

Death certification in cancer of the breast

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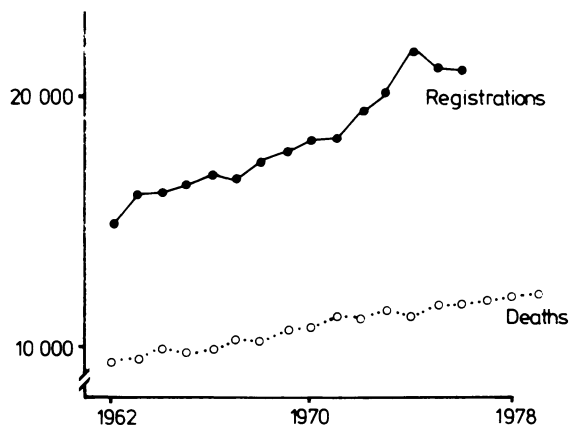
Abstract

The cause of death entered on the death certificates of 193 patients originally diagnosed as having cancer of the breast was compared with information obtained from clinical records, cancer registry records, and necropsy findings to determine the accuracy of death certification and the proportion of patients who, though dying from another cause, still had overt signs of cancer of the breast.

It was found that the overall error in certifying cause of death as breast cancer was small, being an underestimate of about 4%. About a third of patients with breast cancer dying from other causes had overt signs of breast cancer at the time of death.

Introduction

A comparison of registrations of cancer of the breast with deaths from the disease in England and Wales over the past two decades shows that the figures for deaths fall well below those for registrations (figure). The number of deaths is about 65%



Deaths from cancer of the breast and registrations of cancer of the breast in England and Wales, 1962-79.

the number of registrations four years earlier (the median survival time for patients with breast cancer), suggesting that, if errors in registration and certification are ignored, an appreciable proportion of patients experience what has been defined as "personal" cure—that is, they die from other causes with no overt signs of cancer of the breast.¹⁻³

This proportion of patients cannot be assumed to be simply

the 35% difference between the numbers of deaths and registrations because various types of error may affect the accuracy of the figures.

Inaccuracies in registration figures—Errors may occur through faulty diagnosis or patients escaping registration. In cancer of the breast errors due to these two causes are likely to be small. Diagnosis is reasonably straightforward, and patients who are initially missed by cancer registries are often absorbed into the system when they die because registries receive copies of all death certificates issued in their area that mention cancer. A small degree of underregistration may be caused by patients who escape registration but are successfully treated and either remain well or die from another cause without mention of cancer of the breast on their death certificate.

Inaccuracies in figures for deaths—Errors in death certification could lead to either underestimation or overestimation of deaths from cancer of the breast. Studies of death certification in the United Kingdom have shown that the error for deaths from all causes is of the order of 50% but the error for cancer of the breast alone is much smaller.³⁻⁵ Heasman and Lipworth estimated that if the death certificates of all patients dying from cancer of the breast were based on necropsy findings the death rate from this cause would be increased by only 6%.³ Though Waldron and Vickerstaff studied only nine cases of cancer of the breast, in seven they found no discrepancy between necropsy findings and the certified cause of death.⁴ When the medical services study group of the Royal College of Physicians studied a group of patients, all of whom were under 50 years old, cancer of the breast did not feature among those for whom major discrepancies in certification were found.

Inaccuracies due to coding system—A death is usually coded as cancer of the breast only if this is given as the underlying cause in part I of the death certificate. If overt signs of the disease are present at death but it is not considered to be the underlying cause of death it may be mentioned in part II of the certificate, but the patient will not contribute to the published mortality statistics for cancer of the breast. The proportion of patients falling into this category has not yet been reported from national records.

The aim of our study was to provide more evidence on, firstly, the errors in certification of cancer of the breast that could lead to wrong coding of the death and, secondly, the proportion of patients with breast cancer dying from other causes but with overt signs of cancer of the breast.

Methods

The Cambridge Cancer Registry aims to register all cases of cancer in its area (population 920 000). Registration began in 1960, and cards holding the data are filed by year of registration. Initially, a search was made among registrations of cancer of the breast for all patients who died in 1980. This produced 309 deaths occurring up to 21 years after the patients had first been treated. For logistic reasons we confined the sample to 200. They were selected from the original 309 by omitting roughly every third patient on the list.

We attempted to classify the death of each patient as being due to (a) cancer of the breast; (b) another cause but with overt signs of cancer of the breast; or (c) another cause with no overt signs of cancer of the breast.

Eighty six per cent of the sample, although not necessarily originally treated by radiotherapy, had at some time been referred to the radiotherapeutic centre at Addenbrooke's Hospital, Cambridge, and had been followed up through radiotherapy clinics. Consequently, clinic notes existed for these patients, and they were used, together

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with any available follow up information on the cancer registry cards and necropsy reports, to classify the deaths. When radiotherapy clinic notes were not available the classification depended mainly on cancer registry information.

The Office of Population Censuses and Surveys supplied copies of the cause of death entries on the death certificate of each patient, which were then compared with the results of the independent classification. Only one death certificate could not be traced. The cards of two patients had been duplicated in the registry owing to bilateral disease, and in four cases nothing had been recorded after the first treatment, making classification impossible. When these patients were omitted 193 records were left for analysis.

Results

ERRORS IN CAUSE OF DEATH

Initial comparison of the cause of death entered on the death certificate with the classification derived from the records resulted in agreement in 176 (91%) of the cases (144 breast cancer and 32 other causes) and disagreement in 17 (9%) (nine given as breast cancer and eight as another cause on the death certificate). (Other cause means death from a different cause regardless of whether overt symptoms of cancer of the breast were present.)

When discrepancies occurred the records were reviewed to assess the strength of the evidence that had led to a classification different from that given on the death certificate. Of the nine patients certified as dying from cancer of the breast, six had been classified as dying from another cause but with cancer of the breast present. In the three other cases the last entry in the notes had been made at least three months before death. In these nine cases, therefore, we had no reason to doubt that the certification of underlying cause of death was correct.

Among the eight patients who were certified as dying from another cause the review supported the death certificate in two. In the first case a necropsy report that came to light after the initial classification had been made showed cancer of the bronchus. In the second the entry for parts Ia and Ib of the necropsy report was "Terminal aspiration of blood into main air passages, and chronic duodenal ulcer with erosion of artery into base of a posterior ulcer." The report also mentioned widespread secondaries but these were probably not the underlying cause of death.

Table I gives details of the six cases in which evidence from the records strongly supported cancer of the breast as being the cause of death but the death had been coded under another heading because of the entry on the death certificate. We calculated that the overall prevalence of error was six cases out of 193 (3.1%) and that the number of deaths coded as due to cancer of the breast should have been increased from 153 to 159 (3.9%).

DEATHS FROM OTHER CAUSES WITH CANCER OF THE BREAST PRESENT

Table II shows how the deaths were finally classified. The six cases listed in table I were classified as deaths from cancer of the breast.

Information recorded in part II of the death certificate does not always reliably indicate whether overt signs of cancer of the breast were present at death. Of the 16 patients who died from other causes with overt signs of cancer of the breast, five had no mention of cancer of the breast on the certificate. Of the 18 who died from other causes with no overt signs of cancer of the breast, three had cancer of the breast mentioned in part II. Thus the overall prevalence of error was about 24% (eight out of 34).

TABLE II—Cause of death in patients known to have suffered from breast cancer. (Figures are numbers (%) of patients)

	Cancer of the breast	Other cause with cancer of the breast present	Other cause with no overt signs of cancer of the breast
Observed sample (n = 193)	159 (82)	16 (8)	18 (9)
Estimated for a complete sample* (n = 227)	169 (74)	21 (9)	37 (16)

*A complete sample means the sample of deaths in 1980 that could have been drawn from the cancer registry records if registration had been started long before 1960 and deaths after 21 years could have been fully represented.

Only two patients died more than 21 years after first treatment: one died in the 31st year from cancer of the breast and the other in the 36th year from another cause but with cancer of the breast present. Both had been treated before 1960 for cancer of the breast on the side other than the one recorded by the cancer registry.

Discussion

Our results on the accuracy of death certification for cancer of the breast are consistent with the limited amount of evidence from previous studies in the United Kingdom. Our finding that deaths from cancer of the breast were underestimated by about 4% is similar to the 6% reported by Heasman and Lipworth.³ In fact, the figure may be lower than 4% as some of the nine patients certified as dying from cancer of the breast but whose records suggested that death was due to some other cause may have been wrongly certified. Such errors would decrease the

TABLE I—Details of six cases in which death was certified as being from another cause but clinical records suggested it was almost certainly from cancer of the breast

Case No	Age at death (years)	Death certificate	Code	Evidence from records	Comments
1	59	Ia Carcinoma of bronchus b - c - II -	1629	No evidence to support diagnosis of carcinoma of the bronchus. Less than 3 months before death the patient was reported to have bone metastases from carcinoma of the breast	Possibly a hurried certification by a doctor with no previous connection with the patient
2	65	Ia Respiratory failure b Bronchopneumonia c - II Carcinoma of the breast	485X	Bone metastases were present in the pelvis 4 months before death and being treated with nandrolone. One month before death patient was confined to bed or wheelchair	Carcinoma of the breast would have been more appropriately entered in part Ic of the certificate and would then have been taken as cause of death
3	76	Ia Acute left ventricular failure b Arteriosclerosis c Carcinoma of left breast II Carcinomatosis	4409	Mediastinal metastases present only a few days before death	Coder had to choose arbitrarily one of two apparently unconnected causes of death listed in part I of the certificate. Arteriosclerosis was chosen, but the records suggest carcinoma of the breast would have been more appropriate
4	68	Ia Coma b Carcinomatosis c Primary unknown II -	1991	8 months before death patient had secondaries in chest from carcinoma of the breast that were controlled with tamoxifen for some months	Carcinomatosis was almost certainly due to carcinoma of the breast, but this was not mentioned on the certificate so death was coded as due to secondary of unknown origin
5	89	Ia Carcinomatosis b Primary unknown c - II Diabetes mellitus	1991	3 months before death patient was receiving tamoxifen for secondaries from carcinoma of the breast	As for case 4
6	81	Ia Accumulation of intravenous fluid in right pleural cavity b Perforation of vein by intravenous catheter inserted for feeding c - II Disseminated carcinoma (coroner's verdict—misadventure)	E8705 9982	Treated as inpatient for disseminated carcinoma of the breast	Patient being treated for disseminated carcinoma of the breast when died owing to faulty drip feeding procedure. Such deaths should more appropriately be classified as due to carcinoma

number of deaths from cancer of the breast and thereby reduce the estimated underrecording. Both this study and that of Heasman and Lipworth³ suggest that the figures derived from death certificates for deaths from cancer of the breast in the United Kingdom present a reasonably accurate picture.

The second objective of this study was to ascertain the proportion of patients who die from other causes but have signs of cancer of the breast at death. The first row of table II shows that just under half of the patients who do not die from cancer of the breast fall into this category. With two exceptions, however, the deaths studied occurred within 21 years of the first treatment because the cancer registry records began in 1960. In an unselected series of patients with breast cancer treated during 1947-50 Brinkley and Haybittle found that about 11% survived beyond 21 years and that of those surviving for 20-30 years only 30% died from cancer of the breast.⁶ The patients in the present study were treated in the period 1960-80. Haybittle found that the survival curve for patients treated during 1960-71 was above that for the 1947-50 series by about 5% at 15 years⁷; thus a 21 year survival of about 16% might be expected in the period from which our patients were drawn. This being so, 36 deaths occurring more than 21 years after treatment would be necessary to complete the picture in the present study (two of these were included). If we assume that the proportion of deaths from cancer of the breast after 20-30 years observed by Brinkley and Haybittle may be applied to all deaths after 21 years,⁶ then 11 of the later deaths might be expected to be from cancer of the breast, leaving 25 attributable to other causes. In the present study, of the eight patients dying from other causes 10-21 years after treatment, two had cancer of the breast present. If we assume that this ratio persists throughout further follow up we would expect six of the 25 patients dying from other causes after 21 years to have cancer of the breast present. The estimated final allocation of deaths is as shown in the second row of table II.

The figure of 74% for deaths from cancer of the breast is higher than the 65% derived from the figures for national incidence and mortality (figure). Some of the difference (2-4%) can be accounted for by the small underrecording of deaths from cancer of the breast found both in this study and by Heasman and Lipworth.³ Another small part (3% at the most) may be due

to the assumption that the proportion of deaths due to cancer of the breast remains constant after 20 years, when in fact it probably falls as other causes of death increasingly take their toll. Moreover, the size of the sample means that our estimate of 74% has a lower 95% confidence limit of 68%. Thus our results accord with the national mortality and incidence data.

Our other finding was that the proportion of those dying from other causes who had overt signs of breast cancer at death was quite high (21 out of 58 in the second row of table II), which suggests that only 16% of patients may experience "personal" cure. The difference between the national figures for registrations and deaths from cancer of the breast is, therefore, likely to be a considerable overestimate of the number of patients who remain free of symptoms of their breast cancer before dying from another cause; it cannot be assumed to represent a group who have been cured.

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SHORT REPORTS

Intermittent self catheterisation in adults

In 1972 Lapidès *et al* showed that self catheterisation was a safe and effective way of managing patients with a neuropathic or atonic bladder.¹ Since then it has been used widely in children with incontinence associated with spinal dysraphism^{2,3} and occasionally in adults.⁴ By completely emptying the bladder catheterisation improves a dilated upper urinary tract even in the presence of reflux and infection. We reported our results in children in 1978⁵ and now present our experience in adults.

Patients, methods, and results

We studied 45 women and one man with bladder dysfunction aged 17-86 (table). Most of them had difficulty in voiding and retained a large amount of residual urine. Patients were taught how to use a stainless steel or plastic catheter while lying down and with the help of a mirror. Sometimes we used a Brijnjen-Boar catheter, which is designed for self catheterisation and has a mirror attached (Thackray, UK). Patients soon learnt to catheterise themselves while standing in front of the lavatory or sitting well back on the seat. They catheterised themselves at least four times daily. Catheters were washed after use and either boiled or kept in sodium hypochlorite solution. A video was available for teaching outpatients, who were given the doctor's home telephone number in case they wanted advice. Our policy was to treat urinary

infections only if the patient had symptoms. Chemoprophylaxis was used for five patients.

Nine patients failed from the start and six abandoned the method because they found it unpleasant or too difficult or remained wet. Two reserved the catheter for use in the event of acute retention. Twenty nine patients continued self catheterisation, of whom seven resumed acceptably normal voiding. Febrile urinary infections were exceptional once the bladder was being

Details of patients attempting self catheterisation

Condition	Catheterising:			Total (n = 46)	Mean age (years)
	Continued (n = 22)	Discontinued (n = 9)	Failed (n = 15)		
Intervertebral disc lesions	2	1	4	7	37
Spina bifida	6	1	2	9	34
Spinal trauma	2		2	4	33
Spinal tumour	1	2		3	56
Meningitis	1			1	69
Transverse myelitis		1	1	2	56
Spinal artery occlusion		1		1	19
Paget's disease		1		1	73
Cerebral palsy			1	2	24
Multiple sclerosis	2		1	3	43
Diabetic neuropathy	2			2	49
Systemic lupus erythematosus	1			1	66
Atonic bladder	4	1	2	7	70
Pelvic conditions	1		2	3	50