Research Article **Open Access**

Screening & Awareness of Breast Cancer in an Urban Slum of Pakistan: A Pilot Study

Iqbal M[1], Khan MA[*2], Rabbani U[3], and Zafar S[3]

[1]Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan
[2]Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan
[3]Al-Bukayriyah University, Ministry of Health, Kingdom of Saudi Arabia

[*]**Corresponding author:** Khan MA, Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan, Tel: +923345245850, E-mail: muhammadkhan87@gmail.com

Abstract

Background: Breast cancer is the most common cancer in women across the world with low survival rates in less developed countries. Low survival rates in less developed countries can be explained mainly by the lack of early detection programs and lack of adequate diagnosis and treatment facilities. Pakistan has high incidence of breast cancer. About one third of all cancer deaths in Pakistan are due to breast cancer. Given that Pakistan is a low resource setting, we aimed to assess the feasibility of breast self-examination followed by clinical examination as a population-based screening tool for breast cancer.

Methods: The study was piloted in Rehri-Goth, an urban slum of Karachi. Volunteer university students were trained on breast self-examination. The volunteers went door to door creating awareness in the community regarding the danger signs of breast cancer and the importance of self-examination. All participants aged > 40 years who identified any danger sign were called to the outreach center of Aga Khan University for clinical breast examination followed by diagnostic mammography.

Results: A total of 526 houses were reached and 93 women were educated and screened. Nine women were examined by a surgeon in the outreach centre. Two women were referred for diagnostic mammography. One of them had Paget's disease. The other woman was diagnosed with stage II breast cancer.

Conclusion: Although mammography has been established as the gold standard for screening breast cancer in the community, however in low resource settings like Pakistan, breast self-examination followed by clinical breast examination can serve as a useful tool.

Keywords: Breast Cancer; Mass Screening; Self-Examination; Pakistan; Health Education

List of abbreviations: LMIC: Low-Middle Income Country; BSE: Breast Self-Examination; CBE: Clinical Breast Examination; WHO: World Health Organization; PHC: Primary Health Care; AKU: Aga Khan University

Introduction

Breast cancer is the most common cancer in women both in the developed and less developed world. It is estimated that worldwide over 508,000 women died in 2011 due to breast cancer [1]. Breast cancer survival rates vary greatly worldwide, ranging from 80% or over in North America, Sweden and Japan to around 60% in middle-income countries and below 40% in low-income countries [2]. The low survival rates in less developed countries can be explained mainly by the lack of early detection programs, resulting in a high proportion of women presenting with late-stage disease, as well as by the lack of adequate diagnosis and treatment facilities.

Breast cancer is the most common cause of cancer in Pakistan, attributing 40.2% of all the national cancer cases [3]. The incidence of breast cancer is the highest among all the cancers in the females of Pakistan reaching up to almost 34038/100,000 compared to 5693/100,000 and 3703/100,000 for the cancers of the oral cavity and ovary respectively [4]. The list of risk factors for high prevalence of breast cancer in the women of Pakistan is not exhaustive; however it is evidenced that poor diet, lack of physical activity, less than 37% exclusive breastfeeding, age greater than 55 years and obesity play a role [5]. Pakistan has the highest incidence of breast cancer in Asia, leading to death of about 40,000 women every year [6]. Its incidence is 2.5 times higher than the neighboring countries like India and Iran [7]. The cancer related mortality too is the highest due to

breast cancer; almost 30.8% of all cancer deaths [4]. The primary reason for the high mortality associated with breast cancer in Pakistan is that it is highly under-diagnosed. Lack of awareness, especially in the rural areas, leads to diagnosis at a very late stage when cure from the disease is not an option. Nearly half of the women diagnosed with breast cancer every year die owing to the late diagnosis of the disease [8]. Efforts are required for the early detection of breast cancer in order to decrease the morbidity and mortality associated with it.

Due to lack of adequate resources in Pakistan and other low middle-income countries, mammographic screening may not be the ideal method of early identification at the population level. Clinical Breast Examination (CBE) offers promise in downsizing of the tumor at diagnosis due to early detection of symptoms. Breast Self-Examination (BSE) has not been studied for effect on down-staging at diagnosis, but it improves early detection and reporting of symptoms of breast cancer. The latter two strategies do not pose stress on resources and are the cornerstone of early diagnosis in LMICs [9].

According to the recommendations by W.H.O, in countries with limited resources and weak health systems, population based clinical breast examination remains the mode of choice for screening of breast cancer. Given the high burden of breast cancer and under-diagnosis in Pakistan, there is need to have a screening program of breast cancer in the communities. Our aim was to educate the masses regarding the early detection of breast cancer. We also intended to assess the feasibility of breast self-examination followed by clinical examination as a population-based screening tool. This project was planned as a model to be implemented in the larger community if found feasible.

Materials and Methods

Study Setting

We piloted this project in the community of Rehri Goth, a peri-urban slum area in the neighborhood of Bin Qasim, Karachi. The population of Rehri Goth is estimated to be 75,000 and there are approximately 12,000 houses in the community [10]. The town of Rehri Goth is divided into eighteen smaller clusters called 'Para'. We included all 'Paras' for the purpose of screening of breast cancer. The Aga Khan University (AKU) has a primary health care (PHC) center established at Rehri Goth, which was utilized for clinical breast examination of women.

Programme Design

We used the modality of sequential screening; breast self-examination (BSE) followed by clinical breast examination. In the first step BSE was carried out and those who reported a lump or other danger signs including a change in size, appearance and skin of the breast, wrinkles or dimples in the skin of the breast, a lump in the breast, discharge from the nipple, pimples on the nipple, areola or the breast, nipple inversion or pain were then examined by a surgeon at PHC. Participants in whom the clinical breast examination was suggestive of breast cancer were taken for diagnostic mammography. The confirmed cases of breast cancer were referred to a nearby tertiary care hospital for treatment.

Implementation of the Programme

Prior to starting the screening program, efforts were put in by the lady health visitors of AKU and the local social activists to create awareness among the masses regarding the study. This helped to gain access to the participants. Five female university volunteer students were trained for field work. A five-day workshop was conducted by the principal investigator to train volunteers for educating the masses regarding breast cancer and the technique of breast self-examination.

The training of the trainers was followed by the implementation of the education and screening programme in the community. The field work was carried out from 19th December, 2016 to 2nd January, 2017. About thirty houses were included from each *Para*. Health education regarding breast cancer was given in all the households. A household was included for screening if there was at least one woman aged 40 years and above. If there was more than one eligible woman in the household, all of them were included. Written consent was taken prior to administering the questionnaire. The questionnaire included questions related to the age of menarche, age of menopause (if applicable), and the women's parity. Participants were also asked about the history of any breast lump, pain or tenderness. The participants were then educated regarding the signs and symptoms and early detection of breast cancer, the technique of breast self-examination was demonstrated. The participants were also given brochures illustrating the danger signs of breast cancer and pictorial representation of breast self-examination.

Post-Screening Follow-up

At the last day visit to the community, the women were channelized to come to the AKU primary health care center on a specified date for clinical breast examination in case any danger sign for breast cancer was elicited. The clinical breast examination was performed by a lady surgeon at the AKU, PHC center.

Results

A total of 526 houses of the 18 *Paras* were reached by the project team and breast cancer education was given. The houses

were reached out on the basis of feasibility and 131 women aged >40 years were invited to participate. A total of 93 women participated in the study.

The mean age of women of the study was 53.6±13.2 years. All of them were married. The mean age of menarche was 13.4±1.4 years Majority of the women were multiparous with a mean of 5.7±2.7 children per woman. Only six participants were uniparous. About 77.41% of the women were pre-menopausal with the average age of menopause being 46.9±5.6years (Figure 1).
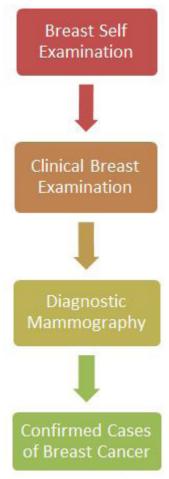

Figure 1: Sequential Screening of Breast Cancer

After the BSE of the 93 participants, 18 reported danger signs of breast cancer. Majority of the women, 17 reported a unilateral lump in the breast whereas one complained of nipple discharge (Table 1). Transport arrangements were made and the participants were brought to the AKU primary health care center. Only 9 out of 18 women turned up on the specified date and were examined by a lady surgeon. Informal interviews with the participants revealed that the rest of the women did not appear for clinical examination as "*they were not allowed by the husbands to leave home*", "*had to prepare meal for lunch*", "*were afraid of finding out anything serious about their health*". The clinical examination of the nine participants revealed that two required a diagnostic mammography.

Characteristics	Mean±S.D
Age of participant (years)	**53.65±13.26**
Age at menarche (years)	**13.43±1.46**
Age at menopause (years)	46.91±5.68
Number of children	5.78±2.70

Table 1: Characteristics of the Participants (n=93)

Our team members accompanied the two participants to 'Dar-ul-sehat', a tertiary care hospital for standard full field digital mammography. The mammograms were read by a consultant radiologist at Aga Khan University Hospital. One of the participants was diagnosed to have Paget's disease of the breast whereas the other participant was labeled as invasive ductal carcinoma of the breast stage II. The detected Breast Cancer patient in our study was aged 45 years, pre-menopausal, had 5

children and her last pregnancy was 8-10 years back. Thus, one case of breast cancer was diagnosed after screening 93 women, giving a cancer detection rate of 1.04%. The diagnosed case was taken to a public sector tertiary care hospital providing free treatment, for further management.

Discussion

We aimed to explore the usefulness of breast self-examination as a population-based screening tool in the context of Pakistan. Our study has revealed a detection rate of 1.04% for breast cancer by physical examination. Although clinical breast examination and screening mammography remain the mainstay for population based breast cancer screening, yet, in a limited resource setting like Pakistan, breast self- examination can be of worth in preventing and delaying morbidity and mortality associated with delayed identification of breast cancer [11]. A similar finding has been stated by the National Canadian Breast Screening Study which shows that there is no additional benefit in breast cancer mortality reduction by the use of screening mammography in addition to physical examination or usual care; rather there is 22% over-diagnosis of breast cancer with screening mammography [12]. However, some studies show additional benefit of screening mammography over clinical examination demonstrating the sensitivity, specificity and accuracy of mammography as 77.6%, 98.8% and 98.6% respectively; those of examination as 27.6%, 99.4% and 98.8% respectively [13]. In our study only, half of the high-risk women turned up for the clinical examination. There is a possibility that the detection rate could have been even higher had they been a part of the study till the end. Currently there is no population-based screening program for early detection of breast cancer in Pakistan. Based on our findings we conclude that physical examination can be used as a tool for screening of breast cancer in a low resource setting like Pakistan. Several studies in Pakistan have recommended Self-Breast Examination as a cost-effective and feasible strategy to substitute for more costly mammograms, in resource-limited settings and in areas where access to medical professionals may be inadequate or difficult [14,15].

In Pakistan, the efforts towards breast cancer screening and early detection at a population level are fragmented at best. Dedicated breast cancer care centers have been set up in Islamabad (2014) and Lahore (2017), which provides free of cost mass screening services to the local communities. Other public and private organizations have also provided sporadic screening services in local communities through mobile clinics or health camps. However, there is no surveillance mechanism developed as part of these initiatives, and no data is available with regards to screening results. We recommend that all efforts in this regard be unified, so that a scientific database can be created [16]. Efforts are being made towards development of nationwide hospital-based registries for cancer patients, primarily led by the Pakistan Atomic Energy Commission, but at the moment, paucity of data makes it difficult for generation of evidence-based decision making.

Some methodological and technical limitations need to be considered while interpreting the outcomes of this study. The volunteers educating the participants were university students. We learned from our experience that volunteers having some medical background such as medical or nursing students would be a better option for educating the masses. In this pilot project recruitment of participants was non-random and included women from a single community; therefore, the generalizability to the bigger population is not possible, however that was not the purpose of the study. Our study has revealed the importance of breast self-examination as a useful tool for population-based screening. Based on our findings, we have concluded that sequential screening is a feasible option for the detection of breast cancer in our community and that this study design can be applied to a larger cohort. The recommendation for prevention of breast cancer through screening in current practice in Pakistan is a grey area. Different clinicians have tailored guidelines according to local context, but there exists a gap for national level comprehensive policy. Based on our findings, we advocate that awareness needs to be created among the masses regarding breast cancer and the importance of breast self-examination. Unfortunately, we do not have a national breast cancer screening program. There is a dire need to combine efforts in a concerted and unified manner. Development of a national breast cancer screening policy followed by community-based programs will help us identify missed cases, and improve service delivery component to those in need.

Conclusion

We conclude that sequential screening is applicable to detect breast cancer in our setting. Large scale projects need to be implemented involving multiple communities for breast cancer detection using BSE and clinical examination to prevent or delay morbidity and mortality associated with breast cancer.

Acknowledgements

Declarations

Consent for Publication

Written informed consent for publication was obtained from all the mothers of the participants.

Availability of Data and Material

The datasets analyzed for this paper are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

Funding

Authors' contributions

MI came up with the conception and design of the study. She was involved in the rolling out of the project. She was a major contributor in writing the manuscript. MAK participated in writing the manuscript and critically revised the content. UR provided a supervisory role during the rolling out of the study. He also reviewed and revised the manuscript. SZ was the surgeon involved in carrying out the clinical breast examination in the outreach clinic.

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