ORIGINAL ARTICLE

Breast cancer in Accra, Ghana

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The aim of this study was to look at the pattern of breast cancer over a period of five years and to compare the findings to similar studies done in the Department and elsewhere within the African sub-region. All breast cancers diagnosed in the Department of Pathology of the Korle Bu Teaching Hospital, Accra, over a 5-year period were compiled. The slides for the cases were retrieved and reviewed. Invasive ductal carcinomas were graded according to the Scarff-Bloom-Richardson's grading system. The data were entered and analyzed using the EPI-Info microcomputer software (Version 3.5.1, 2008, Center for Disease Control and Prevention (CDC) Atlanta). Breast cancer in Accra is mostly of the ductal type or its variants affecting relatively younger age groups. The mean age of incidence of cancer in Ghana is 48 years, and about 67% have lymph node metastases (at least Stage II or N1) and 74% are of high grade at the time of diagnoses. The percentage of male breast cancers in Ghana is 2.9% (2.0 - 3.75% within the West African sub-region) and is higher than what is reported in Western literature. The results of this study show that there has been no improvement in the stage at which patients present with breast cancer in the past 30 years.
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INTRODUCTION

Breast cancer is the commonest malignancy and a leading cause of cancer mortality in women in many parts of the world, with overall cancer burden of more than ten million cases and nearly six million deaths occurring worldwide annually (Sasco, 2003). In 2008, about one million four hundred women were diagnosed with the disease with a corresponding 460,000 deaths globally (Abdulrahman and Rahman, 2012; Ferlay *et al.,* 2010). Breast cancer has been identified as the commonest cause of cancer death in women in Ghana (Wiredu and Armah, 2006) as well as in Nigeria (Adebamawo and Ajayi, 2000).

The peak age of incidence in Africans occurs in the premenopausal period (Adesunkami *et al.,* 2006; Rambau *et al.,* 2011) while it occurs at the postmenopausal period in whites (Public Health Wales NHS

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Trust, 2010; Cancer Registry of Norway, 2011; Finish Cancer registry, 2011). A study on surgical pathology specimens in Ghana in 1979 showed that the disease also occurred more commonly between 36-45 age groups (Anim, 1979). Unlike white women, West-African and African-American women present late for treatment with a greater cancer burden and consequently lower survival rates (Ijaduola and Smith, 1998; Rambau *et al.,* 2011). The mortality rate in sub-Saharan Africa is disproportionately high compared with the incident rate (Gakwaya *et al.,* 2008; Fregene, 2005).

Male breast cancer (MBC) is an uncommon disease accounting for about 1% of all breast cancers diagnosed in the United States each year (Sasco, 2003, IARC, 2003). In contrast to the recent decline in incidence of female breast cancer (FBC), the incidence of MBC has been steadily increasing over the past three decades (Ahmed *et al.,* 2012). In Ghana, Akosa *et al.,* (1999) found the frequency of male cancers to be 2.4%, with a male:female ratio of 1:40 compared to an estimated value of 1% in Western literature (Sasco, 2003, IARC, 2003). Similar high

figures were seen elsewhere within the West African sub-region - 2% in Ile-Ife (Adeniji *et al.,* 1997), 2.4% in Lagos (Ajayi *et al.,* 1982), and 3.75%, in Ibadan (Ihekwaba, 1994).

There has been changing trends in the pattern of breast cancers in the developed world. Breast cancer is mainly a disease of elderly women but it apparently seems to occur in relatively younger females in women of African descent. The study was undertaken to see if the pattern of breast diseases has changed over the past thirty years since the last study in the Department of Pathology of the Korle Bu teaching Hospital, Accra, over thirty years ago (Anim, 1979) and to describe the types and nature of breast cancer over a 5-year period. The study also observed the percentage of male breast cancers diagnosed in the department.

MATERIALS AND METHODS

This retrospective study was conducted in the Department of Pathology of the Korle Bu Teaching Hospital, Accra, Ghana. All cases of breast cancer diagnosed from January 2000 to December 2004 were retrieved from the Departmental files. The data collected included biopsy number, age of patient, sex, histological diagnoses and lymph node status. The lymph node status was assessed as positive (NI), negative (No) or not known (Nx).

All histological slides for the cases were also retrieved and reviewed to confirm the diagnoses. Invasive ductal carcinomas were graded according to the Scarff-Bloom-Richardson's grading system where tubule formation, nuclear pleomorphism and mitotic rate within the tumour were evaluated (Tavasolli, 1992). In cases where the slides were of poor quality or could not be traced, the paraffin blocks were retrieved, the tissue re-embedded where necessary and new slides were prepared. The results were entered into a database and analyzed using the EPI-Info microcomputer software (Version 3.5.1, 2008, Center for Disease Control and Prevention (CDC) Atlanta). The p-values were calculated where applicable and p-values less than 0.05 was considered statistically significant. These results were presented in tabular form and as charts.

RESULTS

A total of 34,764 surgical specimens were received during the study period. Of these, 3,929(11.3%) were breast lesions. Out of the 3,929 breast lesions, 821(20.9%) were cancers. The age range of the patients is 14-91 years with a median of 48 years. Most, (783, 94%) of the cancers cases occurred after the age of 29 years (Figure 1). Breast cancer in both sexes is rare (0.5%) below 20 years. There were only two cases of non-Hodgkin's lymphoma and one case of malignant phyllodes tumour that were seen. Breast cancers of all histological types in both sexes are most common in the age group 40-49 years, followed by the 50-59 years age group and then in those above 60 years (Figure 1). Most cancers (97.1%) were found in women with only 24 (2.9%) in males, giving a female:male ratio of 33.2:1.
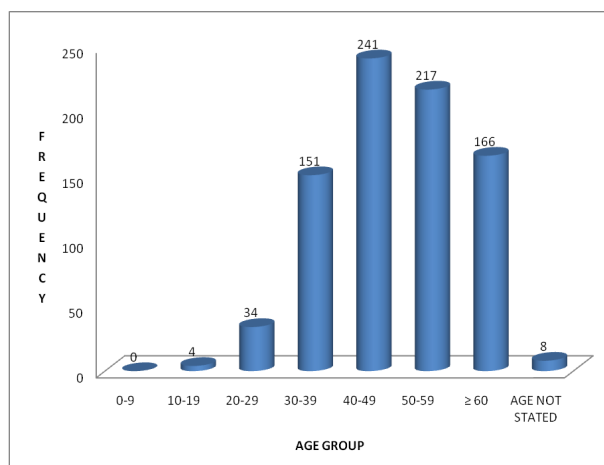
Figure 1: Age characteristics of breast cancers in Accra

Ductal type represents the most common (90.1%) breast cancer cases followed by lobular carcinomas (3.9%) (Table 1). The ductal to lobular ratio is 23.1:1. Of the specific sub-types of ductal carcinoma, the most common is the mucinous subtype (2.6%), followed by papillary (1.0%), medullary (0.9%) and tubular (0.3%) (Table 1). The histological types grouped as others included spindle cell carcinoma, signet ring cell carcinoma, residual and necrotic malignant cells. Paget's disease is 1.7% and squamous cell carcinoma is 1.5%. Malignant phyl-

lodes tumours and Non-Hodgkin's Lymphomas (NHL) are about 1.0% each (Table 1). The subtypes of ductal carcinoma and Paget's disease are all rare under 30 years. Sarcomas are classified together with malignant phyllodes in this study.

The gender and age distribution of the types of breast malignancies seen are shown in Tables 1 and 2 respectively. The subtypes of ductal cancers are 6.7% of all the cancers and are more common than lobular carcinoma. Malignant breast tumours of all kinds are most common in the age group 40-49 years (Table 2). Almost all (94.4%) cancers occur after age 29 years. Most (65.6%) of the cases of lobular carcinoma and Paget's disease (69%) occur in the 40-49 year age group. Ductal carcinoma has a peak age group also at 40-49 years with 30.1% of the lesions, and 25.9% in 50-59 year group and 20.5% at 60 years and above. Malignant phyllodes are more common after age 50 years, where most (57.1%) of them occur (Table 2).

Table 1: Histological Characteristics of male and female breast cancers

Type of Cancer	Female (N/%)	Male (N/%)
Ductal(NOS)	673(84.4)	19 (79.0)
Lobular	32(4.0)	0 (0.0)
Mucinous	21(2.6)	1 (4.2)
Papillary	8(1.0)	1 (4.2)
Medullary	7(0.9)	0 (0.0)
DCIS	2(0.30	0 (0.0)
Tubular	2(0.3)	0 (0.0)
Pagets disease	13(1.6)	0 (0.0)
Squamous Cell carcinoma	10(1.3)	1 (4.2)
Malignant Phyllodes	7(0.9)	0 (0.0)
NHL	6(0.8)	1 (4.2)
Hodgkins Disease	1(0.1)	0 (0.0)
Others	14(1.80	1 (4.20)
Total	797(100.0)	24 (100.0)

Table 2: Age (years) distribution of malignant breast neoplasms

Malignant lesion	0-9	10-19	20-29	30-39	40-49	50-59	>60	Not stated
Lobular	0	0	1	4	11	10	6	0
Ductal(nos)	0	0	27	132	201	180	146	6
Mucinous	0	0	0	3	12	5	1	0
Papillary	0	0	0	1	1	3	3	1
Medullary	0	0	0	0	5	2	0	0
Comedo	0	0	0	0	2	0	0	0
Tubular	0	0	1	0	0	0	1	0
Paget's	0	0	0	4	0	5	4	0
Sq.cell ca	0	0	2	0	4	5	1	0
Malignant phyllodes	0	1	1	1	0	2	2	0
Nhl	0	2	1	4	0	0	0	0
Hodgkins	0	0	0	0	1	0	0	0
Others	0	1	1	2	4	5	2	1
Total	0	4	34	151	241	217	166	8

The axillary lymph node status was available for 358 (43.6%) of the cases. Of these, most (67.0%) had cancer metastases and 33.0% had no metastases at the time of diagnoses. Most **(**4 out of 5, 80%), of the males with known lymph node status had axillary node involvement. There are significant differences between the axillary lymph node statuses between the sexes (Table 3).

Table 3: Axillary Lymph Node Involvement in male and female breast cancers

LN status	Male	Female
Positive (NI)	4	236
Negative (NO)	1	117
*P value	0.021	0.000
Not stated (Nx)	19	434
Total	24	787

P values are generated from comparing the positive to the negative lymph node in male and female

Seven hundred and thirty four cases of invasive ductal carcinomas had the following grading; grade I - 26.0%, grade II - 36.5%, and grade III - 37.5%. Most (74.0%) of all ductal carcinomas were high grade (II and III). There are significant statistical differences between the frequency and grades of the breast cancers (Table 4).

Table 4: Histological grade of breast cancers

Grade	Frequency n(%)	Prevalence ratio
Low (I)	193(26)	1.00
High (II & III)	541(74)	2.83

Male breast cancers (MBC) represent 2.9% of all the breast cancers. Most (87.5%) of the cancers in males were ductal carcinomas. No lobular carcinoma was seen in males. Four (80%) of the five cases for which the lymph nodes status were known had metastases in them at the time of diagnoses. The age distribution was similar to that in all the cancers with the peak age of 40-48 years.

DISCUSSION

In the present study, breast cancer constituted 20.9% of all breast lesions. In an earlier study in the Department, the proportion was 24.0% (Anim, 1979). Most of the cancers occur in the 40-49 year age-groups similar to that observed in 1979 in the Department (Anim, 1979). The median age of breast cancer in this study is 48 years. The mean age of a study in Kumasi, Ghana, on breast cancer is also 48 years, (Stark *et al.,* 2010) and from Tanzania is 47.8 years (Rambau *et al.,* 2011). The mean age in a study from Nigeria is 42.6 years (Adebamawo, 2000). The median age of incidence in Black women is 46 years compared to 67 years in white British women (Bowen *et al.,* 2008). The reasons for the racial difference are not entirely clear from this study and may warrant further study. Ductal carcinoma and its specific types are the most common cancer, similar to that of earlier studies in the same institution and other studies in the sub-region *(*Anim, 1979; Anyanwu, 2000).

The higher percentage of lymph node involvement in the present study is similar to those seen in other studies from the African sub-region (Anyanwu*,* 2000; Rambau *et al.,* 2011). In Africa, most breast cancers present at advanced stages (Anyanwu*,* 2000; Rambau *et al.,* 2011). In Eastern Nigeria, it is reported that only 7% of women report a breast lump within one year of its discovery, while 15% report it one year or more after the detection (Anyanwu*, 2000).* Most (2/3) of the cancers for which the nodal status was known were at advanced stages (at least stage II or N1), at the time of diagnosis in a study (Autier *et al.,* 2011). Lymph node status is the single most important prognostic factor in the management of breast cancer. Rambau *et al.,* (2011) reported from Tanzania that 70.4% of their cases had lymph node involvement at the time of diagnosis, while 64% were in stage IIB, findings similar to that observed in this study.

The finding that most (70.4%) of the cancers are of high grade (grades II and III) confirm earlier findings in Africans (Gakwaya *et al.,* 2008) at the time of diagnosis. A study showed that most (90.4%) cancers in Uganda were high grade (Gakwaya *et al.,*

2008). In an international study, 76% of breast cancers in Ghanaians were (grade III) poorly differentiated (Stark *et al.,* 2010). Our study shows that only 37% of breast cancers are poorly differentiated, unlike the 58% (Rambau *et al.,* 2011) and 45.1% (Ikpatt *et al.,* 2002) reported in Uganda and Nigeria respectively. However, overall, breast cancers are of high grades in Africans than in Caucasians where the proportions of high grade cancers are low, 29.3% (Stark *et al.,* 2010*)* and 15.8% (Ikpatt *et al.,* 2002). The finding that most of the cancers are of higher grades and are at advanced stages at the time of presentation means poorer overall prognosis for the patients.

The percentage of male breast cancer in this study (2.9%) is similar to the 2.4% reported by *Akosa et al., (*1999) in the same department in an earlier study. Most of the male cancers in this study are ductal carcinoma and its variants, and the findings are similar to the earlier study. However no lobular carcinoma is seen in the present study as opposed to the earlier one. Male breast cancers vary between 2.0 and 3.75% as against 1.0% reported in Western literature (IARC, 2003). There is therefore a higher percentage of male breast cancer in the West African sub-region from these studies.

CONCLUSION
The results of this study show that there has been no improvement in the stage at which patients present with breast cancer over the past 30 years. Breast cancers are still presented at advanced stages. Most of the cancers are of ductal and its sub-types. Majority of cancers occur in a relatively younger age group (40-48 years) with a median age of incidence at 48 years. About 67% have lymph node metastases (at least Stage II or NI) and 74% are of high grade at the time of diagnoses. The percentage of male breast cancers in Ghana is 2.9% (2.0-3.75% within the West African sub-region) is higher than what is reported in Western literature.

COMPETING INTERESTS
The authors declare that they have no competing interests.

REFERENCE
Abdulrahman GO and Rahman GA (2012). Epidemiology of breast cancer in Europe and Africa. Journal of Cancer Epidemiology; doi: 10.1155/2012/915610.

Adebamawo CA and Ajayi OO (2000). Breast cancer in Nigeria. West Afr J Med. 19: 179-191

Adeniji KA, Adekysika KA, Odensanmi WO, Fadiran OA (1997). Histopathological analysis of carcinoma of the male breast in Ile-Ife, Nigeria. East Afr Med J' 74: 455-457.

Adesunkanmi ARK, Lawal OO ,Adelusola KA,and Durosimi MA (2006), "The severity, outcome and challenges of breast cancer in Nigeria,"Breast.15 (3) . 399–409.

Ahmed A, Ukwenya Y, Abdullahi A, Muhammad I (2012). Management and outcomes of male breast cancer in Zaria, Nigeria. Int J Breast Cancer. 2012; 845143. Epub 2012 Sep 6.

Ajayi DOS, Osegbe DN, Ademuluyi SA (1982). Carcinoma of the male breast in West Africans and a review of the literature. Cancer. 50: 1664-1667.

Akosa AB, Ampadu FO, Tettey Y (1999). Male breast cancers in Ghana. Ghana Med J. 33: 3-8.

Anim JT (1997). Breast diseases - review of surgical material in Korle-Bu Teaching Hospital, 1977-1978. Ghana Med J. 18: 30-33.

Anyanwu SN (2000): Breast cancer in eastern Nigeria: a ten year review. West Afr J Med. 19: 120-125.

Autier P, Boniol M, Middleton R, Doré J.-F, Héry C, Zheng T *et a*l (2011). Advanced breast cancer incidence following population-based mammographic screening. Ann Oncol. doi: 10.1093/annonc/mdq633

Bowen RL, Duffy SW, Ryan DA, Hart IR, and Jones JL (2008). "Early onset of breast cancer in a group of British black women. British Journal of Cancer. 98, (2), 277–281.

Cancer Registry of Norway, Cancer Registry of Norway, Cancer in Norway (2011): Cancer in Norway 2009 – Cancer incidence, mor-

tality, survival and prevalence in Norway , Cancer Registry of Norway, Oslo, Norway..

Ferlay JH, Shin R, Bray F, Forman D, Mathers C, and Parkin DM (2010). Cancer Incidence and Mortality Worldwide. I"GLOBOCAN 2008 vo1.2, ARC Cancerbase No, 10," International Agency for Research on Cancer, Lyon, France.

Finnish Cancer Registry, Cancer stat fact sheets 2011) , Institute for Statistical and Epidemiological Cancer Research, Helsinki, Finland.

Fregene A and Newman LA (2005). Breast cancer in sub-Saharan Africa: how does it relate to breast cancer in African-American women? Cancer. 103(8): 1540–1550.

Gakwaya A, Kigula-Mugambe JB, Kavuma A, Luwaga A, Fualal J, Jombwe J, Galukande M and Kanyike D(2008). Cancer of the breast: 5-year survival in a tertiary hospital in Uganda. British Journal of Cancer. 99: 63 – 67.

IARC, WHO. Breast cancer (2003), in Stewart B, Kleihues P (eds). World Cancer Report. Lyon: IARC Press, 188–190.

Ihekwaba FN (1994). Breast cancer in men in black Africa: A report of 73 cases. Jr Coll Surg Edinb. 344-347.

Ijaduola TG, and Smith EB (1998). Pattern of Breast Cancer among White-American, African-American, and Nonimmigrant west-African women. J Natl Med Assoc; 90: 547-551.

Ikpatt OF, Kuopio T, Ndoma-Egba R and Collan Y (2002). Breast cancer in Nigeria and Finland: epidemiological, clinical and histological comparison. Anticancer Res; 22(5): 2005 – 3015.

Public Health Wales NHS Trust (2010), "WCISU Annual Publication No. SA10/01: Cancer Incidence in Wales 2004–2008," Welsh Cancer Intelligence and Surveillance Unit, Cardiff , UK, 2010, http://www.wales.nhs.uk/sites3/Documents/242/incpub.

Rambau PF, Chalya Pl, Manyama MM and Jackson KJ (2011). Pathological features of Breast Cancer seen in Northwestern Tanzania: a nine years retrospective study. BMC Research Notes. 4: 214, 1-6.

Sasco AJ (2003). Breast cancer and the environment. Horm Res. 60 Suppl3:50

Stark A, Kleer CG, Martin I, Awuah B, Nsiah-Asare A, Takyi V, Braman M, Quayson SE, Zarbo R, Wicha M, Newman L (2010). African Ancestry and Higher Prevalence of Triple-Negative Breast Cancer: Findings from an International Study. Cancer. November 1; 116(21): 4926–4932.

Tavasolli FA (1992). General considerations (tumour grade) in Tavasolli FA (Ed) Pathology of the breast. Cennecticut. Appleton and Plange. 36

Wiredu EK, Armah HB (2006). Cancer mortality patterns in Ghana: a 10-year review of autopsies and hospital mortality. *BMC Public Health*. 6:159. doi:10.1186/1471-2458-6-159.