Research Article

Trends in The Patterns of Cancers in Nigerian Women Over Five Decades

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ABSTRACT
Cancers are major contributors to mortality among women in developing countries, with patterns changing over time. This study was done to ascertain the changes in trends and patterns of breast, cervical and ovarian cancers in women over two periods of one decade each, thirty-five years apart. Data on breast, cervical and ovarian cancers in Nigerian women over the two ten-year periods were obtained from the Ibadan Cancer Registry, using a well-structured proforma with extraction of information such as age, cancer sites and year of presentation. The extracted data were analyzed and related to information provided by the International Agency for Research on Cancer (IARC). There were about 400 cases of breast, cervical and ovarian cancers from 1960 to 1969 with cervical cancer having the highest relative frequency, while about 3000 cases of these cancers were reported from 2004 to 2013, with breast cancer having the highest ratio frequency. The age group with the highest frequencies for the three cancer types from 2004 to 2013 was 40 - 49 years, while it was 60 – 69 years from 1960 to 1969. Mean ages at presentation were 48.96 ± 13.32, 54.40 ± 13.41 and 44.42 ± 16.99 years for breast, cervical and ovarian cancers respectively. Breast and cervical cancers are the two commonest cancers in Nigerian women over the five-decade period, with breast cancer overtaking cervical cancer as the most frequently diagnosed. The number of cancer cases recorded increased seven-fold and the peak age group at diagnosis of breast cancer dropped by about twenty years over the period.

Keywords: *Cancer, Breast, Cervical, Ovarian, Women*

INTRODUCTION

Cancer is globally one of the most dreaded non-communicable diseases and an important contributor to the global burden of diseases (Parkin *et al,* 2005). Low- and middle-income countries account for up to 80% of the world population and are experiencing a shift in disease burden from infectious to non-communicable diseases (epidemiological transition). A very important example in this regard is cancer which was found to be responsible for more than 29% of non-communicable disease deaths in 2001 (Omran 2005). This change has been attributed to evolving lifestyle risks factors for cancers including smoking, alcohol consumption, excess body weight through changes in diet and physical activity (McCormack and Boffetta, 2011).

Estimates suggest that about 12.5% of all deaths are attributable to cancer and approximately 17.5 million cases of cancer were diagnosed worldwide in 2015, with more than two-thirds of these being in developing countries (Global Burden of Disease Cancer Collaboration, 2017). Previous studies have reported different types of cancers among Nigerian women (Adebamowo and Ajayi, 2000; Adetifa and Ojikutu, 2009; Yakasai *et al*, 2013) and breast cancer in women has been identified as a major public health problem in both developing and developed countries (Parkin *et al,* 2005; Ferlay *et al*, 2012; Jemal *et al*, 2011).

In a study conducted among women in Lagos State, Nigeria; an increased incidence of breast cancer was attributed to the increased awareness and education of females, as well as early presentation and interventions (Adetifa and Ojikutu, 2009). In similar studies done in the South-Eastern and the Northern part of Nigeria, it was found that cervical cancer was the predominant type of cancer in women (Yakasai *et al*, 2013; Megafu, 2004). It was reported that the most important aetiological factors contributing to cervical cancer in these women were early marriages, early age of initiating coitus, low socio-economic status (especially in the Northern part of the country) and grand multiparity (Yakasai *et al*, 2013). This

pattern of cervical cancer predominance in the Northern part of Nigeria was also found in studies done in Jos (1995-2002) and Kano (1995-2004).

Previous studies on cancers in Nigerian women have focused majorly on both incidence and prevalence of different types of cancers with little attention to temporal patterns and trends of cancer occurrence in Nigeria. Information on patterns and trends will be helpful in identifying the most prevalent cancers and could as well inform planning for appropriate interventions in the affected population. The aim of the present study is to compare trends and patterns of breast, cervical and ovarian cancers in women over two 10-year periods, thirty-five years apart (1960 – 1969 and 2004-2013), using data in the Ibadan Cancer Registry.

MATERIALS AND METHODS

Study Design: This was a descriptive study looking at registered cases of cancer among women between 1960 – 1969 and 2004 – 2013, extracting data from the Ibadan Cancer Registry.

Study Area and Setting: The research was carried out at the Ibadan Cancer Registry, University College Hospital, Ibadan, Nigeria. Although the University College Hospital, Ibadan (UCH) was opened in 1957, the Cancer Registry started work in 1960. The UCH is the oldest purpose-built, and one of the largest teaching hospitals in West Africa, with nearly 1000 bed spaces and it is located in Oyo State, South Western Nigeria.

The Cancer Registry in the Department of Pathology within the facility registers both benign and malignant tumors and also provides services to other secondary and tertiary facilities within the health service catchment area in Nigeria. It is classified as a population-based cancer registry because of its catchment area

Sampling Method: All cancers with a histological diagnosis identified in the cancer register were included in the study. Cancers without a histological diagnosis, benign tumors, and cancers in males that are recorded in the cancer register were excluded.

Data Collection and Management Procedure: Data were extracted and analyzed to demonstrate the changes in the patterns of cancers diagnosed in women between 1960 – 1969 and 2004 - 2013, a period of 2 distinct decades, separated by thirty-five years. A validated structured proforma was used to retrieve data and information which included the ages of the women, the cancer sites and year of presentation. The data obtained were entered into Microsoft Excel spread sheet, edited for outliers and any inconsistencies, and transferred to IBM SPSS statistics version 20 for analysis.

Data Analysis: The extracted data were analyzed to determine the annual numbers of cases of cancer. The patterns in the mean ages of the patients for the most common cancer sites were also determined. Descriptive statistics including frequency, percentage, mean, standard deviation and a trend chart were used to present the results.

Ethical Considerations: Ethical approval was sought and obtained from the UI/UCH Ethics Committee, College of Medicine, University of Ibadan, Nigeria, with ethics approval number UI/EC/15/0277. The records at the Ibadan Cancer Registry were accessed with permission from the relevant authorities. The data obtained were kept strictly confidential. Serial numbers were used in place of patient's names, appropriate coding was done and the data were used for academic purposes only.

RESULTS

There were a total of 3,128 cases of cancer of the breast, cervix and ovary recorded over the 10 year period from 2004 to 2013, compared to only 428 cases recorded from 1960 to 1969. Between 1960 and 1969, there were 189 cases of cervical cancer, 157 cases of breast cancer and 82 cases of ovarian cancer. From 2004 to 2013, the highest number of cases recorded was for breast cancer (1750), followed by cervical cancer (1114) while there were 264 ovarian cancer cases. The preponderance of cervical cancer between 1960 and 1969, and its being overtaken by breast cancer as the most commonly registered cancer between 2004 and 2013 is illustrated in Figure 1.
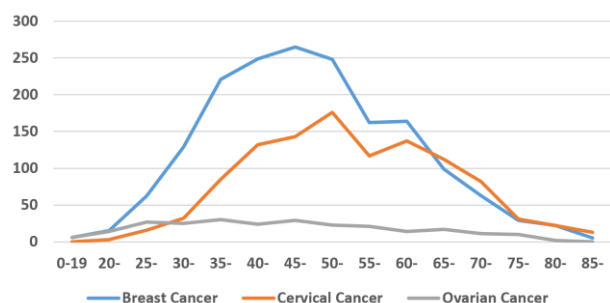
The age distribution of the patients over the two time periods are shown in Figures 2a and 2b.
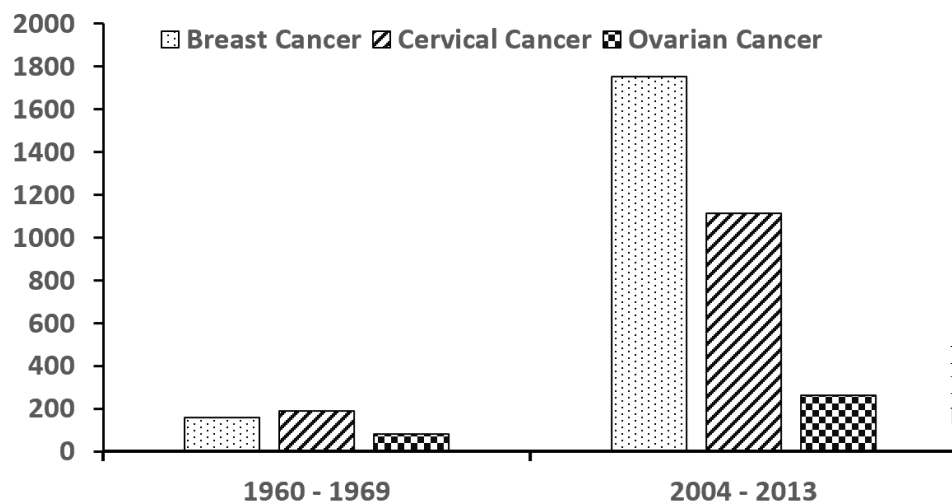
Figure 1.
Number of cancer cases recorded between 1960-1969 and 2004-2013
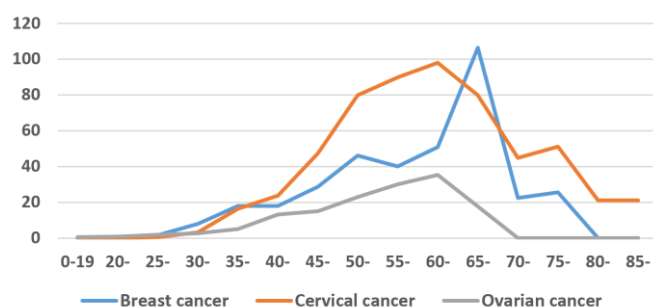
Figure 2a.
Age Distribution Of Patients For The Three Cancer Sites (1960 – 1969)

Figure 2b:
Age distribution of patients for the three cancer sites (2004 – 2013).

The age distribution of cervical cancer patients did not demonstrate a noticeable shift between the two periods, rising to a peak between the ages of 40 and 60 years in both periods. The pattern of age distribution in ovarian cancer patients showed an extension into both extremities of life in the period between 2004 and 2013, unlike in the earlier period when all the patients were aged 70 or less and there were very few patients aged under 30. The most noticeable shift in age distribution is seen in patients with breast cancers where the peak of the curve was seen in patients aged between 55 and 70 years in the period from 1960 to 1969, shifting to between 35 and 55 years in the period from 2004 to 2013.

A more detailed analysis of the data from 2004 to 2013, the time period closest to the present situation, is shown in Tables

1 and 2. Although there were some variations in the numbers of each of the cancers recorded from year to year during the period, there was no clear trend either toward an increase or a decline in the number of cases being recorded. For all the three cancers, women aged between 40 and 59 years constituted the largest group among the age groupings, being a majority in both breast (53.1%) and cervical cancer (51.6%), and a plurality (36.8%) in cases of ovarian cancers (Table 1). Those aged between 20 and 39 years were a major presence (36.5%) among the patients with ovarian cancers, compared to only 12.4% among the cervical cancer patients.

The mean age of the patients at the time of diagnosis of breast and ovarian cancers did not show much variation or any perceivable trend through the ten-year period from 2004 to 2013 as seen in Table 2. It ranged from 48.26 to 50.29 years for breast cancer, and from 51.65 to 58.11 for cervical cancers. The mean age at diagnosis for ovarian cancer patients ranged from 37.5 to 53.95 years during the period, but there was no consistent trend in the pattern from year to year.

DISCUSSION

In the present analysis, we sought to compare the trends and patterns of three common cancer types among Nigerian women. There was an approximately seven-fold increase in the number of cancer cases recorded in this study in the latter ten-year period (2004 – 2013) as compared to that in the first decade (1960-1969) after the establishment of the cancer registry. The age distribution of patients diagnosed with breast cancer changed drastically over the thirty five-year interval between the two periods studied, with age at diagnosis being about twenty years younger in the latter period. The age distribution of patients with ovarian cancer also changed somewhat in the period from 2004-2013, with a greater representation of younger people below the age of 35 years and also a greater representation of those aged above 70 years, compared to the period before 1969.

Table 1: Ages of patients and years of diagnosis of the three common cancers in women (2004 - 2013).

Characteristics		Breast cancer		Cervical cancer		Ovarian cancer	
		Frequency	%	Frequency	%	Frequency	%
Age (years)	0 – 19	6	0.4	0	0	16	6.1
	20 – 39	427	24.6	136	12.4	96	36.5
	40 – 59	924	53.1	568	51.6	97	36.8
	60 – 79	355	20.4	362	32.8	52	19.8
	80 - 99	27	1.6	35	3.2	2	0.8
Year of diagnosis	2004	174	9.9	100	9	19	7.2
	2005	153	8.7	151	13.6	10	3.8
	2006	167	9.5	124	11.1	30	11.4
	2007	167	9.5	136	12.2	17	6.4
	2008	187	10.7	92	8.2	21	8.0
	2009	171	9.8	128	11.5	53	20.1
	2010	198	11.3	101	9.1	36	13.6
	2011	147	8.4	81	7.3	31	11.7
	2012	155	8.9	93	8.3	22	8.3
	2013	231	13.3	108	9.7	25	9.5
	Total	1750	100.0	1114	100.0	264	100.0

Table 2.
Mean ages and standard deviation of different cancer sites (2004 – 2013)

	Breast cancer		Cervical cancer		Ovarian cancer	
	Frequency (%)	Mean Age ± SD	Frequency (%)	Mean Age ± SD	Frequency (%)	Mean Age ± SD
2004	174 (9.9)	49.42 ± 14.34	100 (9.0)	56.20 ± 11.84	19 (7.2)	49.79 ± 12.05
2005	153 (8.7)	49.18 ± 14.31	151 (13.6)	52.31 ± 12.20	10 (3.8)	37.50 ± 15.91
2006	167 (9.5)	47.82 ± 12.35	124 (11.1)	53.14 ± 11.10	30 (11.4)	41.93 ± 17.17
2007	167 (9.5)	48.26 ± 12.59	136 (12.2)	53.58 ± 12.24	17 (6.4)	43.29 ± 11.44
2008	187 (10.7)	49.13 ± 13.05	92 (8.3)	56.23 ± 14.04	21 (8.0)	50.67 ± 16.74
2009	171 (9.8)	48.66 ± 12.85	128 (11.5)	52.83 ± 13.18	53 (20.0)	40.43 ± 18.44
2010	198 (11.3)	50.29 ± 14.07	101 (9.1)	57.81 ± 16.63	36 (13.6)	38.67 ± 15.88
2011	147 (8.4)	48.32 ± 14.41	81 (7.3)	58.11 ± 15.05	31 (11.7)	46.77 ± 17.97
2012	155 (8.9)	49.39 ± 13.47	93 (8.3)	55.32 ± 15.44	22 (8.3)	53.95 ± 18.27
2013	231 (13.2)	48.97 ± 12.16	108 (9.7)	51.65 ± 13.41	25 (9.5)	45.16 ± 15.01
	Mean Age and Standard Deviation 48.96 ± 13.32		Mean Age and Standard Deviation 54.40 ± 13.41		Mean Age and Standard Deviation 44.24 ± 16.99	

The lower numbers recorded between 1960 and 1969 may be attributed to the fact that the cancer registry just opened in 1960 and many patients were not presenting in hospitals and were seeking care elsewhere. The general low level of education, literacy and awareness in the population being served at the time may have affected presentation in hospitals where biopsies were taken and sent to the cancer registry. The increase in the number of cases over the years may be due to more frequent contacts with the health care services especially during the uptake of maternal/child health care, and awareness about breast, cervical and ovarian cancer (Adebamowo and Ajayi, 2006; Ferlay *et al*, 2010; Yakasai *et al*, 2013)

The most common cancer identified in women during the 10-year period from 2004 to 2013 was breast cancer and this is also recognized in global studies (Global Burden of Disease Cancer Collaboration, 2017; Bray *et al*, 2004). This contrasts with the finding of cervical cancer as the commonest cancer of women in the first decade after the establishment of the cancer registry. Breast cancer has remained the most common cancer in Nigeria women for over two decades now Adebamowo and Ajayi, 2006; Ferlay *et al*, 2010; Anyanwu, 2000; Ngadda *et al*, 2008; Kene *et al*, 2010) and the mean age at diagnosis of breast cancer in these women (approximately 49 years) is quite similar to findings in several Nigerian studies while the changing incidence of breast cancer in Nigeria followed a pattern similar to what had been observed in other parts of the third world (Adebamowo and Adekunle, 1999; Anyanwu, 2000; Ngadda *et al*, 2008, Kene *et al*, 2010; Adisa *et al*, 2010). The increasing rate of diagnosis of breast cancer and the younger age at the time of diagnosis that was observed in this study and some others from the developing world has been attributed to such factors as reducing age at onset of menarche, reduced physical activity, improved nutrition and other changes in the diet, increased demands for education and modern lifestyles that delay age at first pregnancy and fertility, and reduced duration of breast feeding Adebamowo and Adekunle, 1999; Adebamowo and Ajayi, 2006; Jemal *et al*, 2011).

Globally, cervical cancer is the 4th most frequently diagnosed cancer in women, but in developing countries, it is the second most commonly diagnosed after breast cancer. The mean age for diagnosis of cervical cancer in the decade from 2004 to 2013 in this study was above 50 years. While similar to findings in some other studies (Rogo *et al*, 1990; Nkyekyer, 2000; Sreedevi *et al*, 2015), it contrasts with findings in parts of Nigeria on the edges of the Sahel and along the coast (Yakasai *et al*, 2013), with a progressive decline in the age at diagnosis in the survey done in Calabar, Nigeria over 5 years. The prevalence of HIV (Human Immunodeficiency Virus) and AIDS (Acquired Immune Deficiency Syndrome) was seen as a contributing aetiology to cervical cancer in younger women in Nigeria's south-east coast (HIV prevalence in the region then was 5.5%). The relatively high mean age found in our study may be attributed to delayed presentation, which was also associated with advanced disease at the time of diagnosis (Yakasai *et al*, 2013; Nkyekyer, 2000; Ebughe *et al*, 2016).

The low relative ratio frequency of ovarian cancer seen in this study is similar to findings in studies done in other parts of Nigeria where few cases were seen compared to other tumours in women (Odukogbe *et al*, 2004; Mohammed *et al*, 2006; Bassey *et al*, 2007). Similar to a study done in the South Eastern part of Nigeria, the mean age at the time of diagnosis of ovarian cancer is below 50 years, as opposed to what has been generally reported about ovarian cancer occurring mainly in the 6th and 7th decades of life (FIGO, 2006; Iyoke *et al*, 2013). In the latter part of the period of study, the age range of patients diagnosed with ovarian cancers expanded, including many more people aged 35 years and under, as well as older women over the age of 70 years. The reasons for this increase in the representation of the younger age group is unclear, but some risk factors such as increase in ovulation induction with the use of assisted reproductive techniques, late onset childbearing and increases representation of women in the formal workforce may be contributory (Odukogbe *et al*, 2004; FIGO, 2006)

One major limitation encountered was that information about disease stage, the length of the period of symptoms before presentation, socioeconomic status and the level of formal education attained by the patients could not be obtained from the cancer registry records. Such information may have

provided a better context for understanding some of the changes observed over the thirty five-year interval between the two periods studied.

In conclusion, breast and cervical cancers remain the two commonest cancers in Nigerian women over the entire 54-year period surveyed, with breast cancer overtaking cervical cancer as the most frequently diagnosed in the latter period. The number of cancer cases recorded increased seven-fold in the final decade compared to the first and the peak age group at diagnosis of breast cancer dropped by about twenty years over the period.

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