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Epidemiological Pattern of Breast Diseases among Females in the South-Western Region, Saudi Arabia

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Abstract

Background: Breast diseases cover several conditions. The majority of breast diseases are noncancerous. Some of these lesions are clinically unremarkable, which needed minimal intervention. However, some symptoms may be of clinical value and attract the attention of both the patient and the attending physician, especially when they become persistent. The study aimed to assess the prevalence, pattern, types, and clinical profile of breast diseases among females in the South-western region, during the period from 2018-2020. **Methods:** A retrospective record-based descriptive approach was used through reviewing medical records of all cases with breast disease attended King Khalid Hospital during the period from January 2018 to January 2020. Data extracted throng pre-structured questionnaire. **Results:** The study included 211 cases whose ages ranged from 18 to 58 years old with a mean age of 28.9 ± 12.8 years. Breast mass was the most recorded complaint (95.1%) followed with breast pain (32%), skin changes. Benign findings based on the final pathology report were recorded for more than two thirds of the cases, with the most common finding were fibroadenoma. Excisional biopsy and modified radical mastectomy were the most reported surgical interventions. **Conclusions:** In conclusion, the study revealed that the majority of the cases had benign breast disease (BBD), where fibroadenoma was the most frequent.

1. Background

Breast diseases make up several conditions. The majority of breast diseases are noncancerous [1] [2]. Breast lesions are mainly recorded among females. The most recorded cause of breast problems in females is a benign breast disease, which is 10 times more common than breast cancer in most countries [3]. Some of these lesions are clinically unremarkable, which needed minimal intervention. However, some symptoms may be of clinical value and attract the attention of both the patient and the attending physician, especially when they become persistent. The main item behind that concern is the possibility of the occurrence of breast cancer, which is usually asymptomatic in the early stages during which it is curable [4]. Benign breast diseases are mainly prevalent during the reproductive age as the incidence is common mainly in the second decade with realization on its peak at fourth and fifth life year's decade [5]. Benign breast diseases include many and variable histological patterns categorized into non-proliferative breast lesions, proliferative breast lesions without atypia, and proliferative breast lesions with atypia [6] besides fibroadenoma, fibrocystic change, and breast abscess are the most recorded benign lesions in the literature [7]. Certain types of benign breast lesions were recorded as a significant risk factor for developing breast cancer [8]. Women with benign proliferative or atypical breast lesions consume a two-fold risk of developing breast cancer in western populations [9].

The literatures covered the histopathological pattern of breast diseases with less attention for the clinical perspectives [10] [11] [12]. Surgical evaluation of the symptomatic patients by triple assessment, namely, clinical examination of the breast, mammography, and breast biopsy for definitive histological diagnosis is required in many patients [13].

The current study aimed to assess the prevalence, pattern, types, and clinical profile of breast diseases among females in the South-western region, during the period from 2018-2020.

2. Methodology

Retrospective record-based descriptive approach was used through reviewing medical records of all cases that were admitted and have breast disease (benign or malignant breast masses) in King Khalid Hospital during the period from January 2018 to January 2020. Records with missing data were included. Data extracted through pre-structured questionnaire including patient's bio-clinical data, initial clinical presentation of the breast disease, radiological assessment findings. Also, the final pathological findings were extracted besides the nature

of the assigned pathology. Data also included the type of surgery and post operative outcome.

3. Statistical Analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using the two-tailed test. A P-value of less than 0.05 is considered being statistically significant. Descriptive analysis based on frequency and percent distribution was done for all variables, including demographic data, breast disease nature, and types, clinical presentation, and surgery outcome.

4. Results

The study included 211 cases whose ages ranged from 18 to 58 years old with a mean age of 28.9 ± 12.8 years. Exact of 59 (72%) of the females were married, and all of the sampled females started menstruation at the age of 18 years with regular menstrual cycle. Ten (67%) of the females are still menstruating. Only one (10%) of the study females had the first pregnancy before the age of 20 years and 10% above the age of 30 years. As for gravidity, 3 (10.3%) of the females had no pregnancy, while 31% had four pregnancies or more. Considering co-morbidity, diabetes mellitus was recorded among 5 (9.6%) of the females and 8 females (15.4%) had hypothyroidism (Table 1).

Table 2 demonstrates the determinants of having breast disease. Oral contraceptive pills were received by 8 (40%) of the study females, and 30.8% of them had hormonal therapy. A family history of breast disease, including breast cancer, was recorded for 4 females (23.5%). Only 8 (44.4%) of the females know about breast screening for early detection of breast lesions, while 23 females (85.2%) do breast examination regularly. Only one case recorded that she performs regular breast screening after the age of 40 years.

Concerning clinical data of recorded breast diseases (Table 3), breast mass was the most recorded complaint as recorded for 196 females (95.1%) followed with breast pain which was among 66 females (32%), skin changes (11; 5.3%), and nipple discharge (8; 3.9%). The symptoms = appeared for less than one month among 23.5% of the cases while lasted for more than 6 months among 52 females (39.4%). As for the affected side, the right side was dominant among 84 females (41.2%) of the cases while it was bilateral among 19 (9.3%). The breast mass measured less than 2 cm among 60 (37.5%) of the cases while it was more than 5 cm among 21 females (13.1%) of them. Margins of the breast mass were irregular among 46.2% of the cases, and the mass was soft among 59 of the patients (54.1%). Skin changes were recorded for 28 (22.2%) of the cases, and 53 cases (34.9%) had positive Axillary lymph nodes on physical examination.

Considering radiological and biopsy findings among the cases, Table 4 illustrates that the most recorded US finding was Fibrocystic disease (64; 49.6%) followed with cancer related features (29; 22.5%), breast abscess (8.5%), and fibroadenoma

Table 1. Personal and obstetric data for female patients with breast diseases in Najran, Southern Saudi Arabia.

Personal & obstetric data		No	%
	<20 years	17	8.1%
	20 - 30	42	19.9%
Age in years	30 - 40	65	30.8%
	40 - 50	75	35.5%
	50+	12	5.7%
	Single	19	23.2%
Marital status (n = 82)	Married	59	72.0%
	Divorced/widow	4	4.9%
Age of menarche	<18 years	20	100.0%
Regular menstrual cycle	Yes	22	100.0%
Age of menopause (n = 15)	Not at menopause	10	66.7%
	40 - 49 years	5	33.3%
	<20 years	1	10.0%
Age of pregnancy (n = 10)	20 - 30	8	80.0%
	30+	1	10.0%
	Nulligravida	3	10.3%
No. of pregnancies (n = 29)	1 - 3	17	58.6%
	4+	9	31.0%
	None	10	19.2%
	DM	5	9.6%
	HTN	7	13.5%
Co-morbidity	Hypothyroidism	8	15.4%
	Asthma	3	5.8%
	Others	8	15.4%
	Diabetic and HTN	11	21.2%

Table 2. Factors related to have breast disease among female patients in Najran, Southern Saudi Arabia.

Factors related to breast diseases		No	%
Oral contraceptive pills	No	12	60.0%
	Yes	8	40.0%
Hormonal therapy	No	9	69.2%
	Yes	4	30.8%
Family history of breast disease	No	43	76.8%
	Yes	13	23.2%
Family history of other cancers	No	13	76.5%
	Yes	4	23.5%
Know about breast screening	No	10	55.6%
	Yes	8	44.4%
Regular Breast Examination	No	4	14.8%
	Yes	23	85.2%
Who did the examination	By herself	12	52.2%
	By physician	11	47.8%
Regular breast screening after age 40	No	3	75.0%
	Yes	1	25.0%

Table 3. Clinical data of breast diseases among female patients in Najran, Southern Saudi Arabia.

Clinical data		No	%
Clinical signs & symptoms	Mass	196	95.1%
	Pain	66	32.0%
	Skin changes	11	5.3%
	Nipple changes	8	3.9%
	Swelling	4	1.9%
	Discharge	2	1.0%
	Others	2	1.0%
	Axillary mass	1	0.5%
Duration of symptoms	<1 month	31	23.5%
	1 - 2 ms	29	22.0%
	3 - 6 ms	20	15.2%
	>6 months	52	39.4%
Side of lesion	Right	84	41.2%
	Left	101	49.5%
	Bilateral	19	9.3%
Mass size	<2 cm	60	37.5%
	2 - 5 cm	79	49.4%
	>5 cm	21	13.1%
Margins of mass	Irregular	49	46.2%
	Regular	57	53.8%
Mass consistency	Soft	59	54.1%
	Hard	50	45.9%
Skin changes	No	98	77.8%
	Yes	28	22.2%
Nipple discharge	No	114	90.5%
	Yes	12	9.5%
Nipple retraction	No	89	84.8%
	Yes	16	15.2%
Nipple destruction	No	90	98.9%
	Yes	1	1.1%
Positive axillary lymph nodes	No	99	65.1%
	Yes	53	34.9%

Table 4. Radiological and biopsy findingsamongfemale patients with breast disease in Najran, Southern Saudi Arabia.

Radiological and biopsy findings		No	%
US findings	Fibrocystic disease	64	49.6%
	Cancer	29	22.5%
	Breast abscess	11	8.5%
	Fibroadenoma	10	7.8%
	Phyllodes	5	3.9%
	Unremarkable	2	1.6%
	Galactocele	1	0.8%
	Lactating adenoma	1	0.8%
	Mastitis	1	0.8%
	Mature adipose tissue with fibrous tissue	1	0.8%
	Antibioma	1	0.8%
Mammogram findings	Speculated mass	14	35.9%
	Microcalcification	10	25.6%
	Microcalcification, Speculated mass	9	23.0%
	Texture distortion	2	5.1%
	Fatty glandular breast parenchyma	1	2.6%
	Mixed fibro-fatty glandular breast prynchema	1	2.6%
	Multi cystic	1	2.6%
	Oil cyst	1	2.6%
MRI impression	Benign	21	41.2%
	Malignant	30	58.8%
Type of biopsy	Excisional	35	19.6%
	True cut	117	65.4%
	Fine needle aspiration cytology (FANC)	23	12.8%
	Incisional	3	1.7%
	Lumpectomy	1	.6%
Final pathology report	Benign	124	63.9%
	Malignant	70	36.1%
Nature of lesion	Fibroadenoma	66	42.9%
	Fibrocystic	29	18.8%
	Invasive ductal carcinoma (IDC)	29	18.8%
	Breast abscess	9	5.4%
	Atypical ductal hyperplasia	2	1.3%
	Mucinous carcinoma	2	1.3%
	Antibioma	1	0.6%

Continued

	Acute and chronic breast inflammation	1	0.6%
	Ductal ectasia	1	0.6%
	Ductal hyperplasia	1	0.6%
	Epidermoid cyst	1	0.6%
	Fibroepithelial lesion	1	0.6%
	Gynecomastia	1	0.6%
	Invasive mammillary carcinoma	1	0.6%
	Invasive papillary Ca	1	0.6%
	Lactating adenoma	1	0.6%
	Myofibroblastic tumor	1	0.6%
	Periductal & perilobular chronic inflammatory process	1	0.6%
	Phylloid with free margin less than 1 mm	1	0.6%
	Right axillary lipoma	1	0.6%
	Sebaceous cyst	1	0.6%
	Spidle cell tumor	1	0.6%
	Suggestive of tubular adenoma	1	0.6%
Ductal carcinoma *in situ*	No	18	56.3%
	Yes	14	43.8%

(10; 7.8%). Mammogram findings were also recorded with the most recorded one was speculated mass (14; 35.9%) followed with micro calcification (10; 25.6%), micro calcification with speculated mass (9; 23%), and texture distortion (2; 5.1%). MRI showed benign features among 21 cases (41.2%) of the cases. As for biopsy, 117 females (65.4%) of the cases undergone true cut biopsy followed with excisional biopsy (19.6%), and fine needle aspiration biopsy (12.8%). Benign findings based on final pathology report were diagnosed for 124 (63.9%) of the cases with the most common finding was fibroadenoma (66; 42.9%) followed with the fibrocystic disease (29; 18.8%), IDC (29; 18.8%) and breast abscess (9; 5.4%). Ductal carcinoma *in situ* was recorded for 43.8% of the cases.

Table 5 shows that Estrogens/Progestin Receptors were positive among 28 females (73.7%) of the cases and Human epidermal growth factor receptor 2 (HER2) was positive for 11 cases (30.6%) of the cases while Antigen Ki-67 was more than 12% among 10 cases (76.9%).

Regarding surgery and clinical outcome (Table 6), excisional Biopsy was the most surgical procedure (53; 41.1%) followed with modified radical mastectomy (28; 21.7%), lumpectomy (23; 11.6%) while 17.8% of the cases were not operated.

5. Discussion

Researchers reported wide variability in the frequency and distribution of breast

Table 5. Laboratory findings among female patients with breast disease in Najran, Southern Saudi Arabia.

Laboratory findings		No	%
Estrogens/progestin receptors	Negative	10	26.3%
	Positive	28	73.7%
Human epidermal growth factor receptor 2 (HER2)	Negative	25	69.4%
	Positive	11	30.6%
Antigen Ki-67	Less than 12%	3	23.1%
	More than 12%	10	76.9%

Table 6. Surgery data forfemale patients with breast disease in Najran, Southern Saudi Arabia.

Surgery data	No	%
Type of surgery		
Excisional biopsy	53	41.1%
Modified radical mastectomy	28	21.7%
Not operated	23	17.8%
Lumpectomy	15	11.6%
Incision and drainage	4	3.1%
Drainage	2	1.6%
LAMA	1	0.8%
Not mentioned	1	0.8%
Simple mastectomy	1	0.8%
Drainage	1	0.8%
Surgery complications		
None	87	83.7%
Seroma	9	8.7%
Wound infection	5	4.8%
Lymphedema	2	1.9%
Echymosis around the wound	1	1.0%

ailments across the world [14] [15] [16]. Breast diseases more recorded among women than men, the prevalence rate in males ranging from 0% to 5.8% in most series, and the majority of male breast lesions are benign with gynaecomastia [17]. As for females, the pattern of pathology had high variability based on age and geographical location. Benign lesions are prevalent at all ages, constituting 48.9% to 57% with the main age of occurrence below the 30 years [18] [19].

Benign breast lesions are more presented than cancer [20] [21] [22]. Benign breast diseases, however, formed a heterogeneous group of disorders, including developmental abnormalities, epithelial and stromal proliferation, inflammatory lesions, and neoplasms [23]. Breast cancer incidence increased from 12.7 million

in 2008 to 14.1 million in 2012, and this trend is predicted to increase in the future [24] [25]. It was estimated that worldwide over 508,000 women died in 2011 due to breast cancer [26]. Breast cancer survival rates vary greatly worldwide, ranging from 80% or over in North America, Sweden, and Japan to around 60% in middle-income countries and below 40% in low-income countries [27].

The current study aimed to assess the pattern of different breast diseases recorded for females in the south-western region, Saudi Arabia, during the period from January 2018 to January 2020. Also, the study aimed to assess the type of diagnostic and management methods with the clinical outcome. The study revealed that the majority of cases aged below 30 years and were married and still menstruating. Many risk factors for having breast diseases were recorded, including receiving oral contraceptive pills, hormonal therapy, positive family history, and irregular breast examination, especially at the age above 40 years. Breast mass was the most frequent complaint with breast pain with its size ranging from 2 - 5 cm in most cases and irregular margins in nearly half of the cases associated with Axillary lymph nodes in about 1 out of each 3 cases. Final pathology after a biopsy revealed that lesions were benign among two-thirds of the cases especially fibroadenoma, which is the most benign breast lesion. Regarding surgical intervention, modified radical mastectomy was needed for 1 out of each 5 cases, while only 11% of the cases undergone lumpectomy as the lesions were benign. Most of the cases had no post-operative complications less than 10% had seroma.

Generally, these findings were consistent with most of the literature. A study was conducted to assess benign breast lesions (BBD) in an African population [28] and recorded an increasing incidence of these benign lesions. The overall mean age for BBD was 27.5 years, SD ± 11.3, with an age range of 9 - 84 years and a peak age occurrence in the third decade. The single most common lesion was fibroadenoma accounting for 43.1% of cases, followed by fibrocystic change (23.8%). A second study was conducted by Ayoade BA *et al.* 2012 [29] to Clinical Features and Pattern of Presentation of Breast Diseases in Surgical Outpatient Clinic of a Suburban Tertiary Hospital in South-West, Nigeria. The researchers reported that the commonest symptoms were breast lump in 91.7% patients, and breast pain in 23.1% patients. Forty four patients (36.3%) had a malignant disease, seventy patients (57.8%) had benign breast diseases, and seven were normal. Fifty nine of the 70 benign diseases were fibroadenoma. In India, Hatim K *et al.* 2017 [30] conducted a research to assess Patterns and prevalence of benign breast disease in Western India. The reported that the commonest benign breast lesion was fibroadenoma (77.62%), followed by fibrocystic disease (4.3%) and gynaecomastia (4.3%).

Locally, Samir S *et al.* 1995 conducted a study to the spectrum of breast diseases in Saudi females [31]. The researchers reported that fibroadenoma was the most common lesion encountered 30.7%, followed by fibrocystic condition (21.1%), carcinoma (14.9%), acute mastitis (7.2%), duct ectasia (4.9%), lactational ade-

noma (4.8%), intraductal papilloma (2.6%), galactocele (2.4%) and several less frequent lesions. A second study was conducted to assess histopathological patterns of breast lesions in Northern Saudi Arabia, 2017 [32]. The study revealed that 23.2% of the lesions were ductal carcinoma, 4.4% were lobular carcinoma, 1.9% were mixed tumours, while 64.6% were fibroadenoma.

When local breast disease distribution patterns are known, skills related to diagnosis and management can be made with a sound degree of certainty. In addition, resource allocation and planning can be better allied. This is true mainly in low income countries where a large population of individuals may not afford diagnostic and management costs.

6. Conclusion and Recommendations

In conclusion, benign breast diseases (BBD) were the most recorded among Najran females, especially fibroadenoma, with low post surgical complications. The better reporting system should be initiated, and well training for the physicians is mandatory to improve the quality of available data, and research based on these data and achieve better and more realistic conclusions for planning and resource allocation.

Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics and Research Committee of the College of Medicine of Najran University.

Limitations of the Study

Irrespective of the variety of collected clinical data in the current study, but there were two main limitations. The first is the sample size, which was due to reviewing only 2 years' cases, but this was due to a poor recording system, which somewhat primitive. The second was the high missing rate in the data for the cases, which also related to the primitive recording system and lack of physician's experience regarding these cases management guidelines.

Authors' Contributions

Conceptualization, Abdulrahman Manaa sultan Alamri; methodology, Abdulrahman Manaa sultan Alamri, Saeed Ali Alsareii; data curation, Hajr Hassan Al-Wadei, Awad Mohammed Al-Qahtani, Salem Ali Alatef Sultan, Sara Ali Alshamrani, Ahmed Hamzah Almakrami, Abdullah Ahmed Daiel; writing original draft preparation, Ahlam Yahya Alyami, Ashwaq Mousa Hommadi, Yagoub Mohammed Tahir Ali; funding acquisition, All participants. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Cosgrove, D.O., Kedar, R.P., Bamber, J.C., Al-Murrani, B.A., Davey, J.B., Fisher, C., McKinna, J.A., Svensson, W.E., Tohno, E. and Vagios, E. (1993) Breast Diseases: Color Doppler US in Differential Diagnosis. *Radiology*, **189**, 99-104. https://doi.org/10.1148/radiology.189.1.8372225

[2] Salzman, B., Fleegle, S. and Tully, A.S. (2012) Common Breast Problems. *American Family Physician*, **86**, 343-349.

[3] Hatim, K.S., Laxmikant, N.S. and Mulla, T. (2017) Patterns and Prevalence of Benign Breast Disease in Western India. *International Journal of Research in Medical Sciences*, **5**, 684-688. https://doi.org/10.18203/2320-6012.ijrms20170174

[4] Aslam, H. M., Saleem, S., Shaikh, H. A., Shahid, N., Mughal, A. and Umah, R. (2013) Clinico-Pathological Profile of Patients with Breast Diseases. *Diagnostic Pathology*, **8**, 77. https://doi.org/10.1186/1746-1596-8-77

[5] American Cancer Society. Atlanta: American Cancer Society. Breast Cancer Facts and Figures. https://www.cancer.org/research/cancer-facts-statistics/breast-cancer-facts-figures.html

[6] Okoth, C., Galukande, M., Jombwe, J. and Wamala, D. (2013) Benign Proliferative Breast Diseases among Femalepatients at a Sub Saharan Africa Tertiary Hospital: A Cross Sectional Study. *BMC Surgery*, **13**, 1-9. https://doi.org/10.1186/1471-2482-13-9

[7] Chalya, P.L., Manyama, M., Rambau, P.F., Kapesa, A., Ngallaba, S.E., Masalu, N. and Mabula, J.B. (2016) Clinicopathological Pattern of Benign Breast Diseases among Female Patients at a Tertiary Health Institution in Tanzania. *Tanzania Journal of Health Research*, **18**, 1.

[8] Clavel-Chapelon, F. and Gerber, M. (2002) Reproductive Factors and Breast Cancer Risk. Do They Differ According to Age at Diagnosis? *Breast Cancer Research and Treatment*, **72**, 107-115. https://doi.org/10.1023/A:1014891216621

[9] Coriaty Nelson, Z., Ray, R.M., Gao, D.L. and Thomas, D.B. (2002) Risk Factors for Fibroadenoma in a Cohort of Female Textile Workers in Shanghai, China. *American Journal of Epidemiology*, **156**, 599-605. https://doi.org/10.1093/aje/kwf094

[10] Gukas, I.D., Jennings, B.A., Mandong, B.M., Igun, G.O., Girling, A.C., Manasseh, A.N., *et al.* (2005) Clinicopathological Features and Molecular Markers of Breast Cancer in Jos. *West African Journal of Medicine*, **24**, 209-213. https://doi.org/10.4314/wajm.v24i3.28220

[11] Anyanwu, S.N. (2000) Fibro-Adenoma of the Breast in Nigerian Igbos. *South African Medical Journal*, **90**, 1223-1226.

[12] Ntekim, A., Nufu, F.T. and Campbell, O.B. (2009) Breast Cancer in Young Women in Ibadan, Nigeria. *Afr Health Sci.*, **9**, 242-246.

[13] Saunders, C.M. and Baum, C. (2000) The Breast in Bailey and Love's Short Practice of Surgery. In: Russell, R.C., Williams, N.S. and Bulstrode, C.J., Eds., *Bailey and*

Love's Short Practice of Surgery, 23rd Edition, Arnold, London, 750-752.

[14] Chiedozi, L.C., El-Hag, I.A. and Kollur, S.M. (2003) Breast Diseases in the Northern Region of Saudi Arabia. *Saudi Medical Journal*, **6**, 623-627.

[15] Jamal, A.A. (2001) Pattern of Breast Diseases in a Teaching Hospital in Jeddah, Saudi Arabia. *Saudi Medical Journal*, **2**, 110-113.

[16] Adesunkanmi, A.R. and Agbakwuru, E.A. (2001) Benign Breast Diseases at Wesley Guild Hospital, Ilesha Nigeria. *West African Journal of Medicine*, **2**, 146-151.

[17] Chaudhuri, M., Sens, S. and Sengupta, J. (1995) Breast Lumps: A Study of 10 Years. *Journal of the Indian Medical Association*, **12**, 455-457.

[18] Adeniji, K.A., Adelusola, K.A. and Odesanmi, W.O. (1997) Benign Disease of the Breast in Ile-Ife: A 10 Year Experience and Literature Review. *Central African Journal of Medicine*, **5**, 140-143.

[19] Mansoor, I. (2001) Profile of female breast lesions in Saudi Arabia. *Journal of Pakistan Medical Association*, **7**, 243-247.

[20] Yusufu, L.M., Odigie, V.I. and Mohammed, A. (2003) Breast Masses in Zaria, Nigeria. *Annals of African Medicine*, **2**, 13-16.

[21] Ochicha, O., Edino, S.T., Mohammed, A.Z. and Amin, S.N. (2002) Benign Breast Lesions in Kano. *Nigerian Journal of Surgical Research*, **4**, 1-5. https://doi.org/10.4314/njsr.v4i1.12162

[22] Anyikam, A., Nzegwu, M.A., Ozumba, B.C., Okoye, I. and Olusina, D.B. (2008) Benign Breast Lesions in Eastern Nigeria. *Saudi Medical Journal*, **29**, 241-244.

[23] Tavassoli, F.A. and Devilee, P. (2003) World Health Organization Histological Classification of Tumours of the Breast in Pathology and Genetics of Tumours of the Breast and Female Genital Organs. IARC, France.

[24] International Agency for Research on Cancer (2008) Cancer Incidence and Mortality World Wide. International Agency for Research on Cancer. IARC Cancer, Lyon. https://www.iarc.fr/wp-content/uploads/2018/07/pr223_E.pdf

[25] Ferlay, J., Shin, H.R., Bray, F., Forman, D., Mathers, C. and Parkin, D. (2013) Cancer Incidence and Mortality Worldwide. International Agency for Research on Cancer, Lyon, France, 120-163.

[26] World Health Organization (2013) Global Health Estimates. World Health Organization, Geneva.

[27] Sun, J., Chen, X., Wang, Z., Guo, M., Shi, H., Wang, X., Cheng, L. and Zhou, M. (2015) A Potential Prognostic Long Non-Coding RNA Signature to Predict Metastasis-Free Survival of Breast Cancer Patients. Scientific Reports, 9 November 2015, 5, 16553. https://doi.org/10.1038/srep16553

[28] Olu-Eddo, A.N. and Ugiagbe, E.E. (2011) Benign Breast Lesions in an African Population: A 25-Year Histopathological Review of 1864 Cases. *Nigerian Medical Journal: Journal of the Nigeria Medical Association*, **52**, 211. https://doi.org/10.4103/0300-1652.93790

[29] Ayoade, B.A., Tade, A.O. and Salami, B.A. (2012) Clinical Features and Pattern of Presentation of Breast Diseases in Surgical Outpatient Clinic of a Suburban Tertiary Hospital in South-West Nigeria. *Nigerian Journal of Surgery*, **18**, 1.

[30] Hatim, K.S., Laxmikant, N.S. and Mulla, T. (2017) Patterns and Prevalence of Benign Breast Disease in Western India. *International Journal of Research in Medical Sciences*, **5**, 684-688. https://doi.org/10.18203/2320-6012.ijrms20170174

[31] Amr, S.S., Sa'di, A.R., Ilahi, F. and Sheikh, S.S. (1995) The Spectrum of Breast Dis-

eases in Saudi Arab Females: A 26 Year Pathological Survey at Dhahran Health Center. *Annals of Saudi Medicine*, **15**, 125-132. https://doi.org/10.5144/0256-4947.1995.125

[32] Ahmed, H.G., Al-Shammeri, K.J., Alrashidi, A.G., Alrashedi, S.A., Alenazi, F.S., Seada, L.S. and Ashankyty, I.M. (2017) Histopathologic Patterns of Breast Lesions in Northern Saudi Arabia. *International Journal of Medical Research & Health Sciences*, **6**, 54-64.