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Mammography Trends in a Tertiary Care Hospital in Nepal

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ABSTRACT

Background: Mammography is an established screening tool for early detection of breast cancer, with several protocols used worldwide. Such screening programs and related data are lacking in less developed countries. We documented and analyzed the mammographic trends at Tribhuvan University Teaching Hospital, a tertiary care referral center, in Kathmandu, Nepal, to develop baseline data which may be helpful in further researches.

Methods: In this descriptive study, imaging findings of consecutive patients who had undergone mammography between July 2016 and March 2018 were reviewed after obtaining ethical clearance from the Institutional Review Committee. Ultrasonography and histopathological examination were done as needed. Demographics, presenting complaints, breast density, Breast Imaging, Reporting, Assessment and Data System category and final diagnosis were recorded and analyzed using appropriate statistical methods.

Results: There were more diagnostic mammograms (62%) than screening with mastalgia the most common presenting complaint. Breast density was less in screening group. Overall, there were more benign lesions with incidence of breast cancer being 4.4% more in the diagnostic group. The age range varied from 22 to 86 years, with 15% (n=219) below 40 years age accounting for one-third of the cases of extremely dense breast and one-fourth of the suspicious lesions. Nearly 50% of breast cancers were seen in patients less than 50 years of age.

Conclusions: The study showed greater number of diagnostic than screening mammograms, with malignancies detected more often in the diagnostic group and younger age. Fewer screening studies suggest a lack of breast cancer awareness in our population who seek medical help only when symptomatic.

Keywords: BIRADS; Breast Cancer; Mammography

INTRODUCTION

Breast cancer, the second leading cause of cancer related female mortality around the world has excellent prognosis when diagnosed early. Mammography, an established screening tool for cancer detection, is less sensitive in women with dense breast tissue which itself is a risk factor for cancer.[1] Sonography is a well-known adjunct to mammography in young patients or those with mammographically dense breasts.

In Nepal, while the number of breast cancer patients are increasing, presenting at a younger age with higher stage disease and larger collaborative researches are needed, extremely few studies have been done.[2] With our limited resources, we need to increase awareness among women to promote self and clinical examination, opportunistic screening, and develop our screening strategies according to the specific variations in our population utilizing both sonography and mammography.[3]

In this study, we analyzed the demographics, indications, density and mammographic findings to understand the trends among patients coming for mammography in our tertiary care hospital.

METHODS

In this descriptive cross-sectional study, we analyzed imaging findings of all patients who had undergone mammography in Department of Radiology, Tribhuvan University Teaching Hospital between July 2016 and March 2018. Ethical clearance was obtained from the Institutional Review Committee of Institute of Medicine. Verbal consent was obtained from patients and confidentiality maintained. Convenience sampling

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was used and consecutive patients who underwent mammogram in the department and agreed to participate in the study were included. Those with past breast surgeries deforming either breast rendering mammogram interpretation difficult, or with dense breasts lost on follow up were excluded from the study. Mammography was done on Computed Radiography Mammography system Venus+ obtaining standard cranio-caudal and mediolateral oblique views with additional spot compression and magnification views as needed. The mammograms were interpreted by radiologists with more than seven years of experience. Patients whose mammography findings deemed necessary further imaging, underwent ultrasonography of breast using high frequency (7.5-10 MHz) linear probes in the routine planes. Information regarding study variables, namely, demographics, indication, mammographic findings, available additional imaging findings, that is, ultrasound and cytology or histopathology findings was obtained and recorded in predesigned proforma.

The indications were categorized as screening or diagnostic as mentioned on the referral forms of patients. Typically, screening mammogram includes asymptomatic women older than 40 years of age depending upon the national guidelines. However, in the absence of any such guidelines in Nepal, we included all the females who were – (a) asymptomatic, or (b) postoperative and referred for screening to look for presence or recurrence of breast cancer as the screening group. Diagnostic group included all those with any complaints pertaining to breasts like mastalgia, lump, nipple or skin lesion, discharge, cancer, etc.

The breast density was evaluated as per the American College of Radiology (ACR) categories: a- fatty, b -scattered areas of fibroglandular tissue, c- heterogeneously dense and d-extremely dense.[4] The mammography interpretation was done as per the American College of Radiology- Breast Imaging, Reporting, Assessment and Data System (BIRADS) criteria on basis of increasing possibility of malignancy.[5] As such, dense breasts needing further imaging methods for evaluation was categorized as BIRADS 0, normal as BIRADS 1, benign findings as BIRADS 2 and probably benign findings with less than 2 % chances of malignancy as BIRADS 3. Suspicious mammograms were BIRADS 4, being further subcategorized into 4a, 4b and 4c based on chances of malignancy varying from 2-10%, 10-50% and 50-95%, respectively. The mammograms with high probability (>95%) of malignancy were BIRADS 5 while malignancy proven were BIRADS 6. The category 4 and 5 cases were recommended for histopathological examination, that is, aspiration cytology or biopsy with or without imaging guidance to confirm the diagnosis. BIRADS 0 category was considered indeterminate and further sonography was done.

SPSS 20 and simple statistical methods were used for data analysis. The density distribution in the screening and diagnostic groups as well as among various age groups, was studied for any statistical difference using Chi square test.

RESULTS

A total of 1429 patients were included of which 1425 were females and four males. The mean age of the female patients was 47.6 years ranging from 22 to 86 years, with 15%(n=219) below 40 years age. Age distribution in screening and diagnostic groups is shown in table 1. The mean age of the patients with benign findings on pathological evaluation was 46.9 years ranging from 30 to 68 while that with malignant pathology was 48 ranging from 28 to 86 years.

Table 1. Age distribution in the diagnostic and screening groups.

Age (years)	Diagnostic	Screening	Total (n=1425)
20-30	8	1	9 (0.6%)
30-40	155	56	211 (14.8%)
40-50	449	233	682 (47.9%)
50-60	181	173	354 (24.8%)
60-70	69	61	130 (9.1%)
70-80	17	16	33 (2.3%)
> 80 years	2	4	6 (0.4%)
	881 (61.8%)	544 (38.1%)	

The average age of male patients was 43.5 years. All were diagnostic mammograms- indication being gynecomastia in three cases and breast lump in one. Mammogram showed normal or benign findings in three while in the patient with lump, mammographic findings were consistent with BIRADS 4b lesion and was confirmed as ductal carcinoma on histopathological examination.

Screening was the indication in 38% (n=544) female patients, primary in 439 and postoperative screening in 105. Diagnostic mammography was done in 881 patients with mastalgia being most common (n=424) followed by unilateral or bilateral lump (n=304). Galactorrhea (n=72), axillary lump (n=39), nipple or skin lesion (n=20) and biopsy proven breast cancer (n=15) and miscellaneous like trauma, mastitis were the less common indications

as shown in the figure 1.

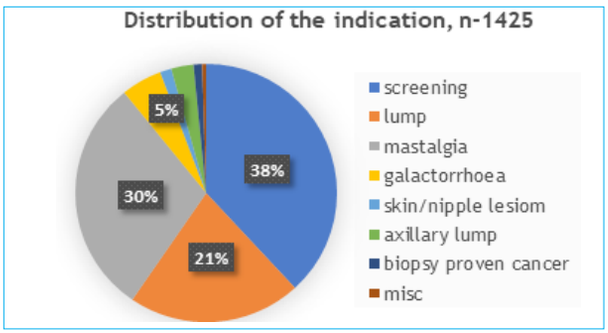

Figure 1. Distribution of the indication for mammogram.

Chi square test was done to assess the homogeneity of distribution of breast density between diagnostic and screening groups which showed significant difference ($p < 0.00001$) in distribution between the two groups. Screening group had more a and b densities as opposed to diagnostic group which had more patients with dense breasts (Figure 2).

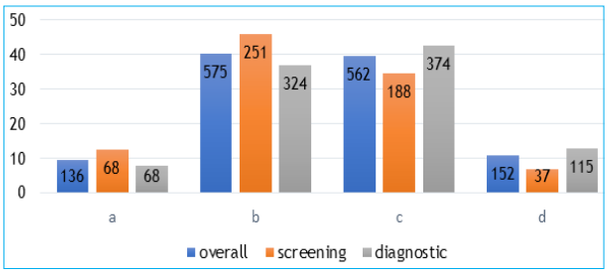

Figure 2. Distribution of breast density in the groups- overall, screening and diagnostic.

Table 2. Table showing distribution of patients categorized in age groups in various ACR BIRADS breast density categories.[4]

Age years	ACR BIRADS breast density categories (n=1425)			
	Cat a	Cat b	Cat c	Cat d
<40	6(0.4%)	54(3.7%)	109(7.6%)	50(3.5%)
40-50	35(2.5%)	246(17.2%)	317(22.2%)	84(5.9%)
50-60	53(3.7%)	185(12.9%)	101(7.1%)	15(1.1%)
60-70	28(2%)	76(5.3%)	28(2%)	0(0%)
>70	14 (0.9%)	14(0.9%)	7(0.5%)	3(0.2%)
Total	136(9.5%)	575(40.4%)	562(39.4%)	152(10.7%)

Extremely dense breast was seen in 22.8 % of cases less than 40 years and 12.3 % of the 40-50 years age group with significantly less numbers in the patients older than 50 years (table 2). Likewise, more than 25% of the BIRADS category 0 were younger patients less than 40 years. Notably, nearly 57 % of the BIRADS 4,5 and 6 categories were accounted for by patients younger than 50 years of age, of which 24.7 % were younger than 40 (Table 3).

In both the screening and diagnostic groups, majority of the mammograms were normal or benign as shown in the table 4. Six of the nine patients in screening and 97 of the 112 patients in diagnostic group, with BIRADS 4 or higher category underwent histopathological diagnosis. Only one malignancy was confirmed pathologically in the screening group which was seen as an irregular high density spiculated lesion in mammogram and qualified as BIRADS 5 category.

Table 3: Distribution of the BIRADS categories in various age groups.

Age (years)	BIRADS categories (n=1425)						
	0	1	2	3	4	5	6
<40	26	102	38	23	16	7	7
40-50	66	314	183	80	25	11	3
50-60	8	167	132	21	14	11	1
60-70	1	42	63	10	10	4	2
>70	3	8	15	2	4	4	2
	104 (7.3%)	633 (44.4%)	431 (30.2%)	136 (9.5%)	69 (4.8%)	37 (2.5%)	15 (1%)

Table 4. BIRADS category distribution of the overall, screening and diagnostic mammograms.

BIRADS category	0	1	2	3	4	5	6
Overall (n=1425)	104 (7.3)	633 (44.4%)	431 (30.2%)	136 (9.5%)	69 (4.8%)	37 (2.5%)	15 (1%)
Screening (n=544)	36 (6.6%)	289 (53%)	183 (33%)	27 (4.9%)	8 (1.4%)	1 (0.1%)	0 (0)
Diagnostic (n=881)	68 (7.7%)	344 (39%)	248 (28%)	109 (12%)	61 (6%)	36 (4%)	15 (1.7%)

None of the 136 patients with BIRADS 3 lesions, who underwent histopathological diagnosis, were malignant. There was an increasing trend of malignancies with increasing BIRADS category, being 11 % in category 4b, about 60% in 4c and nearly 97% in 5 (excluding the cases lost to follow up). Notably, there were no malignant diagnosis obtained in any of the 24 cases in category 4a.

Overall, there were 4.4 % malignancies with 6.9% (n=61) in the diagnostic group and 0.18% (n=1) in screening group. The presenting complaint of most of the patients in the diagnostic group with malignant lesions was lump while only one of the patients presented with bloody nipple discharge. Notably, three of the patients had undergone excision of probably benign lesions which were found to be malignant on histopathology and referred for further workup. Five patients with higher than 50% probability of malignancy (BIRADS 4c and 5) were lost on follow up. While most of the malignancies were invasive ductal carcinomas, there were two cases of lobular carcinoma, one metaplastic and one malignant phyllodes. Among the benign lesions, fibrocystic disease followed by fibroadenomas were the most common diagnosis.

DISCUSSION

In Nepal, there are no breast cancer screening programs implemented at any scale. Few surveys on breast cancer awareness concluded that access to mammography is limited only to a small group in Nepal.[3] This is in contrast to the developed countries where screening programs cover nearly the complete population. The women coming for screening mammography are a very small number including those who are aware of its benefits, have mammography facility available and can afford it. The high sensitivity of mammograms to detect very early cancers reduces with increasing breast density particularly in the younger patients who usually have more fibroglandular tissue.[6] Dense breasts not only mask underlying lesions but are a risk factor for cancer.

In our study, about 38% patients presented for screening while majority of the indications were diagnostic. We found an increase in the number of screening mammograms compared to one done previously in a similar population, where it accounted for about 25.8% which suggests increasing awareness.[7] There was one screening detected cancer in our study compared to none in the previous. Surprisingly, the numbers in our screening group lag behind some other developing countries.[8] This could be due to the conservative nature of our society preventing women from seeking opportunistic screening.

In our study, slightly more than 15% cases were younger than 40 years who accounted for about 23 % of the extremely dense breasts and 25% BIRADS 4, 5 or 6 category. While worldwide 6.6% of the breast cancers occur in patients younger than 40 years, in Nepal nearly a quarter occur in this age group.[9-11] In a comparable study by Madhok R et al., there were higher number of dense mammograms (41%) which may be explained by the higher percentage of patients younger than 40 years in their study group. Mastalgia was also the most common indication with a greater frequency compared to ours.[12]

More than 50% of breast cancers occurred in younger population less than 50 years of age in our study. A quarter of the extremely dense breasts and BIRADS 0 category were also accounted for by the less than 40 years age group. Younger patients have more dense breasts with more radiosensitive fibroglandular tissue.[13] This group of patients need multimodality imaging using sonography which is being used as an adjunct to mammography for cancer screening.[14,15] In symptomatic patients younger than 40 years, sonography has a role as a primary modality with mammography and MRI serving to look for extent or multifocality.[16]

There are various screening guidelines worldwide: Guidelines from the American Cancer Society, Society of Breast Imaging, the American Medical Association and the American College of Radiology recommend annual screening mammography for women, beginning at age 40 while the United States Preventive Services Task Force suggests biennial screening for women between 50-74 years.[17] Additionally, the American College of Radiology suggests a risk assessment for women at 30 years of age and individualized supplemental screening with screening as early as 25 years of age in those at high risk.[18] Notably, the lifespan of an average Nepalese female is about 70 years and nearly half of cancers in our population are being diagnosed in patients younger than 50 years of age. Considering these facts, clearly the protocols recommending screening from 50 years of age are not applicable in our population.

Asha Jyoti, a mobile women's health outreach health program is being carried out in collaboration with RAD-AID international in Chandigarh, Punjab, India, since 2012 and provides mass screening to underserved women for breast cancer, cervical cancer and osteoporosis. Similar programs maybe effective in increasing awareness while providing the basic health care services in our population, though, implementation of such a program in Nepal may be limited by the variable and hilly terrain.[19]

CONCLUSIONS

Mastalgia and lump were the most common presenting complains in diagnostic group. There were higher number of benign breast lesions compared to malignancies only one of which was detected on screening. The higher number of diagnostic than screening mammograms and breast cancers in patients younger than 50 years, suggest a lack of breast cancer awareness in our population who seek medical help only when symptomatic. Promoting opportunistic screening by increasing awareness, and mass screening programs employing clinical examination and multimodality imaging may be the way ahead for reducing impact of breast cancer.

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