Carcinoma of the breast in East Anglia 1960-1975: a changing pattern of presentation?

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SUMMARY A study was made of the clinical stage at presentation in 10 081 cases of carcinoma of the breast registered with the East Anglian Cancer Registration Bureau between 1960 and 1975. Information about the length of clinical history was obtained in 8862 cases. There has been a gradual increase in the population-adjusted incidence of breast carcinoma in the region during the period studied. Since 1968, there has been a consistent increase in Stage I and II registrations, but a fall in Stage III registrations. Stage IV registrations have remained constant. A greater proportion of women with Stage I or II lesions present with a short clinical history, and this pattern has not changed during the course of the study. We suggest that increased interest in, and opportunities for, the early diagnosis of breast disease are leading to a change in the pattern of presentation.

Carcinoma of the breast is still the chief cause of cancer deaths among women in the British Isles (Doll, 1975). In recent years there has been increasing interest in diagnosis of the disease at an early stage, because this is thought to improve a woman's chances of prolonged survival (Duncan and Kerr, 1976). The technique of self-examination of the breasts has been widely publicised, and examination by a doctor frequently accompanies other screening procedures, notably cervical cytology. We wondered if this interest might be reflected in the pattern of presentation of a series of women with breast carcinoma recorded in a cancer registration bureau. We studied the stage at presentation of 10 081 patients diagnosed in East Anglia between 1960 and 1975. Accurate staging of breast carcinoma is known to be difficult because of the wide observer error in recording the relevant clinical signs; a further problem was the slight change in staging criteria adopted in 1972.

Materials and methods

The East Anglian Cancer Registration Bureau, founded in 1960, aims to maintain a register of all cases of malignant disease diagnosed in the region. Information reaches the bureau in the form of (i) hospital case notes which are automatically flagged by medical records departments and (ii) positive histological reports from biopsy and post-mortem specimens. In addition, the Office of Population Censuses and Surveys (OPCS) forwards to the

bureau all death certificates from the region which mention malignant disease. Data are stored in the form of punched cards which record clinical history, examination and operative findings, and details of treatment and follow-up.

We recorded the age of every patient with carcinoma of the breast registered between 1 January, 1960, and 31 December, 1975, the stage of her lesion at the time of diagnosis, and the length of clinical history—that is, the time for which symptoms were present before medical advice was sought. Staging was done according to the criteria of the International Union against Cancer (TNM classification of malignant tumours, 1968; 1974). These criteria were changed slightly in 1972; tumours measuring between 2 cm and 5 cm across their greatest diameter, without axillary node involvement, are now in Stage II instead of Stage I. Lesions of 5 cm or less in greatest diameter with fixation to pectoral fascia or muscle, but not to deeper structures, are now designated Stage I or II, rather than Stage III. It proved impossible to restage all lesions prior to 1972; cases were staged according to the criteria prevailing at the time of diagnosis. Because of inadequate information or inappropriate registration, 528 patients were excluded from the survey.

Population data for the East Anglian Region was obtained from the Registrar General's quarterly returns, and subsequently from the OPCS. The accuracy of these figures is necessarily limited by the assumptions involved in calculating them, and by the

overlap of regional catchment areas, especially after the reorganisation of health authority boundaries in April, 1974.

There were substantial changes in the age structure of the population during the period studied; in particular, there were increases in the age groups 20-34 and 65 and over compared with the age groups 35-49 and 50-64. Using these figures, incidence rates for carcinoma of the breast were calculated for different stages and age groups. Statistical tests were based on the χ^2 distribution.

Results

The distribution of patients according to age and clinical stage at the time of diagnosis is shown in Table 1. The annual incidence of breast carcinoma per 100 000 women in the area surveyed had gradually increased during the period of our study (Fig. 1). Incidence rates were also calculated for the four age groups 20-34; 35-49; 50-64; and 65 and over. These are shown, averaged over four-year intervals, in Table 2. As expected, the incidence rises with age; it also appears to have increased between 1960 and 1975 in every age group except the youngest.

The increasing incidence in recent years is largely attributable to increases in Stage I and II registrations (Fig. 1). Stage IV registrations have remained constant throughout, and Stage III registrations have tended to decline since 1967. The figures for Stages I and II have been combined to avoid problems resulting from the changes in staging criteria internationally adopted in 1972; a small number of cases which would previously have been allocated to Stage III were placed in Stages I or II

after 1972. It is worth noting that the trend towards an increase in Stages I and II, and a decline in Stage III, began well before the change in staging criteria.

Age-specific incidence rates for the different clinical stages are shown in Fig. 2. The numbers in the youngest age group are small and do not show any particular trend. In the three older groups, there is a consistent pattern of increasing incidence of Stages I and II and a falling rate of Stage III registrations from the late 1960s. This is most apparent in the age group 65 and over, where the rates for Stages I and II and Stage III were similar until 1967, and have since diverged markedly.

The relationship between the length of clinical history and the stage of the disease at the time of diagnosis is shown in Table 3. Accurate records of the history were available for 8862 cases (87.9%). There is a consistent difference between Stages I and II and Stages III and IV in the number of women with a history of symptoms for less than three months before seeking medical advice ($P < 0.001$). There has been little change in this pattern in the period of this study, except that there has been a trend for 'earlier' presentation of Stage IV lesions ($P < 0.01$).

Table 1 Age and clinical stage at time of diagnosis in 10 081 cases of breast carcinoma

	Age groups (years)				
	20-34	35-49	50-64	Over 65	All ages
Stage I	87	903	1175	1185	3 350
Stage II	59	653	1081	941	1 734
Stage III	43	387	882	1433	2 745
Stage IV	14	127	433	678	1 252
Total	203	2070	3571	4237	10 081

Table 2 Age-specific incidence rates for breast carcinoma averaged over four-year intervals between 1960 and 1975

	1960-63	1964-67	1968-71	1972-75
All ages:	68.05	73.05	74.32	79.41
20-34:	8.25	8.98	6.39	7.71
35-49:	76.92	79.95	88.03	92.04
50-64:	130.74	144.36	151.32	157.60
Over 65:	185.10	195.97	187.34	205.05

Fig. 1 Analysis by clinical stage at presentation of total yearly registrations of breast carcinoma with the East Anglian Cancer Registration Bureau between 1960 and 1975 (cases per 100 000 women).

Fig. 2 Analysis of clinical stage at presentation in four age groups between 1960 and 1975 (incidence expressed as cases per 100 000 women). Scale for youngest age group has been expanded fourfold.

Table 3 Relationship between the length of clinical history in breast carcinoma* and the stage of the disease at time of diagnosis

Years	STAGE I			STAGE II			STAGE III			STAGE IV		
	Total	History <3 months	%	Total	History <3 months	%	Total	History <3 months	%	Total	History <3 months	%
1960-63	646	404	62.5	466	301	64.6	542	194	35.8	219	54	24.6
1964-67	737	485	65.8	464	326	70.3	684	290	42.4	228	79	34.6
1968-71	859	550	64.0	542	310	57.2	716	288	40.2	275	89	32.3
1972-75	762	515	67.6	1008	635	63.0	450	181	40.2	264	111	42.0
Significance of differences between periods of years (χ^2 test)	NS			NS			NS			P<0.01		

*Length of clinical history = time between patient's becoming aware of lesion and seeking medical advice.

Discussion

Our results appear to show a change in the pattern of presentation of carcinoma of the breast in East Anglia during the past 16 years, with a shift towards diagnosis at an 'early' stage (clinical Stages I and II) rather than at the locally advanced Stage III. During the early 1960s the gradually increasing overall registration rate was paralleled by rises in Stages I, II, and III; after 1968, the registration rate for Stages I and II rose steeply and there was a corresponding decline in the rate of Stage III lesions. This pattern of change is repeated in all the age groups studied, with the possible exception of the youngest, where the number of cases was small.

The cancer registries of Saskatchewan and Connecticut also report an overall increase in the incidence of carcinoma of the breast in women aged 35 years and over between 1945 and 1960, while the incidence in women under 35 actually declined (Barclay *et al.*, 1975). The clinical staging of the tumours was not discussed in that study. An earlier report, from the registries of Connecticut and California, claimed an increased proportion of localised, as opposed to regional or distant, disease during the period 1940-1969 (Cutler and Connelly, 1969). Clinical staging of breast carcinoma is notoriously unreliable (Yorkshire Breast Cancer Group, 1977) and it is recognised that many apparently 'early' lesions may already have metastasised to sites which are not clinically obvious at the time of diagnosis (Baum, 1976). Our patients had been staged by a variety of observers, using clinical examination and such ancillary techniques as were thought appropriate or were available at the time. As far as possible, we have checked the staging from the original notes, but some heterogeneity in the quality of data collection is inevitable in a study of this type. Radiological and isotope scanning techniques have been employed more frequently in recent years in an attempt to stage tumours as accurately as possible before beginning treatment, and this might have been expected to increase the proportion of later stage registrations. In fact, however, the registration rate for Stage IV lesions has remained relatively constant during the period of this study.

There are three potential explanations for the observed change in the proportion of Stage I and II to Stage III and IV lesions. Firstly, a new risk factor may be affecting the population and causing an excess of new tumours in the latter part of the study. If this is so, then the factor must affect all age groups, for each one except the youngest manifests the same pattern. Secondly, more intensive screening may lead to the detection of low grade

or incidental malignancy in long-standing breast lumps. This possibility is discounted by the finding of relative constancy in the proportion of Stage I and II lesions presenting with a history of three months or less. Finally, the shift may reflect a tendency towards diagnosis at an earlier stage as a result of increasing awareness of the importance of early diagnosis and a willingness to present lumps for examination.

There has not been a formal screening programme for breast cancer in East Anglia, although breast examination is routine at the local authority cervical cytology clinics. Davy and Summerfield (1970) found previously unreported breast lumps in 2.8% of women seen in a mobile cervical cytology clinic. A number of general practitioners operate a limited screening service, including breast palpation in association with cervical cytology. Cytological screening for cervical carcinoma was made available throughout the region in 1965, and it is perhaps significant that the trend towards earlier diagnosis of breast lesions started soon afterwards. However, the trend is preserved in the oldest age group, whose response to the offer of cervical screening is known to be poor (de Bono *et al.*, 1978).

The relationship of the ultimate prognosis of women with breast carcinoma to the clinical stage of the tumour at the time of diagnosis remains uncertain, but it does seem that treatment at an early stage improves the quality of life and lengthens the recurrence-free interval (Duncan and Kerr, 1976). A national screening service for carcinoma of the breast is not thought to be justified at the present time (Bywaters and Knox, 1976), but our results suggest that increased publicity, education, and perhaps an increasing awareness of the need to include breast examination in the course of routine medical examination, may already be making an impact on the pattern of this disease.

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