

A Comparative Study of the Mammographic Prevalence of Breast Cancer in Nigerian Army Personnel and Civilians Attending 44 Nigerian Army Reference Hospital Kaduna-A Five Years Retrospective Study

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ABSTRACT

Background: Breast cancer (BC) is a disease in which abnormal cells in the breast mutate and grow out of control. It is the most common malignancy affecting women in Nigeria. The disease typically affects women of various nationalities and socioeconomic backgrounds, making it a global concern.

Aim: The aim of this study is to determine and compare the prevalence of breast cancer among military personnel and non-military personnel attending the Radiology department of 44 Nigerian Army Reference Hospital Kaduna.

Methods: A retrospective study involving a total of 508 patients who presented for mammography at the radiology department. A *P*-value below 0.05 was considered statistically significant.

Results: Five-hundred and eight mammographic records were used. The mean age in this study was 44.23years. The prevalence of breast cancer among Nigerian army and civilians in this study were 2.4% and 13.8% respectively. .

Conclusion: The prevalence of breast cancer is higher among non-Nigerian Army personnel than their Nigerian army counterparts.

KEYWORDS: Prevalence, Comparative, Mammographic, Breast cancers, Non-Nigerian Army, Nigerian Army personnel

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INTRODUCTION

Breast cancer (BC) is a disease that originates in the epithelial cells of the ducts and lobules of the glandular breast tissues as documented by Yang *et al* [1].The disease typically affects women of various nationalities and socioeconomic backgrounds, making it a global concern.[2] It is estimated that there will be 2.3 million new cases of breast cancer and 685 thousand deaths from the disease by the year 2020.[3] This indicates that breast cancer is currently diagnosed more frequently than lung cancer. By 2070, the number of diagnoses is projected to reach 4.4 million Soerjomataram *et al*[4]. Among women, BC accounted for approximately 24.5% of all cancer cases and 15.5% of all cancer deaths ranking first for incidence and mortality in most of the world countries in 2020 [3]

Age, obesity (high body mass index), smoking, inactivity, a high-fat diet, early menarche, a late first full-term pregnancy, inadequate breastfeeding, use of hormonal menopausal drugs

or oral contraceptives, breast density, and a personal or family history of breast cancer are all risk factors for breast cancer.[5] Other possible causes for the increase in breast cancer incidence include an older population, more exposure to risk factors, and increased detection through mammography screening programs. All of them are potential sources of assistance, and they should be considered.[6] In addition to differences in population size or composition, differences in the prevalence of risk factors and screening procedures also contributed to breast cancer incidence disparities.[7]

Srivastava *et al*[8], reported that an increase in the use of mammography screening since the 1980s is a major influence in nations with high breast cancer rates, such as the United States, the Netherlands, and the United Kingdom. An estimated 2.3 million women were diagnosed with BC, accounting for approximately 24.5% of all cancer cases worldwide. The United States was second only to China,

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which had the greatest incidence of breast cancer at 18.4% of all cases worldwide, with 11.8% of all cases.[9]

The incidence and prevalence of BC seem to be increasing in the developing countries and Africa due to increasing life expectancy, urbanization and adoption of western lifestyles. In a country like Nigeria, the rising incidence of BC is complicated by late presentation which marks BC diagnosis with about 70% of cases presenting at advanced stages of the disease [10]. Mammography, which has been suggested as the most effective diagnostic method, is not widely available and, even when available, is prohibitively expensive.[11] However, early detection of warning signs and symptoms, as well as clinical breast examination (CBE), have been suggested as beneficial.[12] In underdeveloped nations, the good role of breast self-examination (BSE) has also been actively supported as a commendable method.[13]

While data on BC prevalence in Nigeria is lacking, studies in Zaria and other major cities have shown that it is the most common kind of cancer among females in the country. Male BC is an uncommon disease accounting for only 1% of all BCs [14] At Ahmadu Bello University Teaching Hospital (ABUTH) Zaria, 23% of all breast masses diagnosed are malignant in nature.[15]

Although there have been isolated cases of BC awareness and screening organized by members of the Nigerian Army Officers' wives association (NAOWA) in the past[16] there is paucity of information on its prevalence in the Nigerian Army in particular and Nigerian military in general. Knowledge of the Prevalence of BC in patients who visited

44NARHK within the period under review will give a broader picture of its prevalence in the military.

This makes this study imperative and it aims to determine and compare the prevalence of breast cancer among Nigerian Army personnel and non-Nigerian Army personnel at the Radiology department of 44 Nigerian Army Reference Hospital Kaduna.

MATERIALS AND METHODS

The study is a retrospective study using data obtained from mammography register of the department of Radiology of the 44 Nigerian Army reference hospital, Kaduna over a period of 5years (2017-2021).

The 44 Nigerian Army reference hospital Kaduna is a military reference hospital and a UN-level 4 referral hospital. It is located in Kaduna state in Northwest Nigeria and is patronized by Nigerian Army personnel, their families, relatives and several non-Nigerian Army patients.

Ethical approval was obtained for this study.

Babbie et al[17], stated that a response rate of about 50% is sufficient for analysis in descriptive research. Mohammed et al[18], also submitted that responses between 60%-70% are considered adequate, while anything above 70% is considered an excellent response rate. Morris et al[19] asserted that for social studies, responses with a response rate of more than 60% are sufficient for drawing significant conclusions. Data are represented using frequency, percentages and pie charts as appropriate. Statistical significance was considered when *P*-value is <0.05

RESULTS

Table 1: Responses on prevalence of breast cancer among Nigerian Army personnel

S/N	Items	Responses (BIRADS)	Frequency	Percentage
	Prevalence of breast cancer among Nigerian Army personnel	Incomplete (0)	0	0.0
		Negative (1)	14	34.1
		Finding benign (2)	17	41.5
		Probably benign (3)	7	17.1
		Suspicious for malignancy (4)	2	4.9
		Highly suggestive of malignancy (5)	0	0.0
		Biopsy proven malignancy (6)	1	2.4
Total			41	100.0

Data analysis presented in Table1 indicates that the prevalence of breast cancer among Nigerian Army personnel. It shows that there were no inconclusive results (BIRADS 0) =0%. Negative results (BIRADS 1) were 14 (34.1%), benign findings (BIRADS 2) were 17 (41.5%), probably benign findings were 7 (17.1%), suspicious for malignancy were 2

(4.9%).There was no lesion highly suggestive of malignancy (BIRADS 5), but a biopsy proven malignancy was identified (BIRAD 6) (2.4%). In this study, BIRADS 5 and 6 categories were considered to be breast cancer. In conclusion the prevalence of breast cancer among Nigerian Army personnel in this study was 2.4%.

Table 2: Responses on the Prevalence of breast cancer among non-Nigerian Army personnel

S/N	Items	Responses (BIRADS)	Frequency	Percentage
	Prevalence of breast cancer among non-Nigerian Army personnel	Inconclusive (0)	42	9.0
		Negative (1)	152	32.5
		Finding benign (2)	114	24.4
		Probably benign (3)		

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	Suspicious for malignancy (4)	65	13.9
	Highly suspicious (5)	30	6.4
	Biopsy proven malignancy (6)	51	10.9
		13	2.9
Total		467	100.0

From the table above, the total number of non-Nigerian Army personnel in the study is 467. Out of this number, 51 (10.9%) had BIRADS 5 lesions while 13 (2.8%) had BIRADS 6 lesion. Inconclusive reports requiring further investigations were 42 (9.0%), negative findings (BIRADS 1) were 152 (32.5%), benign findings (BIRADS 2) were 114 (24.4%),

probably benign findings (BIRADS 3) were 65 (13.9%) while lesions suspicious for malignancy were 30 (6.4%). In conclusion, the prevalence of breast cancer among non-Nigerian Army personnel in this study is prevalence of BIRADS 5 + prevalence of BIRADS 6 which is $\frac{64}{467} \times 100 = 13.7\%$.

Table 3: Showing the number of Nigerian Army personnel and non-Nigerian Army personnel with BC

Table 3 shows the frequency of patients that were exposed to radiography and the percentage prevalence of cancer among the

	Frequency	Percent	Cancer
CIV	467	91.9	64
MIL	41	8.1	1
Total	508	100.0	65

Nigerian-Army and non-Nigerian Army personnel. The table shows that a total of 508 patients assessed the facility within the 5year period out of which 467(91.9%) were non-Nigerian patients with 64 (13.7%) cancerous lesions while 41(8.1%)

were Nigerian Army personnel, out of which 1(2.4%) had cancerous lesion. The combined prevalence for both Nigerian Army and non-Nigerian Army personnel is 12.79%

Table 4: Annual prevalence of cancer cases at 44NARHK between 2017 and 2021

S/N	Year	Frequency	Cases	Case percent
1	2017	164	24	14.63
2	2018	169	17	10.06
3	2019	117	18	15.38
4	2020	15	0	0.00
5	2021	43	6	13.95
Total		508	65	

From the table above, there were 508 mammography visits within the 5years under review. Out of this number, there were 164 people that presented for mammography in 2017 out of which 24(14.6%) turned out to be cancer. In 2018 there were 169 respondents out of which 17 (10.1%) were malignant lesions. 2019 saw 119 patients turning up for mammography, out of which 18(15.4%) were cases of breast cancer. In 2020, 15 people came for mammography out of which there was no case of breast cancer. In 2021, there were 43 mammography visits out of which 6 (14.0%) were breast cancer cases.

DISCUSSION

Cancer, as defined by Akram et al[20], is a catch-all term for a collection of diseases that can have their genesis in any organ or tissue and spread to other parts of the body when abnormal cells proliferate uncontrollably. Cancer is a general

word for a collection of diseases that can manifest itself in virtually any part of the body. It is a catch-all term for the unchecked and abnormal growth of cells; however, most cancers end in a mass or lump called a tumor. The capacity of cancer cells to proliferate endlessly is one of the characteristics that distinguish them from other types of normal or healthy body cells. There are several different types of tumors, the most common of which is cancer. A benign tumor, often known as a simple tumor, is one that does not contain malignant cells. If the mechanism that causes cancer to develop is allowed to proceed, the person will eventually pass away as reported by Dardi et al.[21]

Rapid proliferation of aberrant cells that invade neighboring tissues defines cancer as a distinct disease. This rapid proliferation of malignant cells is a hallmark of cancer. In a process called metastasis, these cells can spread to other parts of the body and organs. Cancer deaths are typically caused by

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metastases to many organs. World Health Organization (WHO) predicts that cancer will have claimed the lives of around 10 million people all over the globe [22].

Overall, there were 508 mammography exposures within the 5 years under review. 467 were non-Army personnel while the remaining 41 were Nigerian Army personnel. Various category of breast diseases were identified including 65 (12.8%) cases of breast cancer.

Previous studies about breast cancer in the military have mostly dwelled on comparison of risk factors between troops and the general populace and not necessarily the prevalence. Anderson et al [23], documented that troops may be at a higher risk of breast cancer, which is one of the most common types of cancer among troops, with various risk factors associated with duty.

In a different study by Katuwal et al [24] in Nordic countries, it was concluded that, overall, the highest risk elevation were seen among military personnel, followed by dentists and physicians.

In the index study, 41 (8.1%) military women were exposed to mammography tests for various complaints within the period under review. Of this number, only 1 person was diagnosed with cancer giving a percentage period prevalence of 2.4%. This finding does not support previous studies [23,24] that reported higher prevalence in military personnel. The reason for low prevalence of breast cancer in military personnel in this study could be due to Nigerian Army headquarters policy of recruiting fewer women and more men due to the on-going war against insurgency and terrorism. Another reason could be because of the policy of not posting the few female personnel to the epicenter of insurgency, Kaduna which is in the North West of Nigeria being one of such places. A study conducted in University of Maiduguri Teaching Hospital and titled "Burden of breast cancer in North Eastern Nigeria found the prevalence of breast cancer to be 13.9% [25]. In a more recent study conducted at the department of surgery of Ekiti State University Teaching Hospital, Ado Ekiti, titled sociodemographic pattern of presentation and management outcome of breast cancer in a semi-urban tertiary health institution, Olaogun et al found the prevalence of breast cancer to be 12.5% [26]. This finding is close to our finding in this index retrospective study with an overall prevalence of breast cancer of 12.8% among all participants.

Some authors have opined that the prevalence of breast cancer in Nigeria varies across the six geopolitical zones while others have published articles suggesting that it is on the rise. A study carried out at Port Harcourt found a breast cancer prevalence of 26.17% in 2019 and 33.88 in 2020.[27] In our study, the prevalence was 14.63% in 2017, 10.06% in 2018, 15.39% in 2019 and 13.95% in 2021. No cancer was recorded in 2020 ostensibly due to the covid-19 pandemic restrictions, which supports earlier studies.

CONCLUSION

The prevalence of breast cancer among Nigerian Army personnel was significantly less than that of the prevalence of breast cancer among non-Nigerian Army patients mammographically assessed within the period under review.

RECOMMENDATION

More mammography machines should be made available, serviceable, accessible and affordable to improve screening, early detection, treatment and prognosis of breast cancer

LIMITATION OF THE STUDY

Since secondary data were used for the study, some of the patient data were either incomplete or missing. This significantly affected the sample size.

ETHICAL APPROVAL: Was obtained from the ethical committee of my institution

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CONFLICTS OF INTEREST: None.

AUTHORS CONTRIBUTIONS: JND-Conceptualization, data collection, data analysis, manuscript writing; VNA-Conceptualization, manuscript writing, editing and reviewing, SAO-A-Image interpretations, HB-S-Editing and reviewing.

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