

Completeness of reporting on prognostic factors for breast cancer: a regional survey

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Abstract

Background—Effective management of breast cancer is dependent on adequate pathological reporting of the surgical specimen.

Objective—To describe the frequency with which histopathological features of known prognostic importance are routinely recorded.

Study population—885 cases of invasive breast cancer diagnosed in NHS laboratories in Lancashire and Greater Manchester.

Methods—Pathology reports were reviewed for details of tumour histological type, size, and grade, the presence or absence of tumour in blood or lymphatic vascular channels, and a comment on the proximity of tumour to the lines of surgical excision. Laboratories were categorised according to their throughput of cases of breast cancer, involvement in the breast screening programme, and whether they were attached to a teaching hospital.

Results—Histological type, tumour size, presence or absence of tumour in vascular channels, and adequacy of excision were recorded for 843 (95%), 803 (91%), 436 (49%), and 761 (86%) cases, respectively. Non-screening and low throughput laboratories were significantly less likely to record certain histopathological features. No significant differences were observed between teaching and non-teaching hospitals.

Conclusions—The substantial interlaboratory variation in the histopathological reporting of breast cancers can, in part, be related to throughput of cases and involvement in the breast screening programme.

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Keywords: breast cancer; audit; prognostic factors

Effective management of patients with breast cancer depends heavily on the quality of pathology reporting.^{1,2} We investigated how frequently certain histopathological features of known prognostic importance were recorded for women undergoing surgery for invasive primary breast cancer in Greater Manchester and Lancashire.

Methods

All new cases of primary invasive breast cancer diagnosed between 1 January and 30 June 1993 were identified from records held by the North

Western Regional Cancer Registry, supplemented by a trawl of all 20 NHS pathology laboratories in Greater Manchester and Lancashire. Cases were excluded from further analysis when either no pathology report was available or the only material provided for assessment was a trucut biopsy or a fine needle aspirate. For each remaining case, pathology reports were reviewed for details of tumour type, size, and grade, the presence or absence of tumour in blood or lymphatic vascular channels, and comments on the proximity of tumour to the lines of surgical excision. When the pathologist explicitly stated that it was not possible to assess a specific histological feature, this was considered a positive comment.

Laboratories were grouped into those within teaching (n = 5) and non-teaching hospitals (n = 15); those involved in the NHS breast screening programme (n = 7) and non-screening laboratories (n = 13); and low (< 32 cases; n = 6), medium (33-51 cases; n = 7), and high throughput (> 51 cases; n = 7) laboratories. The χ^2 test with Yates' correction was used when two groups were being compared. A test for trend in proportions assuming equal intervals between the groups was used to investigate the significance of reporting differences between low, medium, and high throughput laboratories.³

Results

The mean age of the 885 cases eligible for analysis was 60 years (range 20-94). Details of tumour histology are shown in table 1. Tumour size, presence or absence of tumour in blood or lymphatic vascular channels, and adequacy of excision were recorded for 803 (91%), 436 (49%), and 761 (86%) cases, respectively. A comment on tumour grade was recorded for 587 (89%) of the 657 cases of ductal carcinoma. Histological type was reported for 843 (95%) cases but as 31 of the remaining 42 untyped cases were assessed by only two laboratories, this prognostic factor has been omitted from the following comparisons.

COMPARISON OF SCREENING AND NON-SCREENING LABORATORIES

Three hundred and ninety three (44%) cases were assessed in screening and 492 (56%) in non-screening laboratories. Screening laboratories were significantly more likely than non-screening laboratories to record a comment on tumour size ($\chi^2 = 12.1$; df = 1; p = 0.0005), the presence or absence of tumour in vascular channels ($\chi^2 = 5.2$; df = 1; p = 0.02), the adequacy of lines of surgical

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Table 1 Details of tumour histopathology

	Number of cases (%)
<i>Histological type (n = 885)</i>	
Ductal carcinoma	657 (74.2)
Lobular carcinoma	85 (9.6)
Tubular carcinoma	22 (2.5)
Mucoid carcinoma	22 (2.5)
Medullary carcinoma	7 (<1)
Cribiform carcinoma	6 (<1)
Mixed invasive	34 (3.8)
Other invasive types	10 (1.1)
Carcinoma/adenocarcinoma not otherwise specified	42 (4.8)
<i>Size (n = 885)</i>	
< 2 cm	462 (52.2)
2-5 cm	289 (32.7)
> 5 cm	48 (5.4)
Not evaluable	4 (<1)
Not recorded	82 (9.3)
<i>Grade (n = 657)*</i>	
I	92 (14.0)
II	274 (41.7)
III	219 (33.3)
Undifferentiated	1 (<1)
Not evaluable	1 (<1)
Not recorded	70 (10.7)

* Women with invasive ductal carcinoma only.

excision ($\chi^2 = 9.2$; $df = 1$; $p = 0.024$), and tumour grade ($\chi^2 = 33.2$; $df = 1$; $p < 0.0001$) (table 2).

COMPARISON OF HIGH, MEDIUM, AND LOW THROUGHPUT LABORATORIES

Four hundred and sixty seven (53%) cases were assessed in high throughput laboratories, 277 (31%) in medium, and 141 (16%) in low. Low throughput laboratories were significantly less likely than high and medium ones to record a comment on the presence or absence of tumour in vascular channels ($\chi^2 = 28.0$; $df = 1$; $p < 0.0001$), adequacy of excision ($\chi^2 = 16.0$; $df = 1$; $p < 0.0001$), and tumour grade ($\chi^2 = 22.2$; $df = 1$; $p < 0.0001$), but not tumour size ($\chi^2 = 0.035$; $df = 1$; $p = 0.85$) (table 2).

Table 2 Comparison of reporting of histopathological features between teaching and non-teaching, screening and non-screening, and low, medium, and high throughput laboratories

	Teaching		Screening programme		Throughput		
	Yes	No	Yes	No	Low	Medium	High
Number of laboratories	5	15	7	13	6	7	7
Number of cases	207	678	393	492	141	277	467
Interlaboratory range	13-79	15-75	31-79	13-69	13-31	33-51	57-79
Number (%) reports with comment on size	193 (93%)	610 (90%)	372 (95%)	431 (88%)	128 (91%)	250 (90%)	425 (91%)
Number (%) reports with comment on excision margins	183 (88%)	578 (85%)	354 (90%)	407 (83%)	104 (74%)	242 (87%)	415 (89%)
Number (%) reports with comment on tumour in blood or lymphatic vascular channels	103 (50%)	333 (49%)	211 (54%)	225 (46%)	37 (26%)	143 (52%)	256 (55%)
Number (%) reports with comment on grade*	137 (87%)	450 (90%)	275 (98%)	312 (83%)	61 (72%)	201 (91%)	325 (93%)

*Women with invasive ductal carcinoma only.

Table 3 Frequency with which histopathological prognostic features are recorded by screening and non-screening laboratories stratified by throughput

Size	Presence or absence of tumour in vascular channels		Adequacy of surgical excision		Grade (invasive ductal carcinoma only)			
	Screening (n = 393) No (%)	Non-screening (n = 492) No (%)	Screening (n = 393) No (%)	Non-screening (n = 492) No (%)	Screening (n = 282) No (%)	Non-screening (n = 375) No (%)		
High or medium throughput (n = 744) (grade n = 572)	343 (95)	332 (87)	206 (57)	193 (51)	323 (89)	334 (87)	254 (97)	272 (87)
Low throughput (n = 141) (grade n = 85)	29 (94)	99 (90)	5 (16)	32 (29)	31 (100)	73 (66)	21 (100)	40 (63)

COMPARISON OF TEACHING AND NON-TEACHING LABORATORIES

Two hundred and seven (23%) cases were assessed in teaching and 678 (77%) in non-teaching laboratories. No significant differences were observed between teaching and non-teaching laboratories in the recording of tumour size ($\chi^2 = 1.6$; $df = 1$; $p = 0.2$), presence or absence of tumour in vascular channels ($\chi^2 = 0.007$; $df = 1$; $p = 0.93$), adequacy of excision ($\chi^2 = 1.06$; $df = 1$; $p = 0.30$), or tumour grade ($\chi^2 = 1.2$; $df = 1$; $p = 0.28$) (table 2).

COMPARISON OF SCREENING AND NON-SCREENING LABORATORIES STRATIFIED FOR THROUGHPUT

As screening laboratories were more likely to have a high throughput and as both of these characteristics were found to be significantly associated with the reporting of prognostic factors, their relative importance was further explored in an analysis which stratified screening and non-screening laboratories by throughput (table 3). The frequency with which tumour size, adequacy of excision, and tumour grade were recorded was consistently higher in screening laboratories than in non-screening laboratories irrespective of throughput.

Discussion

The importance of this survey is that it includes cases from all laboratories in a geographically defined population. The totality of this experience cannot be inferred from results reported by centres with a particular interest in the management of breast cancer. The histopathological profile of these tumours, however, was similar to that reported in other series.^{4,5}

Many laboratories achieved a high level of reporting for four of the five histopathological features investigated, with some recording

comments on specific prognostic factors in 100% of cases. However a few laboratories failed to comment on one or more prognostic factors in a substantial proportion of cases. The widespread underreporting of the presence or absence of tumour in vascular channels may reflect a reticence to record a negative finding or acknowledged difficulty in the recognition of vascular invasion within carcinomas.⁶

Tumour grade, presence or absence of tumour in lymphatic or blood vascular channels, and adequacy of excision were significantly more likely to be reported by high and medium throughput laboratories. Although our cut off points were arbitrarily chosen to yield a similar number of laboratories in each throughput category, this association was observed irrespective of where the cut off point was set. Higher throughput may enable pathologists to pursue a greater degree of specialisation and our results are consistent with studies that have shown that higher surgical throughput and surgical specialisation are associated with a better outcome.⁷⁻⁹ It is also possible that surgeons with a particular interest in the management of breast cancer may request information on prognostic variables more frequently and participate in multidisciplinary team meetings.

Involvement in the screening programme provides further opportunities for pathologists to specialise in breast cancer. Laboratories involved in the screening programme were more likely to record tumour size, grade, and adequacy of excision than non-screening laboratories irrespective of the level of throughput. This may follow from the availability of a NHSBSP standard proforma to report histopathological features of screen detected cancers and the routine use of aggregated statistics describing tumour size and grade to measure the performance of the programme.

Other studies have shown that women with breast cancer attending teaching hospitals were more likely to receive appropriate

management.^{10 11} However, the findings of this survey did not suggest that teaching laboratories were more likely than non-teaching laboratories to record prognostic factors.

Recent guidelines have emphasised the importance of adequate pathological reporting of breast cancers.^{2 6} It is hoped that the current reconfiguration of breast cancer services with its emphasis on professional audit and the monitoring of outcomes will lead to further improvements in pathology services.¹²

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