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Detecting breast cancer in a general practice

Like finding needles in a haystack?

Background

Breast cancer contributes the largest burden of cancer related disease in Australian women. Early detection is an important part of the general practitioner's work, with clinical audit recommended to help improve the quality of such work.

Methods

A clinical database was analysed for newly diagnosed breast cancer patients of one GP for the years 1986–2006.

Results

Thirty new cases of breast cancer were diagnosed, with 87% in the 'early' stages. Fifty-seven percent were outside the target age of 50–69 years used by BreastScreen to recruit women for screening. Apparent false-negative investigations occurred in 33% of cases. The mean time interval between women noting symptoms and consulting the GP was 84 days and the mean time interval from first presentation to final diagnosis was 54 days.

Discussion

The diagnosis of breast cancer in this series was relatively infrequent, and prior apparent false-negative investigations were not uncommon. As many women diagnosed were outside the usual mammography screening age range of 50–69 years, there is a need for constant awareness of the possibility of breast cancer in all female patients. Encouraging women to present early with breast symptoms and adherence to the 'triple test' recommendation of clinical breast examination, imaging and biopsy for women with breast symptoms is important to minimise the risk of diagnostic delay.

■ **During the period of this case series from 1986–2006, breast cancer contributed the largest burden of cancer related disease in Australian women.¹ The early detection of such cancers is an important part of the work of the general practitioner,² bringing the hope to women of less aggressive treatment needed, and improved survival.³**

Despite the significance of breast cancer diagnosis in this setting, a review of the literature found only one long term case series reported from a family practice in rural New York State for the years 1974–1994.⁴

This study, from the regional city of Coffs Harbour, New South Wales, examines data over a 20 year period relating to the diagnosis of breast cancer among the female patients of one GP. The doctor mostly worked eight half day sessions per week, with data from the middle year of the series suggesting that the number of services rendered, and the percentage of female patients, were close to the national average for all GPs.⁵ The study follows national recommendations for the use of clinical audit as a quality improvement tool.⁶

Methods

During 1991, a data sheet was developed and used on an ongoing basis to examine the circumstances of each diagnosis of breast cancer in this practice from its beginning in 1986. During the first 8 years of this series, as well as diagnostic studies for all women, screening studies (mammography and ultrasound) were available for women with a close family history of breast cancer.⁷ All women aged 40 years and over who were regular patients of this practice were encouraged to have an annual clinical breast examination (CBE) with this doctor.⁸

In 1995, the national BreastScreen Program began in Coffs Harbour; and all women from this practice in the target age group of 50–69 years were strongly encouraged to attend. On the basis of new guidelines, routine annual CBE ceased for all women in this practice in 1997,⁹ and time 'saved' was shifted to other important conditions such as

cardiovascular disease, diabetes and mental health.

The following case series includes all women who were regular patients of the practice, and whose GP consultation leading to the diagnosis of breast cancer occurred within the 20 years from November 1986. The one patient diagnosed through the BreastScreen pathway is also included, together with those women who were not regular patients of the practice, but who presented to the practice with symptoms that proved to be breast cancer.

Results

Frequency, age, method of diagnosis and stage

During the 20 years of the study there were 30 new cases of breast cancer in 29 women. The number of cases diagnosed per year ranged from zero (six occasions) to four (one occasion). The mean time interval between diagnoses was 243 days (SD: 277; median 118), with a wide

range of 7–1195 days. At the time of diagnosis, the mean age was 63 years (SD: 14; median 65, range 34–88). In 17 cases (57%) the ages were outside the range used by BreastScreen in recruiting women for screening, with seven cases (23%) occurring in premenopausal women.

Open biopsy was the method of diagnosis in 50% of cases, followed by fine needle aspiration biopsy (FNAB) in 27%, and core biopsy in 17%. On two occasions (7%), clinical diagnosis alone was used due to the frailty of the patients. The clinical stage at diagnosis is shown in *Table 1*. If early breast cancer is defined as stages 0–II inclusive, then 87% of cases in this series fall into this 'early' group.

How the diagnostic process was initiated

Table 2 demonstrates the way in which the diagnosis of breast cancer was initiated: during a clinical encounter, by telephone, or by BreastScreen. As the diagnosis of breast cancer in this series occurred overwhelmingly in the general practice context, it is important to examine the time interval from the initial GP consultation to the date of definite diagnosis of the cancer. Among the 29 cases in which this was the pathway to diagnosis, the mean interval was 54 days (SD: 83; median 20, range 0–393).

But what of the time interval before the involvement of the GP in which the women had experienced then reported breast symptoms? There were 12 such cases that triggered the diagnostic process. Among these women, the mean stated time interval from becoming aware of symptoms to reporting them to the GP was 84 days (SD: 105; median 55, range 1–365).

Table 1. Clinical stage at diagnosis (n=30)

Clinical stage	Number of cases	%	Cumulative %
0	8	27	27
I	12	40	67
II	6	20	87
III	2	7	93
IV	2	7	100
Total	30		
% rounded			

Table 2. Ways in which the diagnosis of breast cancer was initiated (n=30)

How the topic was raised	Number of patients in subgroup	Number of patients overall
During clinical encounter		
• Patient described breast symptom:		11
– lump	7	
– pain	1	
– itch	1	
– nipple discharge	1	
– dimple	1	
• Doctor offered CBE		8
• Patient requested mammogram		3
• Doctor offered mammogram		2
• Daughter described mother's breast symptom (nipple eczema)		1
By telephone		
• Nurse felt breast lump while showering patient		1
• Daughter saw mother's breast lump		1
• Husband saw wife's breast lump		1
• Patient felt lump and requested imaging		1
By BreastScreen Program		
• Routine recall for mammogram		1
Total		30

Of the 30 cases, there were 14 in which the woman was known to have had a prior mammogram. The mean prior time was 17 months (SD: 11; median 15, range 2–38). Of the other 16 cases, 11 had never had a mammogram (but had not refused one), two had refused, and data for three were unavailable. Of the 11 'nevers', eight were outside the BreastScreen target age range; three being less than 50 years of age and five being more than 69 years.

Apparent false-negative investigations

Table 3 shows those interventions where a false-negative result occurred, or appeared to have occurred, and created delay during the diagnostic pathway. The word 'apparent' is chosen as it was not always certain that the breast cancer was present at the time of the test.

There were 10 cases (33% of total) containing 21 apparent false-negative tests. Of these, one occurred in the surgical, two in the general practice, and 18 (86%) in the radiology discipline. In eight of these cases there was one false-negative per case, in one case there were two, and in one case there were eight apparent false-negatives, including four mammograms. Among the 10 cases, seven had very early (stage 0 or I) breast cancer diagnosed.

Discussion

Data for breast cancer incidence in New South Wales women over the period of this case series show little year-to-year variability.¹⁰ However, at the level of the individual practice, the present study shows very marked year-to-year variability. Such an erratic pattern demands a steady vigilance from the individual GP for the possibility of an undiagnosed breast cancer among female patients.

Marked variability is also a key feature of the data relating to age at diagnosis of breast cancer, with a range of 54 years in this series. While a GP is now assisted by the national BreastScreen Program in

early cancer detection, the large proportion of cases (57% in this series) falling outside the program's recruiting target age range shows that there is also a need for steady vigilance of all women patients.

The 87% 'early' detection rate for breast cancers diagnosed in this series compares favourably with the 78% rate in the New York study.⁴ A breast cancer series from a general surgical practice in rural Victoria from 1992–1995 had a 71% 'early' detection rate.¹¹ However, these rates show no significant statistical differences.

For this series, the median time interval of 20 days from the first GP consultation to the date of definite breast cancer diagnosis seems satisfactory, and reflects a team effort. A Devon study from 1986–1990 found a 29 day median interval from first GP presentation to start of treatment.¹² Data provided there suggest that the median time interval to definite diagnosis was similar to the Coffs Harbour series. In the Devon study there was a large range of 0–3759 days for the first GP presentation to start of treatment interval. This shows that in a small proportion of cases, symptoms and/or signs may, because of their subtlety, be present for a long period before diagnosis.

A large survey of National Health Service (NHS) patients in England was undertaken among women discharged from hospital during the 12 months from July 1999.¹³ Of six major cancers, diagnostic delay among patients presenting from their GP was shortest for breast cancer, with a median of 31 days, and a mean of 63 (SD: 259) days. It is likely that the time interval was longer than in the Devon and Coffs Harbour series in part because the NHS survey used the date when each patient first noticed symptoms or signs of the condition as the starting point of the interval.

In a case series from 1992–1999, based in a Californian surgical practice specialising in breast disease, delay was considered to have occurred in 9% of the 454 cases of breast cancer reported.¹⁴ Delay occurred in 11% of cancers diagnosed before referral, and 8% of

Table 3. Apparent false-negative investigations, by modality, clinical discipline, and clinical stage at diagnosis (n=21)

Modality (total)	Clinical discipline	Case series number	No. of apparent false-negative investigations	Clinical stage at diagnosis
Clinical breast examination (3)	Surgeon	7	1	0
	GP	27	2	I/A
Mammogram (9)	Radiologist	11	1	I
	Radiologist	19	1	I/A
	Radiologist	24	3	IV
	Radiologist	27	4	I/A
	Radiologist	27	4	I/A
Ultrasound (4)	Radiologist	19	1	I/A
	Radiologist	21	1	I
	Radiologist	27	2	I/A
Fine needle aspiration biopsy (4)	Radiologist	12	2	I
	Radiologist	16	1	0
	Radiologist	23	1	0
Core biopsy (1)	Radiologist	30	1	0
Total			21	

those diagnosed after referral, a difference which was not statistically significant. The leading cause of physician delay in breast cancer diagnosis stemmed from false-negative CBE. Several authors describe a need to improve the sensitivity of CBE, and ways in which this might occur.^{15–17} Goodson and Moore¹⁶ define categories of breast hardness and nodularity, with the highest risk of delay for tissue, which is less hard and more nodular.

The Australian National Breast Cancer Centre (NBCC) recommends the 'triple test' for women with breast symptoms.¹⁸ As well as CBE, this includes imaging (mammography and ultrasound) and nonexcision biopsy (FNAB and core biopsy). Mammography is a powerful weapon in the early detection of breast cancer. In 1996 for example, 'program sensitivity' for BreastScreen New South Wales was 86.4%.¹⁹ However this means that in that year, for all women screened who had breast cancer diagnosed, 13.6% of these cases were detected by methods other than screening. In the Coffs Harbour series there were two cases in which CBE subsequent to negative screening mammography revealed very obvious cancer-like lesions.

Ultrasound was commonly used in the investigation of breast symptoms and signs in the Coffs Harbour series but, despite its diagnostic value, there were four false-negatives recorded. The NBCC guide shows that nonexcision biopsy is highly sensitive and specific. However, the risk of false-negatives remains, and appeared to occur on four occasions for FNAB and once for core biopsy in this series.

The appropriate application of the 'triple test' adds greatly to the accuracy with which breast cancer is diagnosed. Any element of the 'triple test' that is suspicious should lead to further review or investigation. The NBCC guide also promotes 'breast awareness' for women, so that each woman is able to monitor and report to her doctor changes in her breasts which could be suspicious for cancer.

In the New York and Coffs Harbour series, a small proportion of women refused offers from their doctors to participate in CBE and mammography screening. For one of the Coffs Harbour women, diagnosis was made only after intervention by the daughter. The patient had been aware of the lump for some 10 years, a large ulcerated mass by the time help was requested from the GP.

Various expert guidelines may offer conflicting advice to GPs regarding aspects of the management of serious conditions such as breast cancer.²⁰ As a result, each GP is required to choose the advice which seems appropriate to the practice concerned. The decision to cease routine annual CBE in this practice in 1997 appeared appropriate at the end of the series.

Conclusion

Despite the introduction of the BreastScreen Program during the middle years of this case series, breast cancer among the patients of this practice continued to be diagnosed overwhelmingly via the GP rather than the screening pathway. Because such diagnosis was relatively infrequent, at irregular intervals, and in an age range much wider than that targeted by BreastScreen, there was a need for a constant awareness of the possibility of breast cancer in all female patients of

the practice. The same need was emphasised because apparent false-negative prior investigations were not uncommon. Encouraging women to present early with breast symptoms and adherence to the 'triple test' recommendation of CBE, imaging and biopsy for women with breast symptoms is important to minimise the risk of diagnostic delay. Such an approach is likely to make the process of diagnosing breast cancer early more effective, and far less like 'finding needles in a haystack'.

Conflict of interest: none declared.

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