

Double Independent Reading at Screening Mammography with Arbitration at the University Hospital of the West Indies: The initial experience

P Johnson, M James, D Mitchell, D Soares

Citation

P Johnson, M James, D Mitchell, D Soares. *Double Independent Reading at Screening Mammography with Arbitration at the University Hospital of the West Indies: The initial experience*. The Internet Journal of Radiology. 2009 Volume 12 Number 1.

Abstract

Aim: To evaluate the initial experience with the first double independent reading at screening mammography in Jamaica
Method: This was a retrospective review of all patients presenting to the Breast Imaging Unit for Screening Mammography at the University Hospital of the West Indies from October 2006 to April 2007
Results: A total of 368 women were screened. Of these, 101 were undergoing their first screening mammogram. 77 had done one previous mammogram. 190 women had done more than 2 mammograms. The age of the women screened ranged from 36 to 90 years of age. The mean age was 55 years. 36 women were considered abnormal. 36 women were considered abnormal. Suspicious microcalcification was the most common abnormality reported. No malignancies were confirmed at histopathological evaluation.
Conclusion: The recall rate in our study was very low. No cancers were detected. This is likely due to the small sample size. Detection rates are not likely to improve unless more eligible women participate in breast cancer screening in Jamaica.

INTRODUCTION

Breast cancer is a leading cause of death and morbidity amongst Jamaican women¹. Mammographic screening has been shown to reduce mortality rates from breast cancer in women over 40². Screening can only be effective if the at-risk population avail themselves of the facility. Recent data suggests that less than 5% of Jamaican women eligible for mammographic screening actually have mammograms³.

Mammography services are available at the public sector facilities of the University Hospital of the West Indies, as well as the St. Ann's Bay Hospital. There are also at least seven private centres across the island that also offers the service and one non-governmental organization the Jamaica Cancer Society.

The University Hospital of the West Indies (UHWI) is affiliated academically with the University of the West Indies. Screening mammography at UHWI began in 1997 when the breast-imaging unit was initially installed.

Although a regional [this is unclear, regional may seem to mean a region of Jamaica rather than the Caribbean Region] facility, the majority of its clients come from the eastern parishes of Kingston and St. Andrew with a combined

female population aged 40 years and over of just over 95,000⁴

Initially at UHWI, due to staffing constraints, a single radiologist read all mammograms individually. In October 2006, a double independent system of reading mammograms was implemented. This involved:

1. Two radiologists are assigned to screening cases each week
2. These radiologists individually read each screening study independent of each other, at different times
3. Each film is second read after the first reader
4. The second reader is blinded
5. All screening cases for the week are brought to an arbitration meeting at the beginning of the following week.
6. At arbitration:
 - a. Cases reported normal by both readers go for typing

- b. Where cases reported abnormal by both readers the decision as to what should be done at recall is made by all three radiologists
- c. In cases where there is disagreement in the findings (i.e. reported normal by one reader and abnormal by the other), the final decision is made by the arbitrator.

Patients considered suitable for screening must be:

1. Forty years and older
2. Asymptomatic

These women may be referred by their primary care physician or other medical doctor, or may be self referred.

All patients in whom it is determined that tissue sampling is required, are referred to the General Surgery service for clinical evaluation and follow-up of the histology results.

At present, no similar breast screening system exists in Jamaica. Given the separation of patients into screening and symptomatic populations, an unprecedented opportunity now exists for the evaluation of true screening mammography in terms of:

1. Actual number of patients presenting for true screening (i.e. asymptomatic patients in the screening age)
2. True positives
3. False positives

The aim of this study is to evaluate the initial experience with this new system. Such an early evaluation is important to determine the impact, if any on our delivery of care and to identify any shortfalls.

METHOD

This was a retrospective review of all patients presenting to the Breast Imaging Unit for Screening Mammography at the University Hospital of the West Indies from October 2006 to April 2007. Demographic data for the women screened as well as cancer detection rates were sought. Ethical approval for this study was obtained from the local ethical board.

Only women presenting for screening mammography were included. This means women 40 years and older with no self or clinically detected breast symptom who were either self-referred or clinically referred for screening mammography. Women under 40 and all women with symptomatic breast complaints were excluded.

A manual search of the patient log kept in the Breast Imaging Unit was used to locate the radiologic and pathologic reports.

All women who presented for screening were included.

A database was created using FileMaker 8.5 to log the data. The following data was logged:

- Patient age
- Date of screening mammogram
- Dates of first and second reading
- Date of Arbitration
- Arbitration results
- Dates and results of tissue sampling if performed

RESULTS

The collection of data spanned the six-month period between October 2006 and April 2007. A total of 368 women were screened. Of these, 101 were undergoing their first screening mammogram. This represents the prevalent round. 77 had done one previous mammogram. 190 women had done more than 2 mammograms. This gave a total of 267 women having repeat screening mammograms. This represents the incident round.

The age of the women screened ranged from 36 to 90 years of age. The mean age was 55 years.

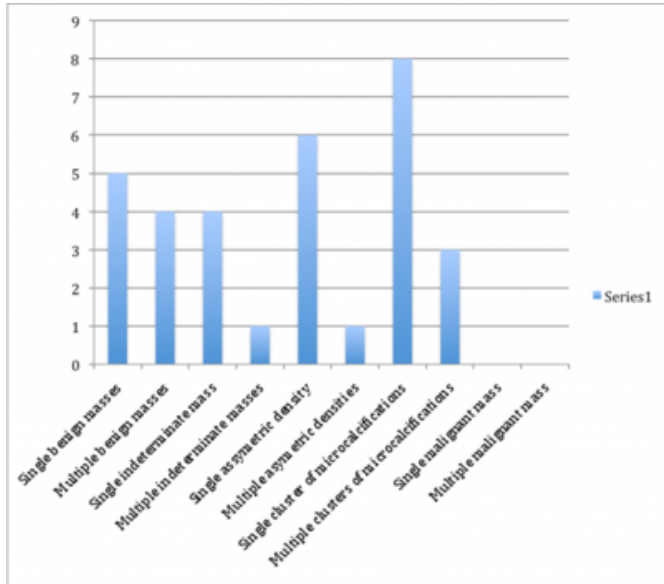
Of the 368 women screened, 332 were considered normal at final arbitration and recommended to continue annual screening. There was inter-observer agreement of normal findings between the first and second readers at initial reading in 253 women. Of the other 79, the final decision of a normal mammogram was made at arbitration.

36 women were considered abnormal at final arbitration. Four of these women did not complete their work-up in terms of additional views and/or other investigations.

Suspicious microcalcification was the most common abnormality reported. This and other abnormalities reported are illustrated in figure 1.

Figure 1

Figure 1.



More lesions were found in the right breast (18) than the left (19). In 5 patients, lesions were found in both breasts.

No lesion was thought to demonstrate mammographic features of invasive carcinoma however, suspicious microcalcifications were found in 12 cases.

Of the 32 cases, 6 cases were determined to be normal after further views and/or ultrasound and were returned to the incident round.

Fourteen patients were referred for hook-wire localization excision biopsy (HWL). Suspicious microcalcifications was the most common indication for HWL as outlined in table 1.

Figure 2

Table 1.

Indication	Number of patients
Suspicious microcalcifications	11
Persistent asymmetric density	1
Mammographic "mass" not seen at sonography	2

Only eight patients of the fourteen actually underwent HWL. The reasons for this were unclear as no documentation was found.

Of the eight patients who did undergo HWL, pathology

results were found for 5 patients. The pathology reports for these 5 patients revealed benign results.

Twenty-eight (28) patients were referred for breast sonography based on mammographic findings. One patient did not return for sonography. No reason for this was found. Four patients who had negative findings at sonography were referred for HWL, and are included in the numbers above. Positive findings were found in 10 patients at sonography. Three were simple cysts. Two lesions were determined to be benign intra-mammary lymph nodes. Five lesions underwent core biopsy. Histopathology confirmed these lesions to be benign.

No malignancy was diagnosed in this sample of patients.

DISCUSSION

In the six-month period, 368 patients were screened. This represents significantly less than 1% of the 95,484 women over the age of 40 residing in Kingston & St. Andrew⁴. Assuming that twice this number might have been screened in one year, this would still represent less than 1%. One study has suggested that less than 5% of Jamaican women eligible for mammographic screening actually have mammograms³. This is significantly lower than the acceptance rate (73%-74%) by women of screening age in the National Health Service's Breast Screening Programme (NHSBSP)⁵. These findings suggest that screening mammography has not made a significant impact on the population as a whole in Jamaica.

Regarding the patients who were screened, the recall rate was 0.1%. This is surprisingly less than the average recall rate in the NHSBSP (4%-4.5)⁵. This very low recall rate may be due to three factors. Firstly, it may represent overtly confident mammographic interpretation by the readers. If this were the case, this would be of concern as no radiologist involved read volumes of studies that are typical of large screening programs. The second possibility is that the radiologists involved are not sufficiently experienced at recognizing the more subtle features of early breast cancer. This would represent a possibly high false negative rate. The third possibility is that the sample size is too small and therefore not representative of the screening population. The last possibility is that breast cancer in the Jamaican population is aggressive and therefore presents in the symptomatic population. It is possible that a combination of the latter three reasons is the case. Unless expert readers from larger centres reviewed the films involved in this study,

this issue may not be resolved.

Tissue sampling was done on thirteen of the 36 patients recalled. No malignant lesion was found. In 2007-2008, just under 1.9 million women were screened in the NHSBSP this represented approximately 73% of the screening population at that time. 16449 cancers were detected⁵. This represents a detection rate of approximately 0.9%. The non-detection of cancer in our study may represent a too small sample size. The University hospital screens less than 1% of women eligible for screening in Jamaica.

The literature demonstrates somewhat conflicting data regarding the efficacy of double independent reading. There have been several studies which have demonstrated improved sensitivity (5-15%) and accuracy of double independent reading compared to single reading in screening mammography^{6,7,8-10}. It may also reduce the recalls resulting in false positive results¹¹. Some studies refute this¹² and argue that it is not cost effective¹³. However, given the small numbers of patients screened and the relative lack of experience of our radiologists in screening mammography, it could be argued that double independent reading should be beneficial. It is difficult in our setting to compare this to a single reader system in our institution because a formal breast screening system was not in place prior to this.

This study sought to evaluate the initial experience with the first double independent reading at screening mammography in Jamaica. Unfortunately no data exists to our knowledge of cancer detection rates from screening mammography in Jamaica. No institution offering mammography sought to separate the screening and symptomatic populations. At the University Hospital, records in the mammography unit were stored in a non-digital format and did not routinely contain patient historical data. It is therefore difficult to determine which cancer was detected by screening mammography, and which was detected clinically. It is therefore not possible at this time to compare single reader systems with the

introduced double reader system in our institution.

The results of this initial review demonstrate low recall and cancer detection rates. This is likely due to the small sample size. Detection rates are not likely to improve unless more eligible women participate in breast cancer screening in Jamaica. A review of the data in the future should give a better picture of this new system.

References

1. Hanchard, B. et al. Age-specific incidence of cancer in Kingston and St Andrew, Jamaica, 1993-1997. *West Indian Med J* 50, 123-129 (2001).
2. Smith, R. A. et al. American Cancer Society guidelines for breast cancer screening: update 2003. *CA Cancer J Clin* 53, 141-169 (2003).
3. Soares, D., Kirlaw, K., Johnson, P. & Reid, M. Mammographic referral patterns for two breast imaging units in Jamaica. *West Indian Med J* 56, 159-162 (2007).
4. Population Census of Jamaica 2001 Age and Sex (The Statistical Institute of Jamaica, 2003).
5. NHS Breast Screening Programme Annual Review 2009 (NHS Breast Screening Programme, 2009).
6. Anderson, E. D., Muir, B. B., Walsh, J. S. & Kirkpatrick, A. E. The efficacy of double reading mammograms in breast screening. *Clin Radiol* 49, 248-251 (1994).
7. Thurffjell, E. L., Lernevall, K. A. & Taube, A. A. Benefit of independent double reading in a population-based mammography screening program. *Radiology* 191, 241-244 (1994).
8. Ciatto, S. et al. The role of arbitration of discordant reports at double reading of screening mammograms. *J Med Screen* 12, 125-127 (2005).
9. Harvey, S. C. et al. Increase in cancer detection and recall rates with independent double interpretation of screening mammography. *AJR Am J Roentgenol* 180, 1461-1467 (2003).
10. Hofvind, S., Geller, B. M., Rosenberg, R. D. & Skaane, P. Screening-detected breast cancers: discordant independent double reading in a population-based screening program. *Radiology* 253, 652-660 (2009).
11. Shaw, C. M., Flanagan, F. L., Fenlon, H. M. & McNicholas, M. M. Consensus review of discordant findings maximizes cancer detection rate in double-reader screening mammography: Irish National Breast Screening Program experience. *Radiology* 250, 354-362 (2009).
12. Taplin, S. H. et al. Accuracy of screening mammography using single versus independent double interpretation. *AJR Am J Roentgenol* 174, 1257-1262 (2000).
13. Ciatto, S. et al. Independent double reading of screening mammograms. *J Med Screen* 2, 99-101 (1995).

Author Information

Peter Johnson

Department of Surgery, Radiology, Anaesthetics & Intensive Care, Faculty of Medical Sciences, University of the West Indies

Michael James

Department of Surgery, Radiology, Anaesthetics & Intensive Care, Faculty of Medical Sciences, University of the West Indies

Derek Mitchell

Department of Surgery, Radiology, Anaesthetics & Intensive Care, Faculty of Medical Sciences, University of the West Indies

Deane Soares

Department of Surgery, Radiology, Anaesthetics & Intensive Care, Faculty of Medical Sciences, University of the West Indies