Clinico-pathological Correlation of Breast lumps in Mauritian women

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Abstract: *Worldwide breast lumps are a common cause of concern for patients as well as for clinicians. Throughout the world relatively few studies are conducted on benign breast diseases as compared to reporting rates of breast cancer. The aim of this study was to characterize the breast lumps seen in Mauritian women and to establish the correlation between clinical features of breast lumps and their pathological diagnosis. This study was reported for the first time from Republic of Mauritius. Totally 95 women with breast lumps were studied at a tertiary teaching hospital in Mauritius between 2010 and 2012. 26 women were less than 30 years of age and rest were above 30. Majority discovered the lump by themselves and more than 80% presented to the care provider after 4 weeks. There were 29.5% of malignant lumps and 70.5% of benign lumps. Fibroadenoma was most common in women less than 30 years age group. Most of the cancers were in patients above 30 with one exception. The major risk factor that was significantly associated with malignancy was overweight. Clinical examination had a sensitivity of 71% and specificity of 75%. It was accurate to differentiate malignant from benign lumps. Fine needle aspiration cytology (FNAC) had a sensitivity of 80%.*

Keywords: *Breast lumps, Breast cancer, Benign lumps, Malignant lumps.*

I. Introduction

Breast cancer is the most commonly diagnosed cancer in women throughout the world [1]. Benign breast disease is far more common than breast cancer. Even if the incidence is lower in developing countries, a significant rise has been noted in Asia and Africa over the last few years [2]. Consequently, there has been rising awareness among women regarding this major health issue.

Benign breast disease has a prevalence and impact on women's quality of life. 50% of women will develop some form of benign breast disease during their lifetime [1]. However, 1 in 9 of those presenting with a breast lump will be diagnosed as breast cancer [1]. Since it is not as yet preventable, its early detection gives the patient the best chance of a cure.

The risk factors for breast cancer are numerous and can essentially be divided into hormonal, non-hormonal and genetic risk factors [3]. Patients with a benign lump but having a family history of breast cancer also have an associated increased relative risk for cancer. 50% of breast cancer patients do not have any specific risk factors [3].

Hence, breast screening programs have been implemented in many parts of the world. Many patients end up having unnecessary biopsies [4]. Breast self-examination raises breast awareness but does not reduce breast cancer mortality [5]. The most effective approach to screening is yet to be defined.

In Mauritius, there is no national breast cancer screening as such. Screening mammography is not done in the public health service. Women have the option to get a clinical breast examination done by community physicians. Any breast abnormality detected is referred to the surgical department of the nearest hospital for evaluation.

These breast lumps represents a heavy workload that the surgical department has to deal with, in a context of limited resources. The implementation of the triple diagnostic test to all breast lumps is not practicable as it would result in a delay in treatment. Hence, there is a compelling need for prompt assessment and triage of these patients to carry out early pathological examination on those patients that are more likely to have breast cancer.

The objective of the present work was to study the clinicopathological correlation of breast lumps in Mauritian women.

II. Materials & Methods

This was a prospective study of the clinical evaluation of breast lumps conducted at Jawaharlal Nehru Hospital (JNH), Rose Belle, Mauritius. The period of study was over 2 years between Dec 2010 and Dec 2012. A total of 101 cases with the following criteria were chosen at random from patients attending the outpatient department of the hospital.

Inclusion criteria –
        Any female patients attending the surgical department directly or referred with a definite breast lump, a total of 95 cases.

Exclusion criteria –
1. Patients presenting with superficial skin lesions such as sebaceous cyst and skin papilloma.
2. Pre-pubertal females with breast buds being perceived as lumps.
3. Drop out of 6 patients.

        Data collection started after approval of the study by the ethics committee. Different modalities were used for the assessment of breast lumps namely clinical assessment, imaging and pathological examination.
        Data collected were analyzed and the following variables were studied:
- Age distribution of the different types of lumps.
- The ratio of benign to malignant lumps.
- Ethnicity, background, marital and parental status.
- Duration of lumps. Presentation > 4 weeks was considered late.
- Clinical features and any association with malignancy.
- Imaging interpretation accuracy
- FNAC accuracy
- Few risk factors for breast cancer were also studied in our series to determine any association.

        Clinical assessment included the full history of the patient pertaining to the present, past, gynaecological and family history. Clinical breast examination was done after obtaining consent and in the presence of a chaperone. Lumps in the breast were described by their:
- Location in one of the 4 quadrants
- Size- largest diameter
- Tenderness
- Consistency – hard, firm, soft
- Fixity to skin or underlying structures

        After clinical examination some patients were sent for imaging, either ultrasound or mammography or both. All patients underwent pathological assessment either by FNAC or biopsy or both. Biopsies included either core biopsy or surgical excision biopsy. After the pathological assessment patients were reviewed in the out patients clinic with their pathology report to plan any further treatment.
        The occurrences of different variables were given in absolute figure and also in percentages where appropriate for comparison. The statistical package used in this study was SPSS version 19.

III.   Results
        In the two and a half year study period clinical data were collected from 101 patients presenting with a breast lump. It was unable to have final pathological diagnosis on 6 patients as they did not come back to hospital for the completion of assessment. Ultimately final diagnosis was made on 95 cases.
        Of the 95 patients 26 were less than 30 years of age and 69 were above 30. Most of them had a basic level of education. The majority were Hindus (61%) followed by Christians and Muslims. Most of them (80%) were married. Of the 95 patients, 72 (75.8%) had children.
        The duration of lumps was ranging from 1 to 156 weeks with an average of 18.6 weeks. Overall only 14 of the 95 patients consulted with less than 4 weeks after noticing lump. The late presentation (after 4 weeks) was similar in both age groups: 23 in those < 30 and 58 in those > 30.
        Breast lumps occurred in all age groups. Then there was a peak of 31 cases in the 40-49 age groups. At the end of the study of 95 patients, we noted that 67 had benign lumps whereas 28 had malignant lumps. This represents a majority of 70.5% for benign breast lumps. Most of the malignant lumps were in patients > 30 years of age with one exception that occurred in a 19 year old. The most number of cancers (14 cases) were in the patients of 40-49 age groups (Table-1).
        As for benign lumps, fibroadenoma was the most common benign lesion occurring in 73% of cases those under 30 years. The next common was fibrocystic change (20%) in those cases above 30 years of age, followed by cysts and mastitis. There was 1 case of phyllodes tumour in a young woman (Table-2).
        In our study of 95 patients, 48 had a lump in the left breast, 41 in the right breast and 6 had bilateral lumps. On comparing the location of the lumps, 15 of the 28 malignant lumps (53.6%) were in the upper outer quadrant as compared to 18 of 67 benign lumps (36.7%). 3 of the 28 malignant lumps (12%) were painful as

compared to 20 of 67 benign lumps (29.8%). 2 malignant lumps were tender as compared to 18 benign lumps. Therefore pain and tenderness did not correlate to the benign nature of a lump in our study.

In our study the size of the lumps was in the range of 0.5 to 10 cm. 36 patients noticed an increase in the size of their lump and 11 reported a decrease in size over time. 57% of malignant lumps and 30% of benign lumps increased in size. There was no reduction in size for malignant lumps whilst 16% of benign lumps showed size reduction. 61 lumps were equal to or less than 2cm and these were mostly seen in the age group < 30. 28 lumps were greater than 2cm and up to 5cm, these were seen mainly in the age group > 30. Lumps greater than 5cm were less (6 in no.) mostly was seen above age of 30 (Table-3).

The lumps were described as hard, firm or soft. There were 41 hard, 38 firm and 16 soft lumps. Most of the malignant lumps were hard. Of the 28 malignant lumps 20 (71%) were irregular whereas only 13 (19%) of 67 benign lumps were irregular. Half of the malignant lumps were fixed to surrounding structures as compared to 9% of benign ones. Nipple changes were observed in 8 of the malignant lumps and in 6 of the benign ones. 18% of malignant lumps had associated skin changes whereas these were seen in only 4.5% of benign ones. After assessing the various characteristics of the breast lumps, an overall impression was to each patient as to the likeliness of cancer.

Of the 95 patients, 32 had imaging done. 12 of them had diagnostic mammography and ultrasound examination of breast. 20 had only ultrasonography. Among 32 cases 3 were malignant, the rest were benign. All underwent pathological analysis of the lumps. They either had FNAC or core biopsy of the lump. 17 cases underwent both. FNAC was suggestive of malignancy in 8 breast lumps and benign in 5 breast lumps. Of the 4 inconclusive FNAC, 2 were malignant and 2 benign. FNAC had a sensitivity of 80% and did not classify any malignant lump as benign (Table-3).

Overall, few of the cases had risk factors for cancer. Of these overweight (BMI > 25) was considered significant. 57.7% of malignant lump cases were overweight as compared to 24.6% of benign lump.

IV. Discussion

Until now data regarding the spectrum of breast diseases in Mauritius has been very limited. It is also applicable for countries of Asia and Africa where because of lack of resources the priority has been to keep a registry of breast cancer whereas the true extent of all breast diseases is not known [2]. The strength of our study was that those 95 cases were taken at random over a 2½ year period. Ethnically, the women were mainly of Indian origin and blacks [6, 7]. .

4.1 Age –
In our study the enrolled women were with a wide age range between 14 and 79. The mean age was 40.5 years old and 27.4% of our patients were less than 30 years old. However one of the patient aged 19 was diagnosed with a breast cancer. Therefore for comparison of some variables in the study, the patients were subdivided into a young age group of less than 30 and older age group of more than 30. This study is similar to studies of [7, 8], were age range of 14-70 and mean age of 41years were reported respectively.

4.2 Malignant lumps –
Malignant lumps were diagnosed at a mean age of 50.8 years in our study which is higher than most of the other studies [7, 8, 9] except for [10] where cancer occurred at a mean age of 54. Moreover the peak presentation was noticed in the 40-49 age groups which conform to earlier studies carried out in a non-white population [7, 8, 9]. 29.5% of our patients had a malignant lump, which is well above the 10% of breast lumps in western countries. In the younger age group there was 1 case (3.8%) of breast cancer which is comparatively lower to the studies of Muneer et al [11] of 11.8%.

4.3 Benign lumps –
4.3.1 Fibroadenoma –
 In our series 25% of all breast lumps were fibroadenoma and was diagnosed at a mean age of 23. Of the benign lumps fibroadenoma was the commonest (1 in 3cases). Two studies [7, 9] had a higher rate compared to our study. In the young age group 73% had fibroadenoma. This conforms to the other studies 72% [12] and 67% [6] respectively. It differs from the low rates of other two studies like 33% [13] and 43.9% [11] respectively. These results may be explained by differences in ethnicity in these studies.

4.3.2 Fibrocystic change –
In our series 17% of benign lesions were fibrocystic changes which was comparable to the result of Siddiqui et al [8] who reported 14%. In the young age group fibrocystic changes were observed in 7.6% of patients. Other studies [14, 15] showed an occurrence of 11-12% fibrocystic changes which is comparatively similar to our results.

4.3.3. Inflammatory conditions – Seven percent of our patients had mastitis and most of them were above 30 years old. This incidence was lower compared to the other studies [8, 9, 10] except for Ayoade et al [7], who noted mastitis in only 2.5% of their patients.

4.3.4   Other benign – Other benign lumps were rare in our and other studies. Rare entities included phyllodes tumor, fat necrosis, galactocele, lipoma and sclerosing adenosis. Therefore it was difficult to compare these results.

In general in western countries, 90% of lumps are benign. The largest number of women with benign condition present with fibrocystic changes (38%), cysts (15%), fibroadenoma (13%), inflammatory (8%) and few other entities [16]. Fibradenoma constitute the majority of benign lumps in African and Asian countries [17] as it was also the case in our study. Fibrocystic changes and inflammatory changes were the main categories of other lumps.

4.4 Self-detection of lump –

Most of our patients (94%) detected their lumps by themselves and the others were noticed on screening by clinical examination by a doctor. This self-detection rate is very high as compared to the 53% rate of study in California by Vargas et al [12]. Therefore in these developed countries it is possible to work out the true proportion of women self-detecting their lump. It was not sure to say that what extent Mauritian women were aware of breast problems and of the need to consult in the presence of a lump. There might be a significant number of women not attending the care provider.

4.5 Delay in presentation –

In our series 85% of patients presented after 4 weeks and this were apparent in all patients irrespective of the benign or malignant nature of the lump. In a study [18] carried out in England, 35% of women had a delay of > 4 weeks in attending breast clinic. They concluded that patient beliefs about their disease were the main factors for the delay and not the ethnicity or socio-economic background. In Mauritius, it is equally possible that many women believe that a breast lump is not serious reason to seek medical advice. It has to be pointed out that there is no developed primary care health system in Mauritius and this could also explain the delay to attend hospitals.

4.6 Symptoms & presentation –

Most of the patients presented with a lump. Only 23 of them had pain in the breast. 3 patients also had nipple discharge; including one with bloody discharge (One had cancer & the other two were cases of mastitis). There was no association between breast pain and breast cancer. The study of Ayoade et al [7] found an association between the two and reported it was due to advanced stage of their presentation.

There was correlation between nipple abnormalities and malignancy in our study. The larger size of malignant lumps as compared to benign lumps was also noted. These are features of late presentation of patients. Benign lesions were mainly mobile except for large inflammatory lesions. As for malignant lumps the fixity to underlying structures as well as skin changes was more apparent. Overall our clinical examination was good at differentiating malignant from benign lesions. The sensitivity of the clinical examination to detect malignant lumps was 71% and specificity was 75%. This can be compared to study of Steinberg et al [19] reporting a sensitivity of 67.4% and specificity of 95.4%.

4.7 Imaging –

In our study, one third of patients (33.7%) benefited from imaging. These investigations were quite accurate in differentiating malignant from benign lesions. As only 3 patients of the cancer patients underwent imaging as compared to 29 with benign lumps, it was unable to carry out statistical analysis. However the use of imaging was a good tool to assess breast lumps.

4.8 Pathological examination –

In this study, FNAC had a sensitivity of 80% to diagnose a malignant lump. However correlation between FNAC and biopsy results was carried out in only 17 patients. This is comparable to the results of earlier study [20] which reported a sensitivity of 82%. Even though cytological examination will miss some cancers, its combination with core biopsy improved the sensitivity to 97%.

4.9 Risk factors for breast cancer –The women in our study were from a rural area. They were nonsmokers and do not take alcohol. Very few gave a family history of breast cancer or took hormonal treatment for contraception. A majority of them were above 30 years old married and had children. Therefore the cases were limited to carry out statistical analysis of all risk factors.

Age at menarche, overweight, breast feeding and age at first pregnancy were studied in patients. The only risk factor that was of statistical significance was overweight. The results were comparable to study reported by Pakseresht et al [21]. The risk factors described in western countries on a white population were not applicable.

V.   Tables

1. Age distribution of Cases and Lumps

Type/Age	<20	20-29	30-39	40-49	50-59	60-69	>70	Total
No. of cases	12	14	14	31	12	8	4	95
Malignant	1	0	1	14	4	5	3	28
Benign	11	14	13	17	8	3	1	67
Malignant (%)	8.2	0	7.1	45.2	33.3	62.5	75	29.5

2. Distribution of Benign lumps

Benign lumps	<30	>30	Total	Mean age
Fibroadenoma	19 (73%)	5 (7.2%)	24 (25.2%)	23 yrs
Fibrocystic changes	2 (7.6%)	14 (20%)	16 (16.8%)	42.7 yrs
Cysts	2 (7.6%)	8 (11.6%)	10	45.2 yrs
Mastitis	1 (3.8%)	6 (8.7%)	7 (7.4%)	38.7 yrs
Benign (other)	0	2	2	51.5 yrs
Lipoma	0	2	2	51.5 yrs
Sclerosing adenosis	0	2	2	42.5 yrs
Galactocele	1	0	0	26 yrs
Phylloides	0	1	1	49 yrs
Abscess	0	1	1	33 yrs
Fat necrosis	0	1	1	50 yrs
Total	25	42	67	41.1 yrs

3. Description of Breast lumps (p<0.05 is significant)

		Benign	Malignant	Total	P value
Lump size	< 30 yrs 20 0.5 – 2cm >30 yrs 41	49	12	61	< 0.05
	< 30 yrs 5 2 – 5 cm > 30 yrs 23	14	14	28	< 0.05
	< 30 yrs 1 > 5cm >30 yrs 5	2	4	6	< 0.05
Clinical Entity	Clinically Benign Clinically Malignant Uncertain	50 13 4	7 20 1	57 33 5	< 0.05
Weight	Overweight Normal	20 46	18 11	38 57	< 0.05

VI.   Conclusion

The clinicopathological profile of breast lumps in women in Mauritius is comparable to those studies reported on women of Indian origin. There is higher proportion of malignant lumps in comparison to western countries. Fibroadenoma and fibrocystic changes are common benign lumps encountered.

Breast cancer was ten times more common in older age group than in younger age group. However caution is needed before generalizing our findings as one teenage girl developed cancer contrary to expectations.

Certain features of the clinical examination allowed accurate differentiation of malignant lump from benign disease. However the need to detect cancer at an early stage remains an unresolved issue as patients tend to present late. Overweight stood out as a one of the risk factor.

It is concluded that although the probability for a woman in Mauritius to develop breast cancer is not known, it would be helpful to have larger studies to determine the extent of the disease especially in young age groups and to establish other risk factors.

VII.   Limitations Of The Study

Only patients attending the hospital were enrolled. It is not possible to know how many patients with a lump did not attend the hospital. Only 32 patients had imaging done. In view of only 28 cases of breast cancer in this study, it was not possible to do statistical analysis for all risk factor variables. Despite these caveats the major aims and objectives of the study was achieved.

Acknowledgements

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