Time between presentation and treatment of six common cancers: a study in Devon

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T A DUDGEON

SUMMARY. The time between a person presenting to a general practitioner with a symptom of cancer and that person starting treatment has been studied in Devon. Retrospective analysis was undertaken of the general practitioner records of 1465 patients proven to have cancer who were registered with 245 general practitioners. During inspection of these records dates of first presentation, of referral, of first hospital consultation and of the start of treatment were noted for people with six common types of cancer (cancer of the breast, large bowel, lung, oesophagus, prostate and stomach). The general practitioner stage time and hospital stage time (pre-appointment and post-appointment) were calculated for each patient. Large differences were found in median times for the general practitioner stage according to the type of cancer, ranging from a median value of 0 days for people with breast cancer to 84 days for people with cancer of the oesophagus. For patients with cancer of the breast, large bowel, lung or prostate, median general practitioner times were shorter than median hospital stage times, while for patients with cancer of the oesophagus and stomach cancer, median general practitioner stage times were longer than median hospital stage times. Comparison of the hospital stage times for people with breast cancer and cancer of the large bowel showed notable differences between the four health districts in Devon, pre- and post-appointment times being twice as long in one district as in another. This retrospective record analysis was acceptable to participating practitioners. The results provide a basis for general practitioners and hospital staff to review their own work.

Keywords: cancer; treatment delay by doctor; early diagnosis.

Introduction

CANCER is one of the most important diseases of modern times. It is responsible for a quarter of all deaths in the United Kingdom.[1] It is probably feared more than any other condition.[2]

Effective treatment is now possible for an increasing number of types of cancer, especially if the disease is detected in its early stages.[3-7] The ability of a general practitioner to identify a person who has cancer or who is in need of investigation for cancer is an important clinical skill, as is the ability of the consultant to respond to such patients after referral.

Stages in the process of diagnosis and early management of cancer were first described by Gray in his Hunterian Society gold medal essay.[8] Subsequently, Jenkins[9] analysed diagnostic delay in 55 new cases of carcinoma arising in one year in general practice. In a study of delay patterns in gastrointestinal cancer, MacAdam suggested that the median time between first symptom and diagnosis was greater in cases of cancer of the caecum, ascending colon and transverse colon than in cases of gastric and rectal cancer.[10] Later studies have also reported delays for people with these and other types of cancer.[11-14] In general, the study samples reported have been small and comparisons between figures for different types of cancer have not been made.

The purpose of this study was to identify a large number of people who had a history of one of six common types of cancer and to determine the times taken from a patient's first presentation at the general practitioner with a symptom or sign of the disease to the start of treatment at the hospital. The study also aimed to examine variation between the four health districts in Devon.

Method

Study sample

The study was carried out between 1986 and 1990. A letter was sent to all general practitioner principals in each practice on the list of the Devon family practitioner committee, inviting them to take part. Participating general practitioners were asked to notify the project secretary of all people currently registered with them who had a history of cancer.

A general practitioner working as a part time research fellow (T A D) visited each participating practice and extracted the required information by examining the general practitioner records, referral letters, hospital letters and reports for each person with one of six types of cancer: cancer of the breast, large bowel, lung, oesophagus, prostate and stomach. These were chosen as they are the major cancers with which patients most commonly present to general practitioners in the UK.[15] Patients were admitted to the study only if a positive diagnosis of cancer had been notified to the general practitioner in writing by a consultant. Patients currently living in Devon who had been diagnosed and treated elsewhere were not included in the study. Confidentiality was assured by coding each practice, each general practitioner and each patient, by ensuring that information was only entered on coded forms and by keeping the register secure.

Time between presentation and treatment

For each type of cancer, the first record in the notes of one or more predetermined symptoms or signs determined the date of presentation. The index signs and symptoms were chosen in consultation with colleagues (Appendix 1). The general practitioner stage was defined as the time between first presentation and the date of referral to a hospital consultant. The hospital stage was divided into pre-appointment time (from referral to date of first consultant appointment) and post-appointment time (from first consultant appointment to date of first treatment).

Analysis

The objective was to measure the range and midpoint times of the three stages for people with cancer. Bias was minimized by calculating the median time in days for each stage for each type

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of cancer separately. In presenting the results, median rather than mean values are used as most accurately representing the relevant midpoint.

Results

Of the 531 general practitioner principals in Devon at the beginning of the study 245 (46%) from 89 different practices agreed to take part. Those who responded came from both non-training and training practices and covered 34 city, 32 semi-rural and 22 rural practices from all parts of Devon.

The project secretary was notified of 3116 people with a history of cancer. A total of 1465 patients had cancer of one of the six major types under study. The majority of patients presented with a symptom or sign owing to primary cancer. Data for general practitioner times were available in 1097 records (75%), for pre-appointment hospital times in 1084 records (74%) and for post-appointment hospital times in 1129 records (77%).

A wide range of times was recorded for each type of cancer for each of the stages (Table 1). The general practitioner interval ranged from a median value of 0 days for people with breast cancer to 84 days for people with oesophageal cancer. Median pre-appointment hospital times and post-appointment hospital times varied less widely. Overall the median interval times for people with cancer of the breast, large bowel, lung and prostate were less during the general practitioner stage than during the total hospital stage, whereas for people with cancer of the oesophagus and stomach they were greater.

Cancer of the breast and large bowel

For cancer of the breast and large bowel, the two most common types found, the cumulative percentage of people who had completed each stage and the time elapsed since the beginning of the stage were determined (Figures 1 and 2). For people with breast cancer, 75% had been referred to hospital within four days of presentation to a general practitioner, whereas after first presentation with bowel cancer, it took 90 days for 75% to be referred. In the hospital stage, 25% of people with breast cancer were still waiting for their first consultation 20 days after referral as were 25% of people with cancer of the large bowel. Having seen the consultant, 85% of people with breast cancer started treatment within 30 days whereas it took 60 days for 85% of people with cancer of the large bowel to start treatment.

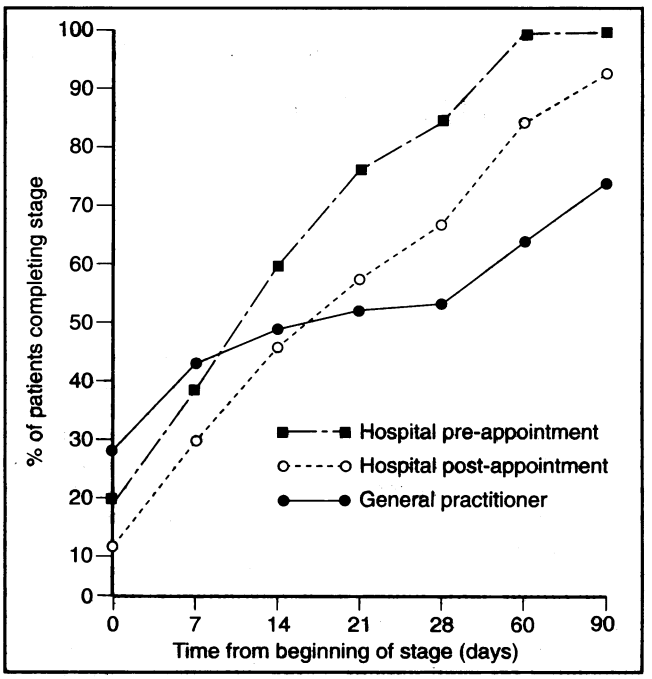

Figure 1. *Time taken by patients with cancer of the large bowel to complete the general practitioner and hospital stages.*

These figures, from the whole of Devon, obscured marked differences between the four health districts (Table 2). Regarding bowel cancer the time taken for 75% of patients to complete the general practitioner stage was similar in districts W, X and Z but general practitioners in district Y appeared to be faster in suspecting and referring patients.

Regarding hospital times, the time taken for 75% of both breast and bowel cancer patients to complete both pre- and post-appointment time was twice as long in district W than in district X. In two districts out of four, 25% of patients with bowel cancer had not started treatment 60 days after they had first seen a consultant.

Table 1. Median number of days and range of days of general practitioner stage and hospital stage and total time between presentation and treatment, by type of cancer.

	Median time (days) (range) between:				
	Presentation and referral[a]	Referral and appointment[b]	Appointment and treatment[c]	Referral and treatment[d]	Presentation and treatment[e]
Breast	0 (0–2923) (*n* = 560)	11.0 (0–781) (*n* = 553)	13.0 (0–3705) (*n* = 584)	26.0 (0–3759) (*n* = 552)	29.0 (0–3759) (*n* = 600)
Large bowel	27.5 (0–2689) (*n* = 316)	11.0 (0–370) (*n* = 310)	17.0 (0–2201) (*n* = 324)	31.0 (0–2208) (*n* = 306)	79.0 (0–3132) (*n* = 328)
Lung	31.0 (0–713) (*n* = 59)	7.0 (0–80) (*n* = 58)	13.0 (2–704) (*n* = 59)	37.0 (2–707) (*n* = 53)	70.0 (12–835) (*n* = 59)
Oesophagus	84.0 (0–431) (*n* = 27)	10.0 (0–76) (*n* = 27)	15.5 (1–=88) (*n* = 26)	28.0 (0–121) (*n* = 27)	92.0 (16–542) (*n* = 27)
Prostate	20.0 (0–716) (*n* = 101)	15.0 (0–194) (*n* = 104)	28.0 (0–722) (*n* = 103)	52.0 (0–784) (*n* = 101)	117.0 (2–805) (*n* = 104)
Stomach	66.0 (0–875) (*n* = 34)	7.0 (0–57) (*n* = 32)	30.0 (0–33) (*n* = 33)	43.0 (1–1123) (*n* = 29)	96.5 (0–1143) (*n* = 33)

n = number of timed cases. [a] General practitioner stage. [b] Pre-appointment hospital stage. [c] Post-appointment hospital stage. [d] Total hospital stage. [e] Overall time.

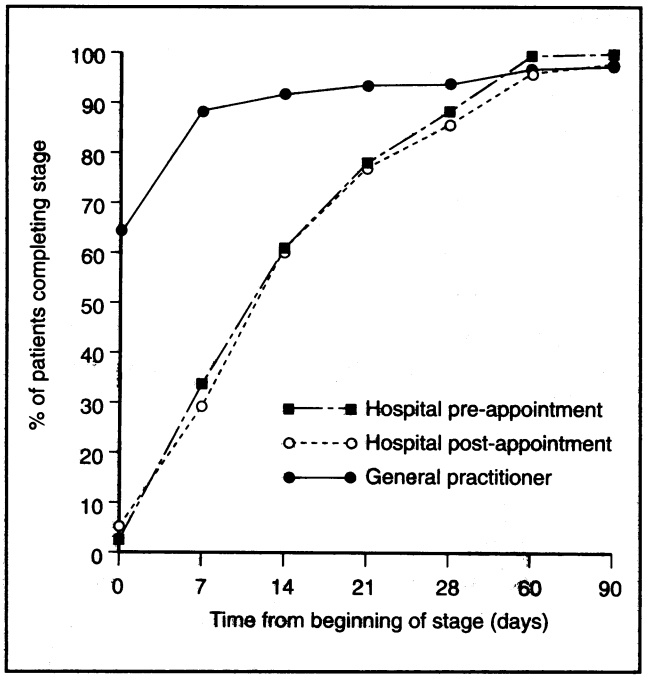

Figure 2. *Time taken by patients with breast cancer to complete the general practitioner and hospital stages.*

Table 2. Time taken for 75% of patients with cancer of the breast or large bowel to complete each stage, by health district.

	Time taken for 75% of patients to complete each stage (days)		
		Hospital stage	
District	GP stage	Pre-appointment	Post-appointment
Cancer of the breast			
W (*n* = 211)	7	28	28
X (*n* = 73)	<7	14	14
Y (*n* = 93)	7	21	21
Z (*n* = 107)	<7	21	21
Cancer of the large bowel			
W (*n* = 151)	>90	28	60
X (*n* = 36)	>90	14	28
Y (*n* = 45)	60	21	28
Z (*n* = 41)	>90	21	60

n = total number of cases.

Discussion

The measurement of stage times presents a number of problems; the difficulty of obtaining reliable information is one such problem. Most previous studies have relied on the memory of patients or on hospital records and the memories of general practitioners.[11,12,14] In this study, stage times have been based on retrospective analysis of the written information contained in the general practitioner records for those patients subsequently identified as suffering from cancer. A major advantage of this method is its objectivity, the information collected being based only on firm written evidence.

Another problem arises in the definition of criteria used to identify the signs and symptoms of cancer. When the symptoms and signs were chosen for use in this study, no evidence was available as to their predictive value. However, during the course of the project Holtedahl published the results of a study into the early diagnosis of cancer in general practice.[16] The results showed that the symptoms and signs identified in our study had both high positive predictive values and high likelihood ratios. However, a patient with ulcerative colitis may present with weight loss and bloody stools (symptoms suggesting the possibility of cancer) well before carcinoma arises. A breast lump may be a cyst for some time before malignancy develops.

The decision as to how to define the start of the general practice stage time will have a marked effect on the results obtained. If the stage is measured from the date on which a symptom which could be attributable to cancer is presented, some long stage times might be expected, as indeed can be seen in Table 1. This will result in skewing of the distribution curve to the right. But the alternative of measuring general practitioner time from the last negative test in a person with suspicious symptoms would introduce non-ascertainable inconsistency. In this study these problems have been faced by consistent strict application of predetermined criteria in all cases, by accepting that the distribution curve would thereby be skewed, and by expressing the results as median rather than mean values.

Involvement of general practitioners in surveys of cancer patients within large populations are uncommon although there are exceptions.[17] This study is the first in the UK in which all general practitioners within four health districts have been asked to volunteer to have their diagnostic ability and early management of people with cancer analysed. Clearly, with a response rate of 46%, the figures obtained cannot be claimed to be representative. But invitations to general practitioners within a district to take part in a study with an outcome less threatening to them reported a similar response.[18]

The median general practitioner stage time was found to differ considerably between cancer types (0 days for breast cancer and 84 days for cancer of the oesophagus). Moreover the range of recorded general practitioner stage times for each type was very wide, for example, between 0 days and 2923 days for breast cancer. In discussion of individual cases with general practitioners it has become clear that there are many causes for apparent delay other than a low index of suspicion. A short general practitioner stage does not necessarily indicate good practice, neither does a longer stage necessarily indicate poor diagnostic skills.

The reasons for delay among general practitioners and hospital staff as a whole are complex and need further investigation. However, at an individual level the results of this study can provide a basis for discussion and a stimulus for both general practitioners and hospital staff to review their own work.

The Royal College of General Practitioners has described essential criteria for fellowship by assessment.[19] One criterion is that 'the doctor will demonstrate a commitment to the principle of early diagnosis by auditing the classic symptom-to-diagnosis interval in a sample of patients for three malignant and three non-malignant conditions'. It is encouraging that the majority of general practitioner records examined contained sufficient information for this procedure to be carried out without difficulty.

In conclusion, by successfully timing over 1000 patients through the system from presentation to treatment this study has demonstrated the feasibility of checking aspects of health care delivery to cancer patients in a district by analysis of stage times. It has also raised important questions regarding diagnostic skills, management skills and educational needs. For general practitioners in Devon it has highlighted the need for them to review their own diagnostic procedures on a regular basis.

Appendix 1. Index symptoms and signs used to determine patients' date of first presentation with cancer.

Cancer	Signs and symptoms	
	Primary site	Secondary site
Breast	Lump in breast (single, palpable) Nipple inversion or eczema Blood discharge from nipple Ulceration	Lymphadenopathy Persistent weight loss
Large bowel	Persistent alteration of bowel habit Rectal bleeding Melaena Persistent anaemia	Persistent weight loss
Lung	Persistent cough Persistent infection Haemoptysis	Lympadenopathy Weight loss
Oesophagus	Difficulty swallowing Persistent dribbling Persistent reflux Indigestion	Persistent weight loss
Prostate	Dribbling micturition Hesitancy Haematuria	Bone pain Pathological fracture
Stomach	Persistent epigastric pain Haematemesis	Anorexia Lassitude Jaundice

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