CANCER MORBIDITY IN NIGERIAN FEMALES: THE NEED FOR A GRASSROOTS APPROACH TO ITS PREVENTION AND EARLY DETECTION.

TYPE OF ARTICLE: ORIGINAL RESEARCH ARTICLE

ABSTRACT

Background: Cancer is increasingly becoming a major cause of morbidity and mortality, aggravated among women in developing countries because of increasing longevity, population growth and lack of capacity for treatment.

Aim: To highlight the cancer burden among Nigerian females and emphasize the need for a grassroots approach towards prevention and early detection.

Study design: This was a descriptive cross-sectional study.

Methodology: The study was retrospective, analysing data from histopathology reports of cases of cancer in females as diagnosed over 20 years (2000-2019) in the Department of Anatomical Pathology, University of Benin Teaching Hospital, Benin City, Nigeria.

Results: Over 56% of all cancers affected females with 64.9% of cases in the 4^{th}-6^{th} decades. Cancers of the breast, uterine cervix, colon and rectum, uterine corpus, ovary, haematopoietic and lymphoreticular system, and thyroid contributed 36.8%, 20.5%, 4.9%, 3.3%, 2.7%, 2.2% and 2.2% of cancers respectively.

Conclusion: Cancer among Nigerian females is increasing in incidence in the face of the existing weak treatment framework. There is urgent need to invest in cancer prevention and early detection strategies using grassroots-oriented and pre-existing structures to achieve a reversal of this ugly trend.

KEYWORDS: Cancer, Nigerian, Women, Females, Grassroots.

INTRODUCTION

The GLOBOCAN 2020 report estimated that there were 19.3 million new cancer cases and 10 million cancer deaths in 2020. Cancer among females accounted for 47.8 percent of all new cancer cases and 44.5% of all cancer related deaths.[1]

Among developing countries, the cancer burden among women is gaining more significance because of population growth and ageing of the population, as women form a larger proportion of the population of the elderly, where cancers occur most commonly. These women are becoming increasingly exposed to cancer risk factors such as cigarette smoking, obesity, sedentary lifestyle, and modifications in reproductive patterns.[2,3]

Across the cycle of life, the male to female ratio in the population declines from as high as 1.06 male/female at birth to as low as 0.89 male/female beyond the age of 65 years.[4] The role of women as family caretaker and social, political and economic participant is increasing, and improving women's health is vital to achieving their full potential. Therefore, understanding cancer trends and instituting appropriate preventive measures has tremendous all-round potential benefits to the society.

This paper hopes to bring to light the cancer burden among females and to guide policy makers towards prioritizing their intervention policies in favour of preventing cancer in women in Nigeria.

MATERIALS AND METHODS

This study is a descriptive cross-sectional retrospective study of cancer incidence among female patients diagnosed of cancer from 1st January 2000 to 31st December 2019 in the Department of Anatomical Pathology, University of Benin Teaching Hospital, Benin City Nigeria.

All histologically confirmed primary cancer cases among females were included in the study. Relevant data was extracted from file copies of patients' results. The data collected included the age at diagnosis, organ affected and the histopathological diagnosis.

Metastatic diseases were excluded from the study.

Analysis was with SPSS version 16 and the statistical summary is presented in tables and figures.

RESULTS

During this study period, 6,900 cancer cases were recorded in the Benin Cancer registry, out of which cancer among females accounted for 3,879 (56.2%) cases. This is equivalent to a mean annual incidence of 194 cancer cases per year. The yearly trend of total number of cancer cases for both the male and female genders across the two decades of this study is depicted in Figure 1.

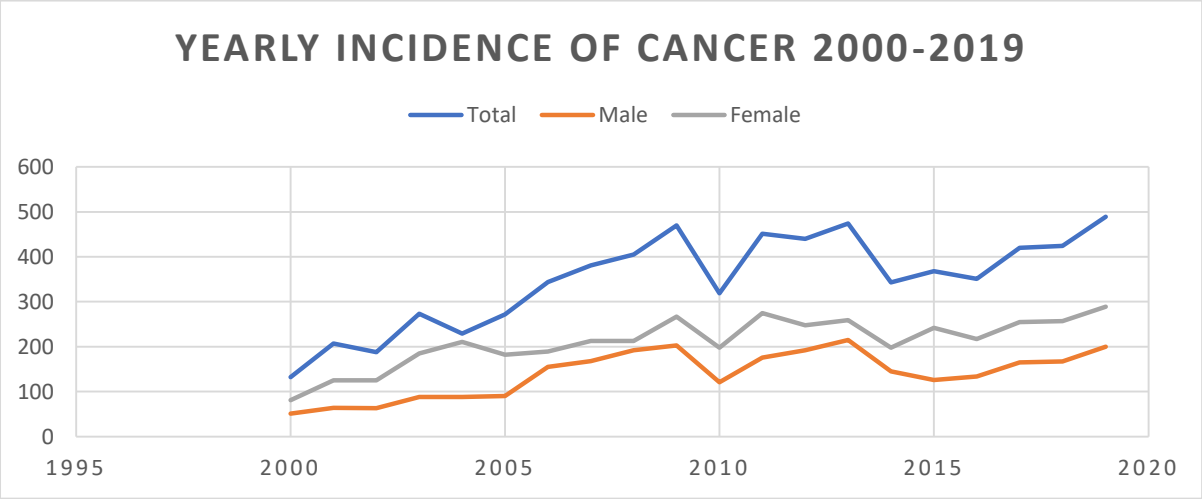

FIGURE I: YEARLY CANCER TREND IN BENIN CITY, NIGERIA

The distribution of cancer by site is shown in table 1 with cancers of the breast, uterine cervix, colon and rectum, uterine corpus, ovary, haematopoietic and lymphoreticular system

and thyroid contributing 36.8%, 20.5%, 4.9%, 3.3%, 2.7%, 2.2% and 2.2% of cancers respectively.

TABLE 1: TOPOGRAPHIC (SITE) DISTRIBUTION OF CANCER

Distribution of Cancer	Frequency	Percent
Anus	14	.4
Bone and joint	19	.5
Brain and Nervous system	49	1.3
Breast	1428	36.8
Colon and rectum	191	4.9
Connective and soft tissue	77	2.0
Uterine cervix	798	20.6
Eye	65	1.7
Uterine corpus	179	4.6
Gall bladder	10	.3
Non melanoma skin	79	2.0
Vulva	42	1.1
Kaposi sarcoma	85	2.2
Kidney	83	2.1
Nose, sinuses	75	1.9
Lymphoma/Leukemia	104	2.7
Ovary	127	3.3
Urinary bladder	49	1.3
Melanoma skin	34	.9
Stomach	66	1.7
Pancreas	6	.2
Nasopharynx	22	.6
Thyroid	87	2.2
Vagina	20	.5
Tonsil	7	.2
Salivary gland	25	.6
Esophagus	18	.5
Lung	24	.6
Small intestine	9	.2
Oropharynx	6	.2
Liver	25	.6
Other thoracic organs	29	.7
Mouth	6	.2
Larynx	21	.5
Total	3879	100.0

Cancer cases in the first to the 10th decades are: 3.2%, 2.4%, 8.3%, 19.2%, 23.9%, 21.8%, 13.8%, 5.7%, 1.6% and 0.4% respectively. Further detail for each organ is depicted in table 2.

TABLE 2A: RELATIONSHIP BETWEEN AGE (YEARS) AND DISTRIBUTION OF CANCER

Cancer	1-10 N(124) (3.2%)	11-20 N(91) (2.3%)	21-30 N(320) (8.3%)	31-40 N(744) (19.2%)	41-50 N(925) (23.9%)	51-60 N(844) (21.8%)	61-70 N(536) (13.8%)	71-80 N(219) (5.6%)	81-90 N(61) (1.6%)	91-100 N(15) (0.4%)	Total N(3879 (100%)
Anus	0(0.0)	0(0.0)	2(0.6)	2(0.3)	1(0.1)	6(0.7)	2(0.4)	1(0.5)	0(0.0)	0(0.0)	14(0.4)
Bone and joint	1(0.8)	9(9.9)	4(1.3)	1(0.1)	2(0.2)	0(0.0)	0(0.0)	2(0.9)	0(0.0)	0(0.0)	19(0.5)
Brain and Nervous system	8(6.5)	3(3.3)	5(1.6)	10(1.3)	5(0.5)	16(1.9)	2(0.4)	0(0.0)	0(0.0)	0(0.0)	49(1.3)
Breast	1(0.8)	9(9.9)	101(31.6)	360(48.4)	410(44.3)	312(37.0)	174(32.5)	44(20.1)	13(21.3)	4(26.7)	1428(36.8)
Colon and rectum	1(0.8)	1(1.1)	11(3.4)	21(2.8)	34(3.7)	67(7.9)	32(6.0)	15(6.8)	9(14.8)	0(0.0)	191(4.9)
Connective and soft tissue	4(3.2)	6(6.6)	12(3.8)	13(1.7)	22(2.4)	9(1.1)	7(1.3)	4(1.8)	0(0.0)	0(0.0)	77(2.0)
Uterine cervix	4(3.2)	5(5.5)	22(6.9)	106(14.2)	205(22.2)	206(24.4)	159(29.7)	72(32.9)	13(21.3)	6(40.0)	798(20.6)
Eye	25(20.2)	0(0.0)	9(2.8)	12(1.6)	10(1.1)	4(0.5)	0(0.0)	2(0.9)	3(4.9)	0(0.0)	65(1.7)
Uterine corpus	2(1.6)	0(0.0)	17(5.3)	22(3.0)	48(5.2)	47(5.6)	31(5.8)	6(2.7)	6(9.8)	0(0.0)	179(4.6)
Gall bladder	0(0.0)	0(0.0)	1(0.3)	1(0.1)	1(0.1)	3(0.4)	3(0.6)	0(0.0)	1(1.6)	0(0.0)	10(0.3)
Non melanoma skin	0(0.0)	2(2.2)	7(2.2)	24(3.2)	15(1.6)	11(1.3)	11(2.1)	6(2.7)	2(3.3)	1(6.7)	79(2.0)
Vulva	1(0.8)	0(0.0)	4(1.3)	3(0.4)	9(1.0)	9(1.1)	9(1.7)	6(2.7)	0(0.0)	1(6.7)	42(1.1)
Kaposi sarcoma	5(4.0)	3(3.3)	25(7.8)	29(3.9)	13(1.4)	5(0.6)	3(0.6)	2(0.9)	0(0.0)	0(0.0)	85(2.2)
Kidney	42(33.9)	4(4.4)	5(1.6)	6(0.8)	14(1.5)	4(0.5)	3(0.6)	3(1.4)	2(3.3)	0(0.0)	83(2.1)
Nose, sinuses	3(2.4)	8(8.8)	15(4.7)	14(1.9)	13(1.4)	7(0.8)	13(2.4)	1(0.5)	1(1.6)	0(0.0)	75(1.9)
Lymphoma/Leukemia	15(12.1)	12(13.2)	10(3.1)	14(1.9)	15(1.6)	15(1.8)	17(3.2)	5(2.3)	1(1.6)	0(0.0)	104(2.7)
Ovary	4(3.2)	5(5.5)	19(5.9)	27(3.6)	28(3.0)	27(3.2)	9(1.7)	7(3.2)	1(1.6)	0(0.0)	127(3.3)
Urinary bladder	1(0.8)	2(2.2)	1(0.3)	9(1.2)	9(1.0)	13(1.5)	5(0.9)	6(2.7)	3(4.9)	0(0.0)	49(1.3)
Melanoma skin	0(0.0)	0(0.0)	2(0.6)	3(0.4)	6(0.6)	8(0.9)	7(1.3)	6(2.7)	1(1.6)	1(6.7)	34(0.9)

TABLE 2B: RELATIONSHIP BETWEEN AGE (YEARS) AND DISTRIBUTION OF CANCER.

Cancer	1-10 N(124) (3.2%)	11-20 N(91) (2.3%)	21-30 N(320) (8.3%)	31-40 N(744) (19.2%)	41-50 N(925) (23.9%)	51-60 N(844) (21.8%)	61-70 N(536) (13.8%)	71-80 N(219) (5.6%)	81-90 N(61) (1.6%)	91-100 N(15) (0.4%)	Total N(3879 (100%)
Stomach	0(0.0)	0(0.0)	3(0.9)	13(1.7)	13(1.4)	12(1.4)	13(2.4)	9(4.1)	1(1.6)	2(13.3)	66(1.7)
Pancreas	0(0.0)	0(0.0)	0(0.0)	1(0.1)	0(0.0)	3(0.4)	1(0.2)	1(0.5)	0(0.0)	0(0.0)	6(0.2)
Nasopharynx	0(0.0)	5(5.5)	4(1.3)	4(0.5)	7(0.8)	2(0.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	22(0.6)
Thyroid	0(0.0)	7(7.7)	24(7.5)	25(3.4)	12(1.3)	10(1.2)	7(1.3)	0(0.0)	2(3.3)	0(0.0)	87(2.2)
Vagina	1(0.8)	0(0.0)	4(1.3)	5(0.7)	1(0.1)	7(0.8)	1(0.2)	0(0.0)	1(1.6)	0(0.0)	20(0.5)
Tonsil	1(0.8)	1(1.1)	1(0.3)	0(0.0)	2(0.2)	1(0.1)	0(0.0)	1(0.5)	0(0.0)	0(0.0)	7(0.2)
Salivary gland	1(0.8)	1(1.1)	3(0.9)	3(0.4)	8(0.9)	5(0.6)	2(0.4)	2(0.9)	0(0.0)	0(0.0)	25(0.6)
Esophagus	1(0.8)	0(0.0)	0(0.0)	1(0.1)	3(0.3)	3(0.4)	5(0.9)	5(2.3)	0(0.0)	0(0.0)	18(0.5)
Lung	0(0.0)	1(1.1)	1(0.3)	4(0.5)	2(0.2)	9(1.1)	5(0.9)	2(0.9)	0(0.0)	0(0.0)	24(0.6)
Small intestine	1(0.8)	0(0.0)	0(0.0)	0(0.0)	3(0.3)	1(0.1)	1(0.2)	3(1.4)	0(0.0)	0(0.0)	9(0.2)
Oropharynx	0(0.0)	0(0.0)	0(0.0)	1(0.1)	0(0.0)	2(0.2)	1(0.2)	1(0.5)	1(1.6)	0(0.0)	6(0.2)
Liver	1(0.8)	3(3.3)	1(0.3)	5(0.7)	1(0.1)	5(0.6)	7(1.3)	2(0.9)	0(0.0)	0(0.0)	25(0.6)
Other thoracic organs	1(0.8)	3(3.3)	3(0.9)	4(0.5)	6(0.6)	6(0.7)	3(0.6)	3(1.4)	0(0.0)	0(0.0)	29(0.7)
Mouth	0(0.0)	1(1.1)	0(0.0)	1(0.1)	2(0.2)	2(0.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(0.2)
Larynx	0(0.0)	0(0.0)	4(1.3)	0(0.0)	5(0.5)	7(0.8)	3(0.6)	2(0.9)	0(0.0)	0(0.0)	21(0.5)

$\chi^2 = 2058.980$; $p<0.001$

DISCUSSION

Our study demonstrated a strikingly consistent female predominance of cancer incidence. It is paradoxical that despite the relatively higher male population,[4] and the generally perceived greater male gender cancer susceptibility[5] cancer has however been reported to be more common among females in earlier studies, representing 55.6-66.4% of all cancers.[6-9] It is also remarkable that for each year, in this study, cancer affected more females than males, reflecting a homogenous trend. This is however at variance with overall global incidence where cancer is generally more common in males.[1]Being a patriarchal society, it might be thought that men would have the greater exposure to cancer-related environmental risk factors. Women are also likely to have less access to health services, because of relatively lower literacy rates, religious and cultural barriers.[10]The greater incidence of cancer among females is therefore a great concern. We are of the opinion that the overall excess of breast and cervical cancer, relative to the global incidence may partly account for this difference.[1] This remarkable difference in trend calls for further studies. We are also worried that this trend may continue to increase if unabated as our women increasingly adopt more westernized lifestyle and diet.[11]

In this study, it was observed that breast, uterus (uterine cervix and endometrium) and colorectal cancer accounted for 67% of cancer in women, with breast and cervical cancer accounting for about 37% and 21% respectively. Other studies have also agreed with this trend.[6-9]It is therefore highly justifiable to suggest that an economically challenged country like Nigeria should develop its planning and resource allocation towards reducing cancer morbidity in women based on this epidemiological pattern.

Sadly, most of these cases are diagnosed in the 4th to 6th decade, with serious socioeconomic impact on national development. It has earlier been established that most of these cases are

diagnosed as advanced diseases and the patients have either limited access to therapy or restricted treatment options, resulting in disproportionately high mortality.[12] Poor education and awareness, poverty, scarcity of health workers, brain drain, infrastructural deficit, poor management and planning, inequality in distribution of health resources and limited access to health care are some of the factors accounting for these.[12,13] Against the backdrop of poor government funding of the health sector, there is need for a more pragmatic approach, if a significant reduction in the incidence of cancer among women is to be achieved.

It will be recalled that Nigeria developed a Cancer Control Programme in 2008, which has failed woefully because of lack of political will to implement it.[14]There is therefore need to give this programme the attention it deserves and possibly address the weak frameworks. We are of the opinion that emphasis should be on cancer prevention and early detection and more importantly, that approach should be integrated into already existing frameworks such as Maternal Health Services and Primary Health Care Services. Schools, market places, religious centres, family planning, antenatal, postnatal and HIV clinics are already existing platforms that could be well utilized to achieve this project at a relatively low cost.

During these clinical visits, and other fora where women gather, focused educational messages on breast, uterine and colorectal cancer prevention and early detection should be continuously delivered to close the knowledge gap and to correct myths and misconceptions. Lifestyle changes that increase cancer risk such as use of oral contraceptives, prolific sexual lifestyle, physical inactivity, alcohol consumption, smoking, and consumption of red and processed meat and obesity, should be discouraged, while those that protect against it such as healthy eating, safer sex and exclusive breast feeding should be encouraged.[9] All young girls and women should be well acquainted with skills on breast self-examination as this will go a long way in ensuring early detection of breast cancer. Mammography should be encouraged among women who can afford it as it remains the gold standard for early detection of breast

cancer.[15,16] Cervical cancer prevention through vaccination for oncogenic strains of human papilloma virus and visual inspection with acetic acid and same-visit cryotherapy are cost-effective methods which can be effectively employed through primary healthcare centres.[17,18] Routine stool occult blood examination and CA 125 monitoring can also be integrated into the primary health care while affluent members of the society can be encouraged to undertake routing colonoscopy against colorectal cancer.[19] Non-governmental organizations and philanthropists should be partnered to improve the outcome of this initiative. Above all, increasing government funding of cancer-related infrastructure and manpower development will definitely drive the desired change.

CONCLUSION

It is clear that cancer in women in our setting is a rising epidemic in the face of the existing weak treatment framework. There is urgent need to invest in cancer prevention and early detection strategies using grassroots-oriented and pre-existing structures to achieve a reversal of this ugly trend.

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COMPETING INTEREST

Authors have declared that no competing interests exist.

LIMITATION OF THE STUDY

Although this research was conducted in by far the largest and most subscribed hospital in this region of the country, this has been a hospital-based study and therefore the volume of the data gathered on cancer among Nigerian females might be an underestimate of the true situation in the wider community.

RECOMMENDATIONS

More attention should be given by the nation's health authorities to prevention and early detection of cancer among females, with a view to achieving a significant reduction in cancer morbidity and mortality. Prevention by control of risk factors can be achieved by massive and aggressive health education and sensitization campaigns at grassroots levels, including vaccination where applicable. To facilitate early detection we recommend an expansion of existing cancer screening programmes for women, and the initiation, sustenance and coordination of additional cancer screening programmes.

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REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin 2021;71:209-249.
2. United Nations Population Division. World Population Prospects, the 2015 revision. [cited 2021 June 14]. Available from: https://esa.un.org/unpd/wpp/.

3. Franceschi S, Wild CP. Meeting the global demands of epidemiologic transition - The indispensable role of cancer prevention. Mol Oncol 2013;**7**:1–13.
4. Nigeria Sex ratio. Available at https://www.indexmundi.com/nigeria/sex_ratio.html. Accessed on 29/06/21.
5. Dorak MT, Karpuzoglu E. Gender Differences in Cancer Susceptibility: An inadequately addressed issue. Front Genet. 2012;3:268
6. Mandong BM, Manasseh AN, Ecejoh GO. Cancer in Nigerian Women: A critical need for prevention Strategy. Nigerian Medical Practitioner.2009;56(1&2):1-5
7. Obiorah CH. Cancer incidence in the Niger Delta Region of Nigeria; A population based review of Port Harcourt Cancer Registry.TNHJ,2020:19(2):85-95.
8. Jedy-Agba E., Curado MP, Ogunbiyi O, Oga E, Fabowale T, Igbinoba F et al. Cancer Incidence in Nigeria: A Report from Population-based Cancer Registries. Cancer Epid. 2012 ; 36: 271–278.
9. Uchendu OJ. Cancer incidence in Nigeria, A tertiary hospital experience. Asian Pac J Cancer Care.2020; 5 (1): 27-32.
10. Varughese J, Richman S. Cancer care inequality for women in resource-poor countries. Rev Obstet Gynecol. 2010 Summer; 3(3): 122–132.
11. Lodge M. The evidence base for cancer control in developing countries: what is to be done? The Newsletter of the International Network for Cancer Treatment and Research. 2005;6(3) http://www.inctr.org/publications/2005_v06_n03_w02.shtml.
12. Morhason-Bello IO, Odedina F, Rebbeck TR, et al. Challenges and opportunities in cancer control in Africa: a perspective from the African Organisation for Research and Training in Cancer. Lancet Oncol 2013; 14: 142–51.
13. Harford JB. Barriers to overcome for effective cancer control in Africa. Lancet Oncol 2015; 16: 385–93.

14. Stefan DC, Elzawawy AM, Khaled HM, et al. Developing cancer control plans in Africa: Examples from five countries. Lancet Oncol 2013; 14: 189–95.
15. Paci E. Mammography and beyond: developing technologies for the early detection of breast cancer. Breast Cancer Res 2002; 4: 123–25.
16. Dey S. Preventing breast cancer in LMICs via screening and/or early detection: The real and the surreal. World J Clin Oncol. 2014 Aug 10; 5(3): 509–519.
17. Wittet S, Aylward J, Cowal S, Drope J, Franca E, Goltz S et al. Advocacy, communication, and partnerships: Mobilizing for effective, widespread cervical cancer prevention. Int J Gnecol Obstet 2017; 138 (Supl 1):57-62.
18. Goldie SJ, Gaffikin L, Goldhaber-Fiebert JD, Levin C, Mahe C, Wright TC. Cost-Effectiveness of Cervical-Cancer Screening in Five Developing Countries. N Engl J Med 2005; 353:2158-2168
19. Levin B, Lieberman DA, McFarland B, Smith RA, Brooks D, Andrews KS, Dash C, Giardiello FM, Glick S, Levin TR, et al. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. CA Cancer J Clin. 2008; 58:130–16.