

# Mammography Screening In General Practice - A Pilot Study

C L K Lam\*, FRCGP, FHKAM(Family Medicine)  
 L W C Ho,<sup>1</sup> FRCR, FHKAM(Radiology)  
 S L Douglas,<sup>2</sup> MD, CCFP (Family Medicine)  
 W F Ng,<sup>3</sup> MRCPATH, FHKAM(Pathology)  
 T T Alagaratnam,<sup>4</sup> FRCS (Eng), FRCS(Ed)

## Summary

**Objectives:** To evaluate the acceptability, feasibility and performance of a mammography screening programme for female patients in general practice. **Design:** A cross sectional study. **Setting:** A general practice clinic and a regional hospital in Hong Kong. **Subjects:** 500 Chinese women aged 45 years or older attending a university teaching general practice clinic on Hong Kong Island. **Main outcome measures:** The rates of uptake of screening, retakes, recall for further evaluation and fine needle aspiration (FNA), and participants' opinion on mammography. **Results:** The uptake rate of screening was 37%. Mammography was feasible for all participants, 12% had additional films and 7% required retakes. Sixteen percent were recalled for further evaluation, 4% had FNA, one had an excisional biopsy which revealed no cancer. Most women rated pain of mammography mild to moderate and did not find it embarrassing, 98% said that they would recommend it to their friends and 87% indicated that they would do it again. **Conclusions:** Mammography screening for Chinese women presenting to general practice was technically feasible. Most women found the experience of mammography screening acceptable. The uptake rate of mammography screening was much lower than what would be required to benefit the overall breast cancer mortality. There was also room for improvement in our retake and recall rates. We need to weigh the possible benefit of mammography screening against the stress and resources associated with additional films, retakes, recalls for further evaluation, FNA and excisional biopsy in individuals with false positive results. (HK Pract 1996; 18: 315-320)

**Keywords:** Mammography, screening, Chinese, breast cancer

## 摘要

**目的:** 評估乳腺造影術篩查計劃在全科之女病人之可接受性, 可行性及成效。  
**設計:** 橫切式研究。  
**地點:** 香港一全科診所及一分區醫院。  
**對象:** 500個前往香港一所教學全科診所診治, 45歲以上之女性。  
**測量內容:** 接受率, 覆檢率, 邀回作進一步檢查及細針抽刺檢查; 參加者對乳腺造影術之意見。  
**結果:** 接受率為37%, 乳腺造影術是可行於全部接受者。12%參加者需加照。7%需覆檢。16%被邀回作進一步檢查。4%進行了細針抽刺檢查, 一人需作切片檢查, 但無癌症發現。多數女性認為乳腺造影術之痛楚屬輕微至中等, 亦不覺得尷尬。98%稱會推薦給她們的朋友。87%願意再次檢查。  
**結論:** 將乳腺造影術在全科診所提供予中國女性是可行的。多數女性認為乳腺造影術可以接受。目前之接受率對減低乳癌死亡並無幫助。覆檢率及邀回作進一步檢查率仍有可改進之處, 我們須要權衡乳腺造影術之益處相對於因加照, 覆檢及邀回作進一步檢查, 以致假陽性結果所帶來之壓力, 及資源之需求。  
**主要詞彙:** 乳腺造影術, 篩查, 中國人, 乳癌

## Introduction

Breast cancer is the second most common cancer and cause of cancer death in women in Hong Kong.<sup>1,2</sup>

There were 333 deaths and 1106 new cases of breast cancers in women in Hong Kong in 1991.<sup>2</sup> A woman in Hong Kong has about one in 27 chance of having breast cancer and one in 100 chance of dying from

it during her average life of 80.5 years. Although these rates are lower than the one in 8 morbidity and one in 28 mortality in American women,<sup>3</sup> their steadily rising trend is a cause for concern.<sup>1</sup>

<sup>1</sup> Department of Diagnostic Radiology, Queen Mary Hospital.

<sup>2</sup> Department of Pathology, The University of Hong Kong.

<sup>3</sup> General Practice Unit, Department of Medicine, The University of Hong Kong.

<sup>4</sup> Department of Surgery, The University of Hong Kong.

\* Address for correspondence: Dr Cindy L.K. Lam, General Practice Unit, Department of Medicine, The University of Hong Kong, 3/F, Ap Lei Chau Clinic, 161 Main Street, Ap Lei Chau, Hong Kong.

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The other cause for concern is that most of our breast cancers are stage II or more when they are diagnosed.<sup>4</sup> The prognosis of breast cancers depends on the stage of the tumour. The 5 year survival rate of stage II cancers is only 71%, that of stage I cancers is 84% while that of ductal carcinoma in-situ is 98%.<sup>5,6</sup> Mammography can detect in-situ cancers and early stage I cancers which have better survivals.<sup>7-9</sup>

Several large clinical trials have shown that regular mammography screening can reduce breast cancer deaths in women aged 50 to 74 by about 30%.<sup>7-8,10-13</sup> Regular mammography screening for women over the age of 50 years is recommended in many Western countries.<sup>10,14-16</sup>

Many studies on mammography screening<sup>7-8,10-13</sup> use cancer detection rate as the outcome indicator which is important on a population basis, but the chance of a general practitioner detecting a breast cancer by mammography among his/her one thousand or so female patients is very low. General practitioners more commonly have to deal with making the test available to the target population, giving information about the procedure before screening, following up results, counselling women who require further evaluation, co-ordinating further evaluation, and making referral for appropriate treatment.<sup>16</sup> They need information on patients' acceptability of the test, quality of local mammography service, chances of recalls and fine needle aspiration (FNA), but there is very little local data on these. Most local data on mammography come from specialist clinics on selected groups of patients which may not be applicable to women seen in general practice.<sup>4,17</sup>

This is a pilot study to evaluate the uptake rate, feasibility, patient acceptability and performance of a screening mammography programme

for patients in general practice in Hong Kong. We used the rates of retakes, recall for further evaluation, FNA, and excisional biopsy as our performance indicators. These are commonly used to assess the quality of mammography screening programmes.<sup>10,18-19</sup> We hope the information will help general practitioners counsel their patients and plan their services on screening mammography better.

### Methods and subjects

All women aged 45 years and older attending the general practice clinic of the General Practice Unit, the University of Hong Kong, from December 8, 1992 to May 30, 1993 were invited to take part in the study. A trained interviewer explained to each eligible woman about the objectives of the study and the procedure of screening mammography. Those who agreed to take part then answered a structured questionnaire on their demography, previous experience of breast cancer screening and risk factors for breast cancer.<sup>20,21</sup> Each participant was then given an appointment for mammography at the Department of Diagnostic Radiology, Queen Mary Hospital about 5 kilometres from the clinic. The interviewer called each participant to remind her of the test one or two days before the appointment.

The mammographies were taken by radiographers with special training in mammography under the supervision of a radiologist specialised in mammography. The machine used was a GE Senographe 600T dedicated mammographic unit. Each breast had two standard, the cranial-caudal and medio-lateral oblique views. Normally one film was taken per view per breast but additional films might be necessary for complete imaging of the breasts.

Retakes were done if the films were of poor quality due to technical problems.

All mammographies were read by the radiologist (Ho) and the reports were returned to the General Practice Unit. Each participant was followed up at the General Practice Unit for result and an interview on her opinion of the test. Those who needed further evaluation were given appointments to attend the multidisciplinary mammography clinic at Queen Mary Hospital. All women recalled for further evaluation were examined by the surgeon. Some had additional mammography, ultrasonography or both as indicated. Fine needle aspiration was performed for suspicious lesions found on further evaluation.

The study protocol was approved by the Ethics Committee, Faculty of Medicine, The University of Hong Kong.

All the data were analysed using the SPSS-PC+ computer programme.<sup>22</sup>

### Results

#### Sample

Five hundred women aged 45 years or older were invited to take part in mammography screening, 221 initially agreed but only 184 (37%) eventually turned up for the test. The data of one woman were incomplete and she was excluded from further analysis. The final sample for further analysis was 183.

The mean age of the 183 women screened was 59.5 (S.D.=9.5) years, ranging from 45 to 88. The distribution of the sample by age, education, social class by occupation,<sup>23</sup> and possible risk factors for breast cancer is shown in (Table 1).

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Table 1: Distribution of sample by demography and risk factors for breast cancer

		Proportion of sample (%) (n=183)
Age (yr)	45-49	19
	50-70	67
	>70	14
Education*	Nil	44
	Primary	39
	Secondary	15
	Tertiary	3
Social class	I, II & III	17
	IV & V	83
Age at menarche (yr)	12 or less	7
	13-21	85
	Not remembered	8
Age at menopause (yr)	50 or more	40
	< 50	34
	Pre-menopause	16
	Had hysterectomies	10
Parity	Nulliparity	8
	First birth >29 yrs old	7
Cumulative duration of breast feeding (month)	Never	22
	1-36	33
	37-108	36
	>108	8
	Unsure	1
History of breast disease	Benign	14
	Unsure nature	2
	None	84
Family history of breast disease	Yes	4
	No	94
	Not sure	2

\* percentages do not add up to 100 because of rounding

Thirty percent of the women had heard of mammography and 3 women had the test before. Thirty seven percent had had breast examination by

a doctor before. Nineteen percent had been taught breast self examination (BSE) and 18% had ever practised it.

## Feasibility and acceptability

The programme ran smoothly with patient recruitment, appointments for mammographies and further evaluation, and follow up of results of investigations were coordinated in the general practice clinic. The parenchymal patterns of the breasts of our women were found to be suitable for screening mammography. The mammographic patterns of our women will be discussed in greater details in another paper.

Women were asked about their opinion of mammography after they had the test. (Table 2) shows the distribution of the level of pain of mammography rated on a scale of 0 (no pain at all) to 5 (the worst pain) by the women. Two third of them rated the pain as 2 or less. Eighty-seven percent of them did not find the test embarrassing at all, 13% found it moderately and only one person found it very embarrassing. Ninety-eight percent of them said that they would recommend mammography screening to their friends and 87% of them indicated that they were willing to repeat the screening regularly.

## Performance of the screening programme

Twelve (7%) required retakes because of technical problems. Twenty-two (12%) women required additional films because of large breasts in 18, and difficulties in positioning in two very thin patients and two patients with deformed nipples.

Twenty nine (16%) women were recalled for further evaluation for suspicious mammographic findings as shown in (Table 3). Two women with breast asymmetry refused further evaluation. The remaining 27 women

all had breast examination by the surgeon, 10 had additional mammographies, 11 had additional mammographies and ultrasonographies, and three had ultrasonographies only. Further evaluation found some abnormalities in 10 and no abnormality in 17 of these 27 patients (Table 3).

Among the 10 patients with some abnormalities on further evaluation, the surgeon could feel lumps in the breasts of seven of them. All these 7 patients with palpable lumps had FNA which showed benign cells in

four, insufficient cells for diagnosis in two and atypical cells in one. The patient who had atypical cells on FNA had an excisional biopsy which showed fibrocystic disease. The remaining three patients had benign masses on additional mammographies but no mass was felt on physical examination. They had ultrasonographies which showed no lesion in two and a 1 cm benign mass in one. FNA was not done on these three patients. All ten patients with abnormalities on further evaluation were referred to the specialist Breast Clinic for continual follow up.

## Discussion

The main limitation of our study was the small sample size. On the other hand, this is likely to be the number that an average general practice deals with. We believe that our findings may be applicable to other women of similar age, educational level and social status in Hong Kong. The distribution of the education levels of our sample was similar to that of the general population.<sup>24</sup> The majority of our sample came from the lower socio-economic groups, which is also the case for females aged 45 years or more in the general population.<sup>24</sup>

The uptake rate of screening of 37% was much lower than the 70% considered to be necessary for improving the breast cancer death rates.<sup>7,18-19</sup> The screening was offered to women free of charge, the response rate might even be lower if they had to pay. The low response rate might be due to a general lack of awareness of breast cancer screening in our population. Only 30% of the sample had ever heard of mammography, 37% had ever had their breasts examined by a doctor and only 18% had ever examined their own breasts. Women gave a variety of reasons for refusing the test which would be the subject for discussion in another paper.

The encouraging finding was that most participants found mammography acceptable after they had done it. Very few found the test very painful or embarrassing. Over 90% said that they would recommend it to their friends and 87% said that they were willing to repeat the screening. It seems that if we can motivate women to have the first screening, they may continue and motivate others to take part.

The breasts of our women were suitable for mammography as suggested by Cheung.<sup>4</sup> This was

**Table 2:** Pain of mammography rated by subjects

Level of pain	Number of women (n=183)
0 (no pain)	6
1	64
2	53
3	33
4	19
5 (worst pain)	8

**Table 3:** Indications and outcomes of further evaluation

Indications for recall	Outcomes of further evaluation		
	No abnormalities found	Abnormalities found	FNA done
Breast asymmetries (n=13)	11	2	2
Mass (n=11)	4	7	4
Breast asymmetries and mass (n=1)	1	0	0
Skin changes (n=1)	0	1	1
Axillary mass (n=1)	1	0	0

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## Key messages

1. Breast cancer is the second most common cause of cancer death in Hong Kong.
2. Overseas studies have shown that mammography screening could reduce breast cancer mortality by 30% for women  $\geq 50$  years old.
3. Breasts of Chinese women  $\geq 45$  years old are suitable for screening mammography.
4. The uptake rate of screening of 37% is too low for any beneficial effect on breast cancer mortality.
5. The possible benefit of screening mammography has to be balanced against the resources and psychological stress of false positive result.

different from the finding of a local study in 1985 that the breasts of Chinese women were too small for mammography.<sup>17</sup> The quality of the mammography equipment has improved since 1985. Furthermore, the women were much younger (median age 46 years old) and the mammographies were done for diagnosis rather than screening in this early study.<sup>17</sup>

The retake rate was slightly higher than the international standard of less than 5%.<sup>19,25</sup> This may improve with more experience. More than 10% women required additional films. Patients should be informed before the test of the possibility of additional films or retakes and be reassured that the amount of radiation from modern mammography machines is quite negligible<sup>26</sup> to avoid unnecessary anxiety.

Fifteen percent, that is, one in six of the women required further evaluation. Fortunately or unfortunately, none had breast cancer. Our recall rate was twice that of some other screening programmes.<sup>10,18,27</sup> We took the more conservative approach of recalling all women with breast asymmetry for further evaluation because the lack of local data on its

significance. It turned out that most breast asymmetries did not have any abnormality on further evaluation. The threshold for recall is a trade-off between false positives and false negatives.<sup>28</sup> Recalls for further evaluation could be very stressful for patients who may be particularly frustrated by false positive results.<sup>28-30</sup> Cockburn *et al* showed that women recalled for further evaluation showed significantly more emotional and physical dysfunction, which were still present one week after they were told of their normal results.<sup>30</sup> More local experience in mammography may improve the predictive accuracy and reduce the recall rate. However, false positive recall is an inevitable part of any screening programme and is always more common than true positives.<sup>28</sup> General practitioners must be aware of this and be prepared to counsel patients before and after their further evaluation.

The FNA rate in our study was 4% which was comparable to those of other programmes.<sup>10,18,27</sup> It was not surprising that we did not detect any breast cancer in the 183 women screened. The expected cancer detection rate is 5-8/1000 in western populations<sup>10,18,27</sup> and it may even be lower locally.<sup>4</sup>

## Conclusions

We found that mammography screening for patients presenting to general practice was technically feasible and breasts of our women were suitable for mammography. Most women found the experience of mammography acceptable. Our FNA rate was comparable to those of screening programmes in other countries but there is room for improvement in our screening uptake, retake and recall rates.

We now have more information about mammography for our female patients in general practice. We can reassure them that most women only experience mild pain from the test and the chance of finding a cancer is quite low. On the other hand, we need to prepare them psychologically for a one in five chance of additional films or retakes, one in six chance of recall for further evaluation and one in 26 chance of having a fine needle aspiration. All these will have to be weighed against the possible benefit of mammography screening.

The very low uptake rate of screening shows that most of our women in general practice are not willing to have mammography screening. We are unlikely to have

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any significant reduction in our breast cancer mortality if only 37% of the target population were willing to be screened. A more cost-effective approach may be to target women in the high risk group e.g. previous breast cancer or positive family history, who may be more aware of the problem and thus more motivated to screening. More public education to raise the general awareness of breast cancer and mammography may also help to improve the uptake rate of screening.

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## References

1. Lee SH. *Department of health annual report 1992/93*. Hong Kong: Government Printer, 1994: 37-62.
2. Hospital Authority, *Hong Kong Cancer Registry Annual Report 1991*. Hong Kong. p.19.
3. Feuer EJ, Wun LM, Boring CC, Flanders WD, Timmel MJ, Tong T. The lifetime risk of developing breast cancer. *J Natl Cancer Inst* 1993; 85: 892-897.
4. Cheung PSY. Breast cancer in Hong Kong – the need for early detection. *J HKMA* 1992; 44: 248-252.
5. Sainsbury JRC, Anderson TJ, Morgan DAL, Dixon JM. Breast cancer. *BMJ* 1994; 309: 1150-1153.
6. Cooke TG. Ductal carcinoma in situ: a new clinical problem. *Br J Surg* 1989; 76: 660-662.
7. Tabar L, Fagerberg CJG, Gad A, et al. Reduction in mortality from breast cancer after mass screening with mammography. *Lancet* 1985; 1: 829-832.
8. Seidman H, Gelb SK, Silverberg E, LaVerda N, Lubera JA. Survival experience in the breast cancer detection demonstration project. *Ca* 1987; 37: 258-290.
9. Anderson TJ, Lamb J, Donnan P, et al. Comparative pathology of breast cancer in a randomised trial of screening. *Br J Cancer* 1991; 64: 108-113.
10. Wald NJ, Chamberlain J, Hackshaw A. Report of the European Society for Mastology Breast Cancer Screening Evaluation Committee (1993) – Consensus Statement. *Breast* 1993; 2: 209-216.
11. Shapiro S, Venet W, Strax P, Venet L, Roeser R. Ten – to fourteen – year effect of screening on breast cancer mortality. *J Natl Cancer Inst* 1982; 69: 349-355.
12. Kerlikowske K, Grady D, Rubin SM, Sandrock C, Ernster VL. Efficacy of screening mammography – a meta-analysis. *JAMA* 1995; 273: 149-154.
13. Nystrom L, Rutqvist LE, Wall S, et al. Breast cancer screening with mammography: overview of Swedish randomised trials. *Lancet* 1993; 341: 973-978.
14. US preventive services task force. *Am Fam Physician* 1989; 39: 89-96.
15. Canadian task force on the periodic health examination. The periodic health examination: 2. 1985 update. *Can Med Ass J* 1986; 134: 724-727.
16. Austoker J. Breast cancer screening. London: *Meditext*, 1992.
17. Alagaratnam TT, Wong J. Limitations of mammography in Chinese females. *Clin Radiol* 1985; 36: 175-177.
18. Chamberlain J, Moss SM, Kirkpatrick AE, Michell M, Johns L. National health service breast screening programme results for 1991-2. *BMJ* 1993; 307: 353-356.
19. Roebuck EJ. Clinical radiology of the breasts. Oxford: *Heinemann Medical Books*. 1990. Ch. 10.
20. Yuan JM, Yu MC, Ross RK, Gao YT, Henderson BE. Risk factors for breast cancer in Chinese women in Shanghai. *Cancer Res* 1988; 48: 1949-1953.
21. Tao SC, Yu MC, Ross RK, Xiu KW. Risk factors for breast cancer in Chinese women of Beijing. *Int J Cancer* 1988; 42: 495-498.
22. Norusis MJ. *SPSS/PC+ for the IBM PC/XT/AT*. Chicago: *SPSS Inc*. 1986.
23. General Registrar Office. Register General's classification of occupation. *HMSO*. London, 1966.
24. Census and statistics department, Hong Kong. Hong Kong 1991 population census main report. Hong Kong: *Government Printer* p.69-96.
25. Peeters PHM, Verbeek ALM, Hendriks JHCL, Van Bon MJH. Screening for breast cancer in Nijmegen. Report of 6 screening rounds, 1975-1986. *Int J Cancer* 1989; 43: 226-230.
26. Feig SA. Radiation risk from mammography: is it clinically significant? *AJR* 1984; 143: 469-475.
27. Cardenosa G, Eklund GW. Rate of compliance with recommendations for additional mammographic views and biopsies. *Radiology* 1991; 181: 359-361.
28. Harris R, Leininger L. Clinical strategies for breast cancer screening: weighing and using the evidence. *Ann Int Med* 1995; 122: 539-547.
29. Lerman C, Trock B, Rimer BK, Boyce A, Jepson C, Engstrom PF. Psychological and behavioural implications of abnormal mammograms. *Ann Int Med* 1991; 114: 657-661.
30. Cockburn J, Staples M, Hurley SF, De Luise T. Psychological consequences of screening mammography. *J Med Scr* 1994; 1: 7-12.