found in the meta-analysis, indicating that the risk of breast cancer increased by 2% for every 5 kg/m2 increase in BMI. Surprisingly, premenopausal women with greater BMIs seemed to have a lower risk of breast cancer (Liu *et al.*, 2018).

Researchers Xia and colleagues and Guo and colleagues conducted meta-analyses and found that a perimenopausal BMI can reduce the incidence of breast cancer by 0.07. According to them, there was no statistically significant correlation. The risk of breast cancer, on the other hand, might be considerably increased by an increase in BMI during the postmenopausal period, with chances of 0.21. According to these data, a higher BMI represents a substantial risk factor for breast cancer development during the postmenopausal phase but does not provide protection against breast cancer during the premenopausal period (Guo *et al*., 2016; Xia *et al.*, 2014).

Researchers also found that menopause is a significant risk factor because breast cancer differs in premenopausal and postmenopausal women in terms of its causes and features. Being overweight, for example, increases the risk of breast cancer in postmenopausal women but is less common in premenopausal women, though some research indicates an inverse association (Heer *et al.,* 2020).

We advise educating women over 40 about the importance of yearly and routine screening tests for the early diagnosis of breast cancer. our study suggests the need to manage obesity in breast cancer prevention especially in post-menopausal women. The implementation of public health initiatives that guarantee access to suitable, reasonably priced diagnostic testing and treatment is necessary to lessen the burden of breast cancer.

5. Conclusion

Pre-menopausal Egyptian women were more likely to have benign breast lesions, while post-menopausal women were more likely to have malignant breast disease. The effects of obesity differ in both of them. According to this study, postmenopausal women who are obese have a higher risk of developing malignant breast lesions. A large waist circumference is also linked to an increased risk of malignant breast lesions, which highlights the significance of taking this into account.

Conflict of interest
The authors state no conflict of interest.

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Author contribution

Sondos M. Salem: Drafting the work And Clinical assessment. **Doaa A. Osman:** Acquisition of the data. **Mahmoud Zaatar:** Clinical assessment. **Shymaa A. Shalaby:** Drafting the work and radiological assessment. **Alshaimaa M. AbdelMoaty:** Data acquisition. **Reham Yousry El-Amir:** Data collection. **Safenaz Y. El Sherity** (corresponding author): The work's design, data analysis, interpretation, and critical revision for significant intellectual substance. Each author contributed to the work's design and final approval of the publication version.

References

Abdelaziz, A.H., M.A. Shawki., A.M. Shaaban, S.K. Albarouki., A.M. Rachid, O.M. Alsalhani and M.K. Jomaa, 2021. Breast Cancer Awareness among Egyptian Women and the Impact of Caring for Patients with Breast Cancer on Family Caregivers' Knowledge and Behaviour. Res Oncol., 17(1): 1-8. DOI: 10.21608/resoncol.2020.42340.1114.

AlFaris N., N. AlKehayez , F. AlMushawah , A .AlNaeem , N. AlAmri and E. AlMudawah , 2020. Anthropometry, bone mineral density and risk of breast cancer in premenopausal and postmenopausal Saudi women. Arch Med Sci., 19(3):608–617. doi: 10.5114/aoms.2020.98676.

Bapat, S.P., C. Whitty, C.T. Mowery, Y. Liang, A. Yoo, Z. Jiang, et al., 2022. Obesity alters pathology and treatment response in inflammatory disease. Nature, 604:337e42.

García-Estévez, L., Corte´s J., S. Perez, I. Calvo, I. Gallegos and G. Moreno-Bueno, 2021. Obesity and Breast Cancer: A Paradoxical and Controversial Relationship Influenced by Menopausal Status. Front Oncol. 2021 Aug 13:11:705911. doi: 10.3389/fonc.2021.705911. eCollection 2021.

Godina C., E. Ottander, H. Tryggvadottir, S. Borgquist, K. Isaksson and H. Jernström, 2020. Prognostic Impact of Menopausal Hormone Therapy in Breast Cancer Differs According to Tumor Characteristics and Treatment. Front. Oncol., 06 February 2020. Sec. Cancer Epidemiology and Prevention. Volume 10 – 2020. https://doi.org/10.3389/fonc.2020.00080.

Danino, M., A. El Khatib, O. Doucet, L. Dao, J. Efanov, J. Bou-Merhi, M. Iliescu-Nelea, 2019. Preliminary Results Supporting the Bacterial Hypothesis in Red Breast Syndrome following Postmastectomy Acellular Dermal Matrix- and Implant-Based Reconstructions. Plast Reconstr Surg. ,144(6):988e-992e.

Emily, H., H. Andrew, E. Noah, S. Hyuna, Mc. Valerie, F. Benaoudia and M. Miranda, 2020. Global burden and trends in premenopausal and postmenopausal breast cancer: a population - based study. The Lancet Global Health, 8 (8): e1027–e1037.

Guo, Y., S.W. Andersen, X.O. Shu, et al., 2016. Genetically predicted body mass index and breast cancer risk: Mendelian randomization analyses of data from 145,000 women of European descent. PLOS Med., 13: e1002105.

Heer, E. , A. Harper, N. Escandora , H. Sung, V. Cormack and M. Benaoudia, 2020. Global burden and trends in premenopausal and postmenopausal breast cancer: a population-based study. The Lancet Global Health, 8 (8): e1027-e1037.

Hiernaux, J and J.M. Tanner, 1969. 'Growth and physical studies', In J.S. Weiner, S.A. Lourie (Eds.), Human Biology: A guide to field methods. London: IBP; Oxford, UK: Blackwell Scientific Publications, 1969.

Kanbayti, I., R.Wid , M. McEntee, Z. Gandomkar and E.Ekpo, 2021. Clinicopathologic breast cancer characteristics: predictions using global textural features of the ipsilateral breast mammogram. Radiological Physics and Technology, 14(3):248-261. https://doi.org/10.1007/s12194-021-00622-6 PMID: 34076829.

Karim, M.O., K.A. Khan, A.J. Khan, A. Javed, S. Fazid and M.I. Aslam, 2020. Triple Assessment of Breast Lump: Should We Perform Core Biopsy for Every Patient? Cureus, 12 (3): e7479.

Liu, K., W. Zhang, Z. Dai, M. Wang, T. Tian, X. Liu, H. Kang, H. Guan, S. Zhang and Z. Dai, 2018. Association between body mass index and breast cancer risk: Evidence based on a dose-response meta-analysis. Cancer Manag. Res., 10, 143–151.

McMullen, E., N. Zoumberos and C. Kleer, 2019. Metaplastic Breast Carcinoma: Update on Histopathology and Molecular Alterations. Arch Pathol Lab Med., 143 (12):1492-1496.

Moccia, P., R. Belda-Montesinos, A. Monllor-Tormos, P. Chedraui and A. Cano, 2022. Body weight and fat mass across the menopausal transition: hormonal modulators. Gynecol Endocrinol., 38(2):99-104.

Mohanty, S.S. and P.K. Mohanty, Obesity as potential breast cancer risk factor for postmenopausal women. Genes & Diseases. Volume 8, Issue 2, March 2021, Pages 117-123.

Okoli, C.C., U.R. Ebubedike, S.N.C. Anyanwu, C.D. Emegoakor, G.U. Chianakwana, E. Ihekwoaba, O. A. Egwuonwu and H. Nzeako, 2020. Anthropometric Variables in Relation to Risk of Breast Cancer in Nigerian Women. International Journal of Medicine and Health Development 25(2): 132-137. DOI: 10.4103/ijmh.IJMH_35_19.

Schünemann, H.J., D. Lerda, C. Quinn, M. Follmann, P. Alonso-Coello, P.G. Rossi, A. Lebeau, L. Nyström, *et al*. 2022. European Commission Initiative on Breast Cancer (ECIBC) Contributor Group. Breast Cancer Screening and Diagnosis: A Synopsis of the European Breast Guidelines. Ann Intern Med., 172(1):46-56.

Women's NCCf, Health CS. Menopause: full guideline. 2015.

Xia, X., W. Chen AND J. Li, et al., 2014. Body mass index and risk of breast cancer: a nonlinear dose-response meta-analysis of prospective studies. Sci Rep 2014; 4: 7480.