

Positive Finding and Risk Factors for prediction of Breast Cancer: A Study from Mammographic X - Ray Examination at a Selected Private Hospital, Sri Lanka.

#P Sathyathas¹, H.M.I.S.W Herath², R Tudugala¹ and W.K Hewapathirana

¹Department of Radiography & Radiotherapy, Faculty of Allied Health Sciences,
General Sir John Kotelawala Defence University, Sri Lanka

²Postgraduate Institute of Science, University of Peradeniya, Sri Lanka

³Department of Radiology, District General hospital, Negambo, Sri Lanka

<pthas88@gmail.com>

Abstract— Mammography is the x-ray examination of the human breast and most effective examination for detection of breast cancer. Our main aim of this study was to identify the more predicted risk factors to positive finding for breast cancer. This was a cross sectional study describing the risk factors for positive finding of breast cancer and their association among Sri Lankan women who underwent mammography examination. Data was collected from 1st of August 2015, for six months at a selected private hospital, in western part of Sri Lanka. Structured questionnaires were distributed among the patients prior to mammography x-ray examination. It has included demographic information of patients and sign and symptoms, surgery related risk factors and other related factors was considered as associated risk factors for breast cancer. All mammographic images were interpreted and reported by well experienced radiologist at particular hospital. Mammographic examinations were performed on 213 consecutive women, among them 120 women diagnosed as positive for breast cancer. 41 (34.16%) women came for screening and 79 (65.83%) for diagnostic mammograms. Among the positive diagnosis of women 65 (54%) had pain and 62 (51.6%) had palpable mass in their one or either breasts; changes of shape in breast was observed in 27 (22.5%), 46 (38.4%) had none or low breast feed, 81 (72.5%) use contraceptive pills, 67 (55.8%) have family history of breast cancer and 71 (59.16%) were in menopause period. A binomial logistic regression has performed to see the factors which can be predicted towards the positive finding, The Hosmer-Lemeshow test shown that in the model fitted data well, ($p=0.544$). Non or lack of Breast feed, usage of contraceptive pills and family history shown statistically significant ($p < 0.05$) in predicting positive finding. However, pattern of menses not statistically significant ($p > 0.05$) predictor.

Study concluded that pain and palpable mass or lump are good indicators and, It is evident that mammogram being positive is 7.18 times higher in those with family history of breast cancer than those without a family history.

Furthermore family history of breast cancer, usage of contraceptive pills and none or lack of breast feed were identified higher risk factors in predicting the positive finding to breast cancer.

Keywords— Mammography, Risk factors and Positive finding

I. INTRODUCTION

Mammography is the x-ray examination of the human breast which is believed as most effective examination for detection of breast cancers in their early stages, which is the most common cancer among women all over the world (National Breast Cancer Centre ;2006: The National Cancer Institute ;2006). Breast cancer is an important cause of death among women . According to the American Cancer Society, the chances of an American female developing breast cancer in her life time is about 14% Researchers agree that early detection of breast cancer can save many lives every year (National Breast Cancer Centre ;2006: The National Cancer Institute ;2006) . However, when compared with other cancer types, breast cancer is detected in the later stages because, in most cases, there are no signs or symptoms of the disease during its early stages. Early detection through mass screening with mammography has the potential to reduce mortality, but it also leads to over diagnosis and overtreatment

Breast tissue undergoes a variety of changes with age. Age-related lobular involution, or physiologic atrophy of the breast, is a process where in there is a reduction in the number and size of the acini per lobule and replacement of the intralobular stroma with dense collagen and, ultimately, fatty tissue (Hughes LE and Mansel RE; 2000: International Atomic Energy Agency; 2009). Breast density, a measure of the extent of radiodense fibroglandular tissue in the breast, has the potential to be used as a predictor of breast cancer risk, to monitor risk lowering interventions and as an intermediate end point in studies of breast cancer aetiology.

Our main aim of this study was to identify the most associated risk factors which can help to predict the positive finding for breast cancer.

III. METHODOLOGY AND EXPERIMENTAL DESIGN

This was a cross sectional study describing the risk factors for breast cancer and their association among Sri lankan women who are referred to the particular hospital. Data was collected from 1st of August 2015 to 31st January 2016, for six months at a selected hospital.

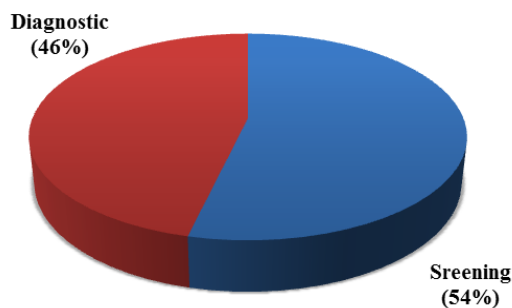
Mammographic examinations were performed on 213 consecutive women. Before the mammographic procedure well-structured questionnaire was distributed among those patients. The questionnaire include three parts demographic information of the patient, type of mammographic examination (screening , routine or diagnostic), sign and symptoms for mammography examination such as pain, lump / cyst / mass, nipple discharge, nipple retraction, changes in the shape of the breast) , surgery related risk factors (hysterectomy, mastectomy, lumpectomy), family history, uses of birth control pills , undergone hormone replacement therapy (HRT) and pattern of menses (regular / irregular / menopause age)

After performed of mammographic examination images were reported by qualified senior consultant in radiologist have experienced more than 20 years. . If those mammograms consist breast cancer it was noted as positive finding.

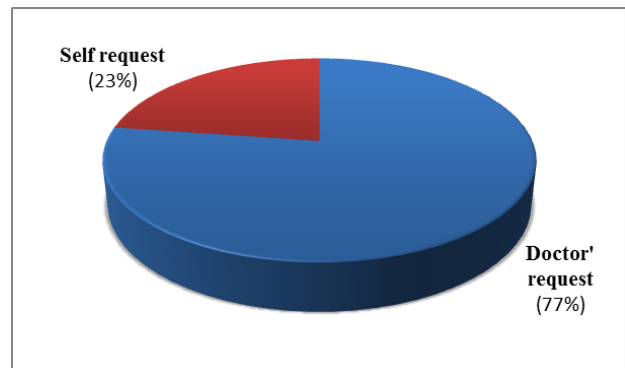
IV. RESULTS

During six months period 213 consecutive women who were referred to mammographic x ray examination was included in this study. The Mean age of women were 51.75 (± 9.5) years old. Age was ranged from 27 years old to 87 years old.

Mammography examinations were classified in to two categories; screening and diagnostic mammograms. Among the total women we performed 109 (54%) screening

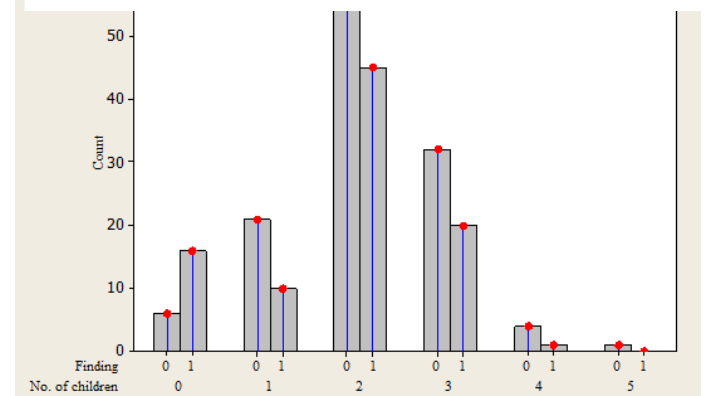


mammograms and 94 (46%) diagnostic mammogram



(Figure 1). 163 (77%) women came to the department to take mammogram requested by doctors while 50 (23%) women by self-made request and body screening packages, So majority of the patients came to the mammographic examination requested by doctor. The Screening age of the patient for mammogram range was 52.77(± 7.86) years and diagnostic mammogram was 50.98(± 9.62) years. So it is the evident most women came for screening mammogram

Figure 2. Referral for mammography examination

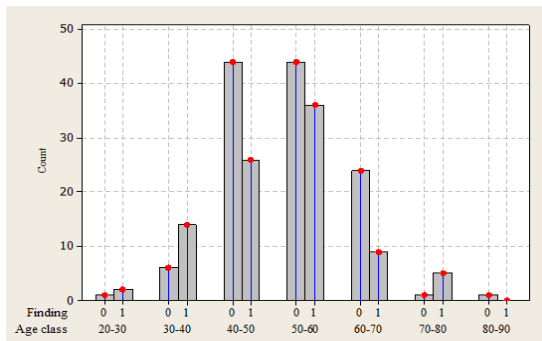


were elderly.

Graph 1. Relationship between the number of children and positive or negative finding for breast cancer

According to our collected data, women who have two children they have higher percentage of chances for positive finding than other stages. If number of children above than 4 none of the women were diagnosed to positive finding.

However, different between the positive finding and negative finding among women who haven't children is higher than any other stages and positive finding for breast cancer is high percentage was observed.



Positive finding for breast cancer is highest in 50- 60 age group. Women, who have age from 30 to 40, have higher chance to develop breast cancer. According to our data

Graph 2. Relationship between the age group and positive or negative finding for breast cancer.

higher numbers of positive findings were encountered at 30-40 age groups than negative finding.

79 women complained about pain in their single breast or both breasts, among them 66 (83.5%) diagnosed as positive for breast cancer. 76 women complained they have palpable mass or cyst in their breast, among them 62 (81.6%) women diagnosed as positive for breast cancer.

Totally 22 women complained they have nipple discharge either from single or both breasts. Among them 17 (77.27%) women diagnosed as positive for breast cancer Nipple retraction was found in 9 women, among them 8 (88.9%) women diagnosed as positive for breast cancer.

We have analysed family history, usage of contraceptive pills, and breast feed and hormone replacement therapy as high risk factors for breast cancer. Total 84 women have the family history of breast cancer among them 67 (79.8%) diagnosed as positive for breast cancer. Among the women who have not history of breast cancer (n= 129), 57 (41.1%) women show positive finding for breast cancer.

usages of contraceptive pills were identified in 89 women in two or more times per year. Among them 81 (91%) was show positive sign for breast cancer. 124 women don't use contraceptive pills, among them 39 (31.5%) was diagnosed as they have breast cancer. In the particular time period every women who visited the department of radiology were married. Total 101 women done or do the breasts feed, among them 46 (4.5%) women show positive finding for the breast cancer while 112 women did not or have done lack of breast feed. Among them 74 (66.1%)

diagnosed as they have positive sign for breast cancer.

77 women they had previous mammogram, among them 47 women identified as positive for breast cancer.

A binomial logistic regression was performed to understand the risk factors which we can predict as positive finding for breast cancer. We assumed main risk factors were none or lack of breast feeding, family history, usage of contraceptive pill, pattern of menses, especially irregular and menopause stages, on Positive or negative sign for breast cancer. The Hosmer-Lemeshow test showed that the model fitted the data well. Family history ($p < .0005$), usage of contraceptive pills ($p < .0005$) and none or lack of breast feeding ($p = 0.834$) were statistically significant predictors for positive finding. However pattern of menses especially irregular and menopause stages were not statistically significant predictors ($p > 0.05$) for positive finding.

V. DISCUSSION

This cross sectional study describes the factors which can contribute significantly towards the positive findings through mammography x ray examination. We consider those risk factors as main classification of age of the patients, type of mammographic examination (screening, diagnostic), most probable sign and symptoms (pain, cyst / palpable mass or lump, nipple discharge, nipple retraction, changes in the shape of the breast) and surgery related risk factors (hysterectomy, mastectomy, lumpectomy), family history, uses of contraceptive pills, HRT and pattern of menses (regular / irregular / menopause).

In this research we analysed the degree of contribution of those factors towards the positive finding through x ray Mammogram. Our results depicts that age of the patient mainly 40-60 years old women have high risk of getting positive finding and we did not find any association between the number of children and positive finding.

We received more patients for screening mammogram than diagnostic mammogram because of the hospital type. In most countries above age 50 screening mammogram is mandatory and women want to follow up. (ref)

Pain and palpable mass or lump are dominant and easily diagnostic able factor for positive finding. According to our results if any woman develops nipple retraction or nipple

Positive finding	Pain		Palpable Mass/Lump/Cyst		Changes in shape		Nipple discharge		Nipple retraction	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
No	13 (6.10%)	80 (37.55%)	14 (6.57%)	79 (37.08%)	88 (41.31%)	5 (2.34%)	88 (41.31%)	5 (2.34%)	92 (43.19%)	1 (0.46%)
Yes	66 (30.98%)	54 (25.35%)	62 (29.10%)	58 (27.23%)	93 (43.66%)	27 (12.67%)	103 (48.35%)	17 (7.98%)	112 (52.58%)	8 (3.75%)
Total	79	134	76	137	181	42	191	22	204	9

Table 1. Relationship between the positive finding and sign and symptoms

discharge, those have more prone to develop positive signs. Family history of breast cancer contributes 7.18 factors higher than others when every other factors are in control. However among the menses irregular and menopause states not significantly contribute towards the positive finding.

Our study deserve some limitation, normally as a standard procedure if there any positive finding in mammogram biopsy will be performed and confirm the extend of lesion and degree of positive finding. But we did not consider the biopsy procedures.

We limit our sample size according to the time frame. So higher number of sample size will give the precise value and results. Every study participants are included from one private hospital and in western part of the Srilanka, however we received patient almost every part of the Srilanka. If we collect our data from multiple centres we can confirm our concluded results.

VI.CONCLUSION

Study concluded that pain and palpable mass or lump are good indicators and, It is evident that mammogram being positive is 7.18 times higher in those with family history of breast cancer than those without a family history. Furthermore family history of breast cancer, usage of contraceptive pills and none or lack of breast feed were identified higher risk factors in predicting the positive finding to breast cancer.

References

Hughes LE, Mansel RE: Breast anatomy and physiology, in Hughes LE, Mansel RE, Webster DJT (eds) Benign Disorders and Diseases of the Breast: Concepts and Clinical Management. London, United Kingdom, W.B. Saunders, 2000, pp 7-20

International Atomic Energy Agency (IAEA) ,Radiation Protection in Diagnostic and Interventional Radiology. L19 Optimization of Protection in Mammography. Available from: www.rpop.iaea.org, accessed 12 March 2009

National Breast Cancer Centre (2006, February). Advice about familial aspects of breast cancer and epithelial ovarian cancer. Retrieved from The National Breast Cancer Centre Website, Australia on 8 August 2007 at <http://www.nbcc.org.au/resources/resource.php?code=BOG>

The National Cancer Institute (NCI), (2006) available from: www.cancer.gov , accessed 12 March 2009