COMMENTARY

Management of Breast Lesions by Breast Physicians in a Heavily Populated South Asian Developing Country

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Abstract

Background: In Asia, from 1998 to 2002, the highest annual-age standardized incidence rates of breast cancer per 100,000 women were recorded as follows: in the Karachi South district of Pakistan 69.0 and in the Israeli Jews 96.8. At Shaukat Khanum Memorial Cancer Hospital and Research Center in Lahore, Pakistan, in 15-years from Dec. 1995-Dec. 2009, among adult females, approximately 46% (8,915) of malignancies were recorded as breast tumors. Further, according to Pakistan's population estimates (2009), the total population of the country is 177 million; females 85 million (40-69 years: 13.6 million). Discussion: Screening of asymptomatic women: Basing the recommendations on biennial mammograhic screening for average-risk women in the 40-69 year age-band, about 6.8 million women will have to be screened every year. In a resource-constrained country like Pakistan, early detection by this method is not possible. As most symptomatic women present with advanced disease, clinicians skilled in breast diseases are required. The Australasian Society of Breast Physicians has developed a formal three year training model for General Practitioners to qualify as breast physicians by: i) developing their skills in the areas of clinical breast-examination, interpretation of mammography and breast ultrasound; performance of image-guided interventional procedures; counseling of and planning/coordinating treatment of females with breast cancer and assessment/monitoring of women at potentially 'high-risk' of cancer; and ii) working in consultation with surgeons, radiologists, pathologists, oncologists, and other members of the multidisciplinary team. Summary: Easily accessible one-stop breast clinics staffed by trained breast physicians can help reduce morbidity/mortality from breast cancer in developing countries, and improve the quality of life and survival.

Keywords: Breast cancer - mammograhic screening - symptomatic women - breast physicians.

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Background

In the more developed regions of the world such as Australia and America, the age-standardized incidence rate (ASR) of breast cancer is very high. This is supported by the most recent figures as follows: per 100,000 women, in 2006 in Australia (NBOCC-AIHW, 2009), the ASR stood at 112 and in the United States in the Surveillance, Epidemiology and End Results (SEER) Program, in 2006, for all races combined, it was 123.6 (Alketruse et al., 2010). Latest reports from Asia show that the annual ASR per 100,000 women for the time period between 1998 and 2002 stood at: 96.8 for Israeli Jews; 69.0 in the Karachi South district of Pakistan; and 26.9 in Mumbai, India (CI5, 2010). Based on these rates, one can conclude that the incidence of breast cancer among women in Karachi South follows the high incidence of breast cancer among Israeli Jewish women, and is the second highest in Asia. In contrast to the results for Karachi South, in India, the ASR for breast cancer has been recorded to be relatively low, i.e., the average is approximately 26 per 100,000 females, per annum, in Madras and Mumbai during 1998 and 2002 (CI5, 2010). Therefore, the difference in the ASRs between these two adjoining countries with similar socio-cultural background is perplexing. Although the moderately high ASR in the Karachi South district of Pakistan is alarming, the results from one part of the country cannot necessarily be extrapolated to the population of the country. This is due to the fact that the total population of Karachi South during the period under study was 1,691,452 (females 780,088 (46%)) (Bhurgri, 2001), accounting for nearly 1% of the total population of the country. The absence of a national cancer registry or regional registries makes it difficult to report the incidence of breast cancer in the country or other regions of Pakistan. Efforts are being made by some professionals to establish one in Lahore. It is hoped that their efforts will bear fruit in the near future and there will be a functioning registry in Lahore district, as per international standards.

Shaukat Khanum Memorial Cancer Hospital & Research Center (SKMCH and RC, 2009) is a complete cancer treatment facility established in December 1994 in Lahore, Pakistan. Of the 42,163 malignancies registered over a 15-year period from Dec. 1994-Dec. 2009, among

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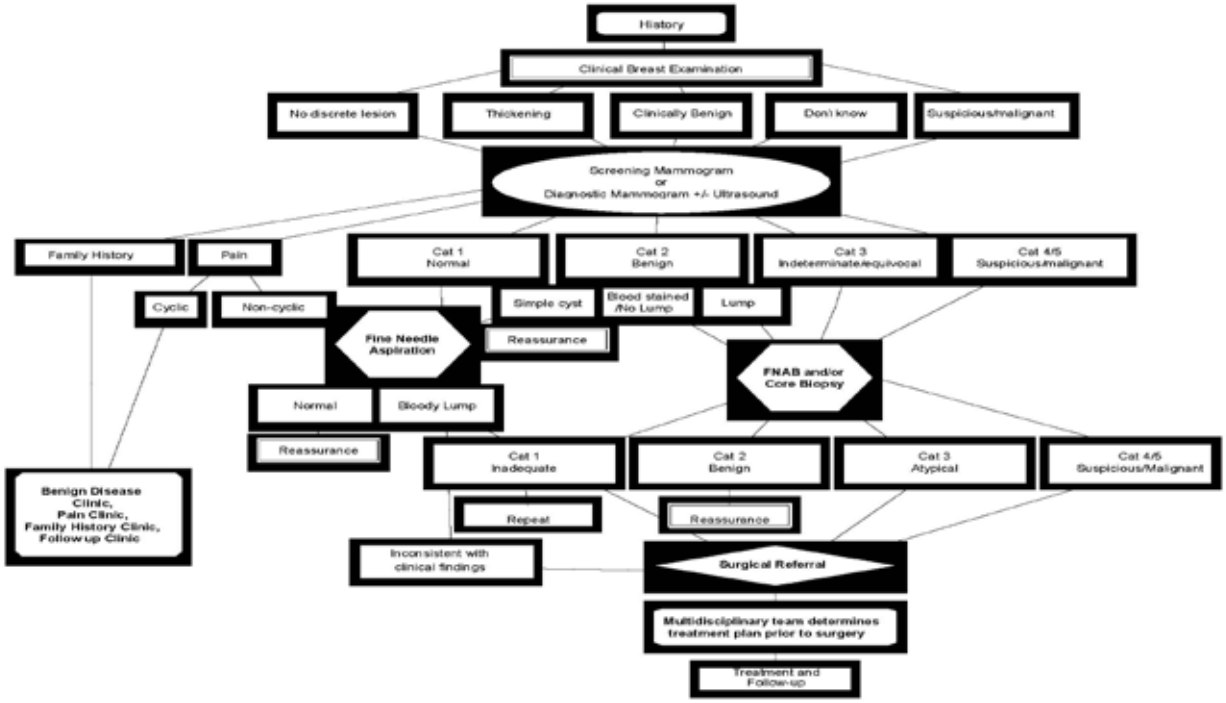

Figure 1. Decision Tree Regarding Management of Women Presenting with a New Breast Symptom

females, nearly 46%, that is, 8,915 were recorded as being breast malignancies (SKMCH and RC, 2009). Further review of the data showed that, of these 8,915 cases, approximately 40% were seen in residents of the district of Lahore, with the balance coming from around the nation. Other than this, 628 cases of benign breast lesions have also been recorded. Benign diseases have included fibroadenoma, intraductal papilloma, Phyllodes tumor benign, neurofibroma, tubular adenoma, and granular cell tumor.

In recent times the Hospital has also been working towards increasing the level of awareness about early detection of cancer in the society.

However, in Pakistan, it is still perceived that women have a low level of awareness about breast health/ cancer and Breast Self-Examination (BSE); therefore, they only approach the health professionals once the cancer has reached an advanced stage in the natural history of the disease. The extent to which health professionals especially the General Practitioners (GPs) and gynecologists are familiar with breast health/cancer, Clinical Breast-Examination (CBE), or screening for latent disease has yet to be studied in depth. The GPs and gynecologists are of paramount importance in the Pakistani community because the vast majority of the population tends to go to them initially as their primary care physicians for any health-related problems. Accordingly, the role of GPs working on breast diseases seems to be the only way forward in a heavily populated South-Asian developing country.

Discussion

Magnitude of the problem; implication of initiating a formal screening program at a national and city level:

Nationwide screening

The 2009 estimates show that Pakistan has a population of 177 million. This figure is based on the last census held in the country in 1998 and an average annual growth rate of about 2.69% in the country (Census, 1998). Females comprise nearly ½ (85 million) of the total population (Census, 1998). Of the female population, the proportion of women in the 40-69 year age-group is about 16%, that is, about 13.6 million (Census, 1998). Bearing this in mind, nearly 6.8 million women will have to be screened every year following the recommendations of the U.S. Preventive Services Task Force (USPSTF) on biennial mammographic screening for women at average-risk, starting at age 40 years (Nelson et al., 2009). However, with an additional 23 million females currently aged 20-39 years, this total would increase to approximately 38 million within the next 20 years. Therefore, each year, the numbers needed to be screened would be as follows: beginning year 2009/2010, 6.8 million and in the year 2028, 19 million. Further, the USPSTF has also extended the screening interval from 1 to 2 years, biennial screening, based on statistical modeling (Nelson et al., 2009; Smith et al., 2010). In the final evaluation, it was estimated that screening women aged 50 to 74 years biennially achieved noteworthy benefit (70% to 99%) and a reduction in the harm by 50% (Smith et al., 2010).

City-wide screening

The total population of Lahore district is estimated to be nearly 9 million with females being about 4.5 million in numbers. These population estimates are based on an average growth rate of 3.46% per annum for Lahore district as published by the Census Bureau in 1998 (Census, 1998). Females in the 40-69 years make up a figure of 714,641 (16% of the female population).

Basic infrastructure and healthcare providers needed

According to the Forrest Report, in the first round, the biopsy rate in those screened for breast cancer is expected to be around 1.5% and the incidence of carcinoma about 0.55% (Chapman and Nakielny, 1990). This makes an incidence of about 6 cancers per 1000 women. Further, as has been evaluated in Australia, which runs a successful formal program for breast cancer screening using both mobile and on-site mammography (BreastScreen Australia Evaluation Report, 2009), one mammography machine with two radiographers, performing 2 views (Cranio-Caudal and Medio-lateral Oblique) can screen over 7000 women in a year, and that is allowing for standard working hours (8-hours a day) and normal public holidays (Source: Elizabeth Trevan, Ex-Director, BreastScreen NSW, North Coast). Per 7000 sets of films, the number of health-care professionals needed would be as follows: two to three radiologists to read the mammography films, one pathologist, and one or two surgeons (Source: Elizabeth Trevan). This summary is meant to give an overview of some aspects related to screening. Therefore, from these figures, it is possible to derive the number of machines and manpower needed for 357,320 females (50%), to be screened annually in Lahore. In order for a formal screening program to be successful, in total 70% of those at risk of the disease need to be screened biennially. The numbers would still be unattainable.

Further, it has been observed that radiological performance in developing countries of the world is often hampered by the standard of education for radiologists and radiographers, the poor condition of equipment including lack of maintenance, dearth of trained personnel, extremes of climate, lack of clean water, and interruptions in electricity supplies. Additionally, in developed countries, for every 10,000-30,000 population, the ratio of radiologist(s) to the population is 1:10,000-30,000 (Nordenstam C-GS, 2010). Moreover, it is estimated that in Lahore, there are approximately 150 radiologists (Source: Zia Faruqui). Accordingly, for a population of 9 million, there would be just one radiologist for 60,000 persons. Also, the qualifications and experience of the radiologists in reading screening mammograms is unknown. Supposing around 357,320 women undergo screening every year, each radiologist will have to read about 2,400 sets of films annually, but for a quality program with independent double reading, the number of sets of films to be read would be around 4,800, in addition to their current radiology work load.

Life expectancy

The life expectancy at birth of Pakistani females is 68 years (Statistics Division- Govt. of Pakistan, 2009). In the developed countries of the world, the life expectancy of women is as follows: Australia: 84 years (AIHW, 2010). and America 80.2 years (Arias, 2010). The life expectancy of the Pakistani females is considerably lower than that of the women in Oceania and the West.

Age at presentation of breast cancer

In Pakistan, various studies in the region have reported the average age at presentation to be approximately 48 years, in the range of 21-87 years (Bhurgri et al., 2007; Nisa et al., 2008; Ahmad et al., 2009; Sharif et al., 2009). This average age recorded in our country is different from what has been reported in a study conducted on 1,134 American subjects; the age at diagnosis was 62.7 years (Onitilo et al., 2009). Further, for two race/ethnic groups in the United States, the presenting age was documented to be as follows: 54.2 years for African-American patients (N=1,632) and 60.4 years for Caucasians (N=671) (El-Tamer and Wait, 1999). In addition, in Australia, the mean age at diagnosis has been confirmed to be 60 years (NBOCC-AIHW, 2009).

Results from SKMCH & RC

Recent unpublished data from SKMCH & RC's Hospital Cancer Registry have shown that during a 7-year time period extending from Jan. 2003-Dec. 2009, of the 23,097 malignancies recorded at the Hospital, nearly 21.7%, i.e. 5,018, were breast malignancies in females. The average age at presentation of these females was 47.6 years (SD 12.2, range 18-102, median 46, and mode 45 years). Nearly 64% females were in the 40-69 year age-group, with approximately 32% being under age 40 years. About 86% of the cancers were invasive ductal carcinomas. The stage distribution (AJCC, 2002). was as follows: stage II-43%, stage 3-23%, stage IV-8%, stage I-7%, and stage 0-2%. Nearly 15% of the cancers could not be staged. The grade distribution was as follows: well differentiated 2.3%, moderately differentiated 32%, and poorly differentiated 45%. The grade could not be determined in 21%.

Early detection of breast cancer

Taking into account the fact that, at SKMCH & RC, over 30% of the cases were diagnosed in stages III and IV, it is worthwhile considering early detection of the disease so as to downstage the cancers. The figure of 30% in stages III and IV is in contrast to the figure of 5% of cancers with distant metastasis seen in America for women presenting with breast cancer (Altekruse et al., 2010), and a figure of 4% reported in New South Wales in Australia, from 1995 to 2004, for both males and females diagnosed with breast cancer (NBOCC-AIHW, 2009). A report for the Karachi Cancer Registry for the time period 1995-1999 shows 11% of the breast malignancies to have presented with distant metastasis (Bhurgri, 2001).

Early detection of breast cancer is possible through two methods:

a) awareness or early diagnosis of early signs and symptoms in symptomatic- and those at potentially high-risk- populations, in order to facilitate disease management including diagnosis and treatment (WHO, 2009), and

b) identification of individuals with an abnormality suggestive of cancer using a screening test in an organized method, in a seemingly asymptomatic population (WHO, 2009).

Running a screening program is far more complex than an early diagnosis program. Bearing the aforementioned

factors in mind, adopting mammographic screening in a heavily populated low- or middle- income country seems highly unlikely. Therefore, in order to improve breast cancer outcomes and survival, early detection in symptomatic females and those potentially at high-risk makes the basis of breast cancer control. This can assist in downsizing of the disease and a reduction in the breast cancer associated mortality (Anderson et al., 2008).

How to assist with early detection of breast cancer?

For an early detection of breast cancer, the measures that are recommended include incrementally increasing resource allocation beginning with the basic-level and leading to the limited-level of resource (Anderson et al., 2008). Accordingly, the basic level (Anderson et al., 2008). early detection resource allocation could be made possible through the following measures:

a) developing appropriate cultural and linguistic material for local public breast health awareness campaigns that include information and education in breast self- examination, risk factors, and the benefits of early detection;

b) developing professional educational campaigns promoting clinical history and clinical breast-examination as the primary detection methods; and

·evaluating the combined public and professional breast health awareness program through the improvement in breast cancer outcomes due to early detection.

After increasing the level of awareness, moving to the next level using limited resources (Anderson et al., 2008). the following steps could be adopted:

a) Specifically designed CBE education and outreach programs for health-care workers in the field at a district or provincial level that target age-groups at higher-risk;

b) referral of women with a positive CBE for diagnostic breast ultrasound ± diagnostic mammography ± Fine Needle Aspiration Biopsy (FNAB);

c) Following evaluation of financial and human resource constraints, breast cancer risk factors, and associated demographics, considering targeted screening mammography; and

d) Setting symptomatic disease downsizing as the evaluation tool.

What seems feasible in Pakistan?

In a resource-constrained country like Pakistan, with neither the clinical nor the technical support needed to initiate mass screening in the target population, as described above, early detection of breast cancer in asymptomatic women by screening mammography does not seem possible. This is because there are considerable financial constraints and the infrastructure, machines, and clinicians (radiologists, radiographers, pathologists, etc.) are just not sufficient in numbers to cater to the rapidly increasing population in the country. Therefore, the problem must be dealt with from a different angle. As most symptomatic women present with advanced disease stage, clinicians skilled in all aspects of the diagnosis and treatment of breast disease are required. The Australasian Society of Breast Physicians has developed a formal three year training model for General Practitioners to qualify as Breast Physicians (ASBP, 2007). The program has been functioning for about 20 years now. The skills of the breast physicians can be used to detect the disease at an early stage in its natural history.

Considerable work is being done in other parts of the world on how to investigate a new breast symptom (California Department of Health Services, 2005; IBS-NBOCC, 2006; Pinkney et al., 2007). A flowchart meant to demonstrate the processes of elimination, which could be used in the Pakistani society, in the form of a decision free, is shown in Figure 1.

It is recognized that evaluation of breast symptoms requires a time consuming and multifaceted process of elimination and the vast majority of symptomatic women are found to have a benign disease. In a report from Europe (Pinkney et al., 2007), of the 4,366 new referrals seen in the symptomatic breast clinic, 13% (571) were found to have breast cancer as opposed to 87% having a benign outcome.

Additionally, throughout the diagnostic process, women are frequently very anxious and require emotional support as well as extensive discussions to understand the process they are undergoing. A significant amount of time is required to explain the options and treatment for women diagnosed with breast cancer. In a one-stop multidisciplinary setting, and with the understanding of all the disciplines and processes involved in the diagnosis, management, and treatment of breast disease, a breast physician can expedite and facilitate the diagnosis, as well as support the woman throughout the process.

Through the aforementioned program, designed to prepare clinicians to become breast physicians (ASBP, 2007). the GPs develop their skills in the following areas:

·clinical breast-examination;

· interpretation of mammography and breast ultrasound;

·performance of image-guided interventional procedures such as fine needle aspiration biopsy, core biopsy, and preoperative needle localization;

·counseling of women with breast cancer;

·planning/coordinating treatment of females with breast cancer;

·assessment/monitoring of women at potentially 'high-risk' of cancer by virtue of their family history of breast cancer or those previously having received treatment for breast cancer; and

·working in consultation with breast surgeons, radiologists, pathologists, oncologists, geneticists, and other members of the multidisciplinary team.

Conclusions

SKMCH & RC has a functioning one-stop breast clinic, staffed by members of the multidisciplinary team including pathologists, radiologists, surgeons, and breast care nurses. At the one-stop breast clinic, women presenting with symptoms or without any symptoms of breast diseases, are managed. Depending on their history, females may be requested to undergo mammography,

ultrasound, and biopsy, as and when indicated. As results of the investigations are obtained, women are given instructions on how to proceed with the matter.

Early detection and management of breast lesions can be facilitated by setting-up easily accessible, one-stop, symptomatic breast clinics, staffed by trained Breast Physicians, within the community. This may help reduce morbidity and mortality from breast cancer in developing countries, and may improve both the quality of life and survival.

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