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Review article

Mammography screening in Nigeria – A critical comparison to other countries

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ABSTRACT

Breast cancer is a leading cause of death among women, and according to the World Health Organisation (WHO) there will be a significant increase in the incidence of breast cancer in developing countries such as Nigeria by 2030. However, mammography screening can significantly reduce the mortality and morbidity of women as a result of breast cancer. Therefore, the aim of this review is to evaluate the mammography screening program in Nigeria, compare it with four developed countries and then draw inferences.

The Nigerian screening program was evaluated using the following factors: - mode of invitation, frequency of screening, age of the participants, image projections, imaging staff, quality assurance program, and availability. Similarities exist between Nigeria and four developed countries (the United States of America, United Kingdom, Australia and Canada), for instance trained Radiographers do the imaging and the image projections obtained are the same. However, important differences exist, these include mode of invitation, financial model, quality assurance program and availability.

On comparison with the four developed countries, various issues have been identified within the Nigerian breast screening programmes. No one simple solution can be offered to address these as the challenges are multi-factorial.

Introduction

Breast cancer has been reported to be one of the leading causes of mortality among women worldwide; 508,000 women died as a result of breast cancer in 2011.[1] Coleman et al.[2] and Fregene and Newman[3] reported that the incidence of breast cancer amongst women in Western countries (including the United States of America, the United Kingdom, Canada and Australia) was significantly greater than that for women in African countries; the proportion of women that died as a result of the disease was higher amongst women in the African countries. This difference in mortality could be as a result of poor awareness of women about breast cancer, poor diagnostic facilities, poor treatment facilities, and high cost of the disease management.[3] WHO suggests that there will be a 70% increase in the incidence of breast cancer by 2030 in developing countries such as Nigeria.[4] Consequently, appropriate measures should be put in place to improve breast cancer detection and treatment.

Comparing previous records of breast cancer incidence rates among Nigerian women there was a significant increase of 200% since the earliest record from 1960 to 69 which was 13.7 cases per 100,000.[5] The authors made an assumption that this increase could be as a result of increasing change in dietary and physical activity patterns, and alcohol use, as they did not have evidence to prove the causative factors.[5] However, breast screening may be a factor responsible for this apparent increase in Nigeria,[6] with some communities (for example Lagos State Government) reporting the installation of more screening facilities for the early detection of breast cancer.[7]

The stage at which breast cancer is detected determines prognosis.[8] Therefore, early detection is important for reducing the mortality rate of women.[9] Mammography screening is the most effective method for the early detection of breast cancers among asymptomatic women.[1] However, mammography screening has several disadvantages such as radiation risk, false positive results, and over diagnosis. Weighing the benefits and risks of screening, an

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organised mammography breast screening program is said to reduce the mortality rate of women as a result of breast cancer by 20% in the screening group compared to the non-screening group.[1]

Ethically, it is the obligation of a screening program to discuss both the merits and limitations of screening to the women, so that they can make an informed decision regarding participation in the screening program.[10] Furthermore, the benefit to risk ratio of screening should be critically evaluated by clinicians before recommending the screening programs for the patients at higher risk of breast cancer.[11]

The aim of this review is to evaluate the mammography screening program in Nigeria, with critical comparison to four developed countries (United States of America, Canada, United Kingdom, and Australia). This should give an insight as to how the current program is organised and utilised in Nigeria, and also how it might be improved.

Discussion

The screening program in Nigeria is largely unstructured regarding the mode of invitation, frequency of screening, and the age of the participants. For instance, only one Nigerian state out of the thirty-six reported organising a structured mammography screening program.[7] Other non-government organisations and multinational cooperation organisations have also been involved in providing mammographic breast screening in Nigeria but it is haphazard. As there are several important elements involved in the four developed countries' screening programs, the program being evaluated will be discussed using these factors-mode of invitation, frequency of screening, age of the participants, image projections, imaging staff, quality assurance program, and availability (see Table 1).

Mode of invitation

The only available screening program found in Nigeria promotes public awareness campaigns to invite women to participate in its free screening program.[7] However, recent evidence shows that the majority of eligible women within the population have not participated regularly in mammography screening.[7] The use of public awareness may have been responsible for the small number of women participating in the free screening program, as it was reported that only 12,692 women had participated in the mammography screening since 2006, when it began.

The United States of America (USA) and Canada also use public awareness campaigns, and the reason for their success could be because of the strength of their media.[12,13] This is not the case in Nigeria, as the poor in the society have little or no access to information through print media (e.g. newspapers, magazines), watching television, listening to radio, or using the internet.[14] The USA uses a similar approach for inviting women for its mammography screening; however 99.9% of its population has access to information through the media that were mentioned earlier.

According to Azubuike and Okwuokei,[15] and Okobia et al.,[9] a moderate proportion of women (43–56%) in Nigeria have a good knowledge of the early detection strategies of breast cancer (e.g. breast self-examination, clinical breast examination, and mammography). Therefore, more than half of the study participants had practiced at least one of the early detection strategies.[15]

The women with tertiary education and those that had previously been diagnosed with breast cancers had better knowledge of breast cancer, and they tend to practice early detection strategies.[15] Okobia et al.[9] concluded that Nigerian women with a higher level of education were 3.6 times more likely to practice regular breast self-examination.

The results show that there is an increased knowledge of women about breast cancer risk factors, and breast cancer signs and symptoms compared to previous literature on a similar topic,[15,9,16] with about 50% of the study participants identifying up to three risk factors, and about 65% of the participants identifying up to two signs and symptoms of breast cancer. Azubuike and Okwuokei[15] suggest that the reason for this increase is as a result of increase in public awareness programs organised for women in the communities.

There was a direct relationship between knowledge levels and the practice of early breast cancer detection strategies. Also, there was a direct relationship between knowledge of breast cancer risk factors and practice of early breast cancer detection strategies.[15] Therefore, it is important that Nigerian women are educated about the key aspects of breast cancer and how to detect or prevent it.

In summation, there is an imbalance in the knowledge and practice of regular breast screening between groups of women with different education levels in Nigeria. However, for a screening program to be effective in Nigeria, education must be considered a priority to increase public awareness and screening rate. This has to be taken in to consideration as this might improve screening rate uptake, so that the desired benefit of screening can be achieved.

The approach used by the United Kingdom and Australia (a letter of invitation to attend) could be adopted by the Lagos State Ministry of Health (LSMH) screening program, as this has the ability to reach more of the women of interest in the population.[17,18]

Bonfill et al.[19] conducted a systematic review to evaluate different mammography invitation strategies and their effectiveness. They concluded that, interventions such as, invitation letter, making phone calls, mailing educational materials, and organising training activities with reminders for the women were effective at increasing the attendance rate of women invited to mammography screening programs. Furthermore, the combination of effective interventions such as, a letter invitation and phone calls have greater effect on the attendance rate among women within the lower socioeconomic group. It is possible that interventions such as these might increase the attendance rate for the LSMH screening program.

Frequency of screening

In many of the screening programs around the world, women are encouraged to participate in breast screening once every two

Table 1
Table showing the comparison of the mammography screening programs in Australia, Canada, Nigeria, UK, and USA.

Category	Australia	Canada	Nigeria	United Kingdom	United States of America
Mode of invitation	Invitation letter	Public awareness	Public awareness	Invitation letter	Public awareness
Age of participants	50–74 years	50–69 years	40–70 years	50–70 years	40–70 years
Frequency	Biennial	Biennial	Biennial	Triennial	Annual
Image projection	2 views	2 views	2 views	2 views	2 views
Imaging staff	Trained Radiographer	Trained Radiographer	Trained Radiographer	Trained Radiographer	Trained Radiographer
Quality assurance	Frequently reported	Frequently reported	None	Frequently reported	Frequently reported
Availability	63 units per million	40 units per million	Data not available	21 units per million	89 units per million
Cost	Free	Free	Mixed	Free (cost covered by the NHS)	Self-funded