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ANTHROPOMETRIC VARIABLES IN BREAST LESIONS OF WOMEN OF REPRODUCTIVE AGE IN UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL

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Background. Benign breast diseases are a potential health concern to a large number of women. The incidence of cancer is increasing worldwide. A steady increase in incidence has been observed in most developed and developing counties.

Objective. Thus, our study seeks to investigate the anthropometric variables implicated in breast lesions of women of reproductive age.

Methods. This is a descriptive and prospective study with a random sampling method; the data was obtained from the Department of Surgery, Radiotherapy and Oncology Unit of University of Port Harcourt Teaching Hospital. A total number of 146 subjects (18-49 years) were involved into this study. A number of 90 were breast lump patients and 56 were breast cancer patients.

Results. Data obtained was analysed with Microsoft Excel. Our results show no statistically significant difference (P> 0.05) in the body mass index (BMI) and waist-hip-ratio (WHR) of both the breast lump and breast cancer patients. This study supports the fact that high BMI is a predictive marker for breast lumps and cancer in women.

Conclusion. The study has also identified that high BMI favours the incidence of breast lumps and breast cancers in women of reproductive age.

KEYWORDS: **anthropometric variables; BMI; waist-hip-ratio; breast cancer; breast lump.**

Introduction

Benign breast diseases are common throughout a woman's lifetime, from early reproductive life to the postmenopausal part of life, making it a potential health concern to a large number of women. Malignant lesions on the other hand are cancerous in nature and are characterized by progressive and uncontrolled growth. Breast cancer is one of the most common types of malignant diseases, affecting millions of women around the world, with a high rate of morbidity and mortality. The prevalence rate of breast cancer, particularly in Nigeria, accounts for 20% to 25% of tumours in women with an annual incidence of about 800 to 1000 cases [1]. African breast cancer patients tend to present at a younger age, with a lesion characterized by large and palpable tumour, multiple nodal involvements, and have poorer clinical and pathological prognostic factors compared with Caucasian patients [2]. These documented characteristics are somewhat similar to that of African-Americans but are in contrast with those of non-Hispanic Whites in the USA, which therefore calls for the consideration of genetic factors in the aetiology of breast cancer in general, and in people of African origin in particular [3, 4].

In 2017, an estimated 252,710 new cases of invasive breast cancer were diagnosed among women and 2,470 cases were diagnosed in men and thus approximately 40,610 women and 460 men were expected to die from breast cancer in 2017 [5]. The incidence of cancer is increasing worldwide. A steady increase in incidence has been observed in most developed and developing counties. Apart from incidence, cancer related deaths are also increasing. There were over 230,000 new cases of breast cancer each year in the United States as at 2015. Some studies had affirmed that the risk of breast cancer increase with age, and in the United States approximately one out of eight women will get breast cancer at some point in their lives [6, 7, 8]. Thus with 1.7 million new cases diagnosed in 2012, constituting 12% of all new cancer cases and 25% of all cancers in women, breast cancer remains the commonest site-

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specific malignancy affecting women and the most common cause of cancer death in women.

In Nigeria, female breast cancer is recognized as major cause of morbidity and mortality with incidence rate ranging from 36.3 to 50.2/100,000 live birth [9]. More so, late presentation of patients at advanced stages when little or no benefit can be derived from any form of therapy is the hall mark of breast cancer. Reasons given include poverty, under-education, lack of knowledge and poor access to care [10]. Indeed, the ratio of mortality to incidence in Africa is 0.73, compared to below 0.23 in North America and 0.354 in Latin America and the Caribbean [11]. Risk factors associated with breast cancer development include non-modifiable ones such as female sex, increasing age, a history of breast cancer in close relatives especially in mothers and siblings. Non-modifiable ones include early menarche before the age of 14 years or menopause later than the age of 55 years. Other risks include overweight and obesity, prolonged use of hormone replacement therapy, oral contraceptives, tobacco use, alcohol intake, nulliparity or having first child after age 35. Thus, our study seeks to investigate the anthropometric variables implicated in breast lesions of women of reproductive age.

High body weight (measured in terms of body mass index, BMI) has been recognized as an important risk factor for breast cancer among postmenopausal women in many previous epidemiological studies [12, 13, 14, 15]. After menopause, epidemiological evidence found a substantial positive association between BMI and breast cancer risk [16]. A meta-analysis showed that the substantial positive association between post-menopausal BMI and breast cancer risk was confined to hormonal factors [17]. Some studies have shown a decreased risk for premenopausal women [18, 19], while others have shown no association [20, 16]. Breast cancer has been documented in other studies as the most frequently occurring cancer in women of reproductive age [21].

Methods

This is a descriptive and prospective study with a random sampling method; the data was obtained from the Department of Surgery, Radiotherapy and Oncology Unit University of Port Harcourt Teaching Hospital. Demographic information such as age, body weight, height, waist circumference, hip circumference was obtained from the patients. A consent form was given to the patients prior to data collection. The population of this study includes breast lumps and breast cancer patients, the age range of 18 - 49 years old, of University of Port Harcourt Teaching Hospital, Rivers State, Nigeria. The participants voluntarily consented to the study which was conducted in compliance with the ethical standards. A total number of 146 subjects were involved into the study; 90 of them were breast lump patients and 56 were breast cancer patients. Data obtained was analysed with Microsoft Excel.

The following anthropometric variables were measured.

I. Weight (kg): Weight is measured to the nearest 0.1 kg when the subject is standing and putting on light indoor clothes excluding shoes, belt and sweater using a weighing scale. Heavy jewellery if any present was removed and pockets emptied.

II. Height (cm): Standing height is the measurement of the maximum distance from the floor to the vertex, when the subject is facing forward.

III. The BMI: It was calculated as the ratio of weight in kilogram by square of height in meters (m^2). i.e.: BMI (kg/m^2) = weight (kg)/ height (m^2). It is a measure of body mass corrected for height which is used to assess the extent of weight deficit or excess. BMI also provides a practical indicator of adiposity and hence overweight or obesity.

IV. Waist circumference (cm): The tape is used to circle the waist (like a belt would circle the waist) at the natural waistline, which is midpoint between the lowest rib and the iliac crest. The subject is asked to stand erect while measurements are taken. The measurement is taken at the midpoint between the lowest rib and the iliac crest. The measuring tape is placed perpendicular to the long axis of the body and horizontal to the floor, with sufficient tension to avoid slipping off but without compressing the skin. The measurement is made at the end of a normal expiration to the nearest 0.1 cm

V. Hip circumference (cm): The subject stands erect, the weight is evenly distributed on both feet. The tape is placed at the maximum extension of the buttocks, horizontal to the floor, with sufficient tension to avoid slipping off. The tape is held a bit tighter but without compressing the buttocks. The zero end of the tape is held under the measurement value recorded to the nearest 0.1 cm.

VI. Waist hip-ratio (WHR): This is calculated by dividing the waist measurement by the hip measurement, since the hips are the widest part of the buttocks. The formula is: WHR = waist circumference/hip circumference.

Ethical approval

Ethical approval was obtained from the Research Ethics Committee of University of Port Harcourt Teaching Hospital with the number of UPTH/ADM/90/S.II//VOL.XI/1270.

Informed consent was obtained from all respondents prior to data collection.

Results

The data in Table 1 shows that the mean BMI for age group (18-25) is 23.71, which is normal according to World Health Organization (WHO) classification.

Table 2 shows the anthropometric data for women with breast cancer who had the mean BMI of 26.89, 27.92, 26.85, and 28.62 for the various age groups studied. They therefore just like their counterparts with breast lumps are within the overweight category.

A T value of -0.88 means that there is some similarity between the BMI of those with breast lump and those with breast cancer; however, the T value shows some difference does exist. The negative T value shows that BMI values affect both the occurrence of lumps and that of cancer. The data shows that both patients with breast lumps and those with breast cancers all have high BMI: overweight.

A P value of 0.38 (>0.05) shows that there is no statistical difference in the BMI of patients with breast lump and breast cancer. Thus, high BMI favours the occurrence of breast lumps and cancers in women of reproductive age (Table 3).

A P value of 0.44 (> 0.05) shows that there is no statistical difference in the WHR of the patients with breast lump and breast cancer. However, those with breast cancer have a higher mean BMI and a higher mean WHR. Thus, BMI and WHR affects the incidence of breast cancer (Table 4).

Discussion

The results of this study showed that many of the participants involved were overweight. Also, for age groups (26-33), (34-41) and (41-42), their mean BMI were 25.69, 27.54 and 29.93,

Table 1. Average anthropometric values of reproductive age women with breast lump

Age group (years)	N	Weight (kg)	Height (m)	BMI	X	WC (cm)	HC (cm)	WHR	X
18-25	15	63.93	1.64	23.71	Normal	69.09	84.16	0.80	Normal
26-33	26	67.42	1.62	25.69	Overweight	74.25	89.66	0.83	Normal
34-41	29	73.97	1.63	27.54	Overweight	79.18	97.91	0.81	Normal
42-49	20	78.85	1.63	29.93	Overweight	83.95	101.48	0.83	Normal

Notes. N – number of subjects, BMI – Body Mass Index, WC – waist circumference, HC – height circumference, WHR – waist-hip ratio. WHR (Women): <0.85 = Normal, >0.85 = Risk, X – classification.

Table 2. Average anthropometric values of reproductive age women with breast cancer

Age group (years)	N	Weight (kg)	Height (m)	BMI	X	WC (cm)	HC (cm)	WHR	X
18-25	2	68	1.59	26.89	Overweight	76.20	88.9	0.85	Risk
26-33	9	75.78	1.65	27.92	Overweight	83.82	101.04	0.84	Normal
34-41	25	72.24	1.64	26.85	Overweight	82.30	98.14	0.84	Normal
42-49	20	73.90	1.61	28.62	Overweight	84.20	105.54	0.80	Normal

Notes. N – number of subjects; BMI – body mass index; WC – waist circumference; HC – height circumference; WHR – waist-hip Ratio. WHR (Women): < 0.85 = normal, > 0.85 = risk, X – classification.

Table 3. Relationship between BMI of breast lump and breast cancer patients irrespective of age group

X	N	Percentage, %	Mean±SD	T value	P value	Inference
Breast lump	90	61.64	26.90±4.71	-0.88	0.38	Not significant
Breast cancer	56	38.35	37.66±5.28			

Notes. X – classification; BMI – body mass index; SD – standard deviation.

Table 4. Relationship between the waist-hip ratio of breast lump and breast cancer patients irrespective of age group

X	N	Percentage, %	Mean±SD	T value	P value	Inference
Breast lump	90	61.64	0.82±0.06	-0.77	0.44	Not significant
Breast cancer	56	38.35	0.83±0.07			

Notes. X – classification, WHR – waist-hip ratio, SD – standard deviation.

respectively, indicating that they were all in the overweight category. The mean waist hip ratio (WHR) was within the norm for all the women within this age group and classification. Our data shows the anthropometric data for women with breast cancer, who had the mean BMI of 26.89, 27.92, 26.85, and 28.62 for the various age groups studied. They therefore just like their counterparts with breast lumps are within the overweight category. Their WHR were also within norm except for women within the age group 18-25 (Table 2). Again, both Tables 3 and 4 shows that there is no statistically significant difference (P> 0.05) in the BMI and WHR of both the breast lump and breast cancer patients. Thus, the same variables implicated in the incidence of breast lumps also affected those of breast cancers. Our study therefore shows that the same anthropometric variables present in reproductive age women with breast lump were also found in those women with breast cancer. High BMI thus influences the incidence of breast lump and breast cancers proportionately, as more than seventy percent of the subjects are within the overweight category. The WHR in the study was not a major factor to have influenced the lumps and cancers. About 62% of the patients studied had breast lumps and about 38% had breast cancers.

The findings were consistent with several other authors who reported that high BMI favours the occurrence of breast cancer in women, especially postmenopausal women [16, 22], although our study covered women within the reproductive age. It is therefore apparent to affirm that high BMI favours the occurrence of both breast lumps and cancers in women. One most classical biological explanation is as a result of a female hormone-related mechanism. This is for the fact that adipose tissue may be a major source of oestrogens [14], which are critical mitogens for mammary epithelial cells [12, 15].

Despite the fact that our findings are associated high BMI with cancer among women of reproductive age, some other studies among premenopausal women are inconsistent and unclear [23]. Some studies have shown a decreased risk for breast cancer among premenopausal women [18, 19] while others have shown no association [16, 20]. Our study did not compare breast cancer risk between healthy women and cancer patients though, as we only focused on the prevalent anthropometric variables among women with breast lesions. Most probably this comparison would have shown the level of risk association between the two groups as argued by previous researchers. Nonetheless our study has identified the association of high BMI with breast lumps and cancers in women of reproductive age.

Conclusion

This study supports the fact that high BMI can be used as a tool to predict breast cancer as well as breast lumps for women. More so the study has also identified that high BMI favours the incidence of breast lumps and breast cancers in women of reproductive age. The findings did not show any statistically significant correlation between high WHR and breast lumps and/or breast cancers as most of the subjects in this category were within the norm despite being diagnosed of a lump and/or cancer.

Conflict of interest

Authors declare no conflict of interest.

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Author's contributions

Clinton David Orupabo – conceptualization, methodology, formal analysis, writing – reviewing and editing; *Chelsea Odoya George* – investigation, data curation, writing – original draft.

АНТРОПОМЕТРИЧНІ ПАРАМЕТРИ УРАЖЕНЬ МОЛОЧНОЇ ЗАЛОЗИ У ЖІНОК РЕПРОДУКТИВНОГО ВІКУ В УНІВЕРСИТЕТСЬКІЙ ЛІКАРНІ ПОРТ-ХАРКОРТ

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Вступ. *Зростання частоти та поширеності доброякісних захворювань молочної залози становить потенційну загрозу для значної кількості жінок. Ця тенденція спостерігається в більшості розвинутих країн і країнах, що розвиваються.*

Мета. *Наше дослідження було спрямоване на дослідження антропометричних змінних уражень молочних залоз у жінок репродуктивного віку.*

Методи. *Проведене описове проспективне дослідження методом випадкової вибірки, дані були отримані з відділення хірургії, променевої терапії та онкології університетської лікарні Порт-Харкорта. Усього в цьому дослідженні було залучено 146 пацієнток (18-49 років). З них 90 були пацієнтами з ущільненням грудей і 56 – з раком молочної залози.*

Результати. *Статистична обробка даних зроблена за допомогою Microsoft Excel. Аналіз даних не виявив статистично значущої різниці (P> 0,05) між індексом маси тіла (IMT) та показниками співвідношення талії і стегон (WHR) як у пацієнтів із доброякісними новоутворами молочної залози, так і у пацієнтів з раком молочної залози. Однак, отримані нами дані вказують на те, що високий IMT є прогностичним маркером утворення і розвитку доброякісних і злоякісних захворювань молочної залози.*

Висновки. *Високий індекс маси тіла є сприятливим фактором виникнення доброякісних та злоякісних захворювань молочної залози у жінок репродуктивного віку.*

КЛЮЧОВІ СЛОВА: **Антропометричні змінні; індекс маси тілі (IMT); Співвідношення талії та стегон; Рак молочної залози; Доброякісні захворювання молочної залози.**

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