

THE EARLY DIAGNOSIS OF CANCER

Five Years Experience in General Practice

IAN R. MCWHINNEY, M.D., M.R.C.P.

Stratford-on-Avon

The family doctor's experience of cancer is different from that of his hospital colleagues. His responsibilities begin with the first symptoms and often continue throughout a long and painful illness. Although his cases are few, they are not limited to one type or to one age group; he therefore sees cancer as it occurs in the population at large. The report which follows is presented in the hope that something may be gained—especially in the field of early diagnosis—by looking at cancer from the family doctor's point of view.

Material

During the five years 1957 to 1961, all cases of cancer diagnosed in one general practice were recorded. Cancer was defined as any form of neoplastic disease dangerous to life and included, therefore, such non-metastasizing forms as rodent ulcer and brain tumour. Temporary patients, and those entering the practice with a diagnosis already made, were not included. The National Health Service list was 6,681 in January 1957 and 7,675 in December 1961: there was in addition a small number—not more than 200—of private patients.

Diagnosis

The diagnosis of cancer is notoriously uncertain, especially in the aged. It is necessary, therefore, to say how the diagnosis was reached in these patients: in 23 it was confirmed by histological examination of the excised tumour, in 12 by biopsy, in 13 by necropsy and in 22 by laparotomy or thoracotomy. The patients with leukaemia and one of those with myelomatosis were diagnosed by blood and bone marrow examination. In the remainder the diagnosis was clinical or radiological, or both.

Results

The distribution of cases according to sex, age, and site of the primary growth is shown in table I. The total incidence shows a steady rise in each decade after the third to a maximum in the eighth; 43 of the 98 patients were over the age of 70. That this is

not due to any preponderance of old people in the practice is shown by comparison with the age distribution of the general population (table II).

TABLE I
AGE AND SEX INCIDENCE OF CANCER AT ALL SITES

Site	Sex		Age group							Total
	M	F	20-30	30-40	40-50	50-60	60-70	70-80	80-90	
Lung	14	3	-	-	-	5	6	5	1	17
Stomach	7	4	-	-	-	1	5	3	2	11
Colon and rectum ..	6	4	-	-	1	-	2	4	3	10
Skin (including lip)	4	6	-	1	1	1	1	5	1	10
Breast	-	10	-	1	3	2	2	1	1	10
Ovary	-	8	-	-	1	2	2	3	-	8
Brain	1	3	-	-	1	3	-	-	-	4
Pancreas and ampulla of Vater	2	2	-	-	-	1	2	1	-	4
Cervix uteri	-	3	-	-	1	1	-	1	-	3
Prostate	3	-	-	-	-	-	1	1	1	3
Thyroid	-	2	-	-	-	-	-	2	-	2
Kidney	-	1	-	-	-	-	-	-	1	1
Liver	1	-	-	-	-	-	-	1	-	1
Pharynx	1	-	-	-	-	-	-	1	-	1
Uterine body	-	1	-	-	-	-	1	-	-	1
Retroperitoneal sarcoma	1	-	-	-	1	-	-	-	-	1
Reticulosis	2	2	1	-	1	-	1	1	-	4
Myelomatosis	-	2	-	-	-	-	-	2	-	2
Leukæmia	2	1	1	-	1	-	1	-	-	3
Gall bladder	-	2	-	-	-	-	-	2	-	2
Total	44	54	2	2	11	16	24	33	10	98

TABLE II
PROPORTION OF PRACTICE POPULATION IN OLDER DECADES IN 1961 COMPARED WITH PROPORTION OF GENERAL POPULATION IN THE SAME DECADES (1959)

Age group	Practice (1961)		General population (1959)	
	Number	Percentage of total	Number	Percentage of total
50-60	791	10.5	6,844,000	13.1
60-70	506	6.7	4,841,000	9.3
over 70	483	6.4	3,860,000	7.4

Presenting Symptoms

Tables III, IV, and V show the presenting symptoms in the three main internal sites of cancer and their relationship to x-ray findings and the histology of the tumour. Presenting symptoms are those

noted at the patient's first visit to the surgery; second symptoms are new complaints noted not later than one month after the first visit.

Carcinoma of the lung (18 cases, table III). Cough was a presenting symptom in two patients and a second symptom in two. Haemoptysis was a presenting symptom in one and a second symptom in one, but occurred later in another five. Five patients presented with dyspnoea on exertion, tightness in the chest, or wheezing; in four, gastric symptoms were prominent—a mode of onset reported by Weaver and Balme (1960); four complained of lassitude, exhaustion, or malaise; one presented with an attack of bronchitis and one with an attack of pleurisy. In one patient the first x ray was normal and in two it showed minor changes which had cleared by the time of the second film. Four patients had metastases at the time of their first attendance; three had chronic bronchitis and in two of these the symptoms of bronchitis merged imperceptibly with those of the developing carcinoma.

Carcinoma of the stomach (11 cases, table IV). Epigastric pain and vomiting were presenting symptoms in two cases, both with pre-pyloric growths; persistent pain was a first or second symptom in two who had large undifferentiated growths of the fundus. The four patients whose first symptoms were those of a general disturbance had very malignant growths and two had metastases at the time of their first attendance. In two patients the first barium meal was negative, but in one of these physical weakness prevented a complete radiological examination.

Carcinoma of the colon and rectum (12 cases, table V). Four patients presented with intermittent abdominal pain; in one of these intestinal obstruction supervened very quickly, but in three the attacks were separated by long, pain-free intervals. Bleeding from the rectum was the presenting symptom in four patients and an alteration of the bowel habit in two.

Carcinoma of the breast (10 cases). Four patients delayed seeking advice until the growth was far advanced and three of these drew attention to the tumour only when they attended for some other purpose.

Carcinoma of the cervix uteri (3 cases). In all three patients the growth was far advanced before they presented; two of them delayed seeking advice for several months after the onset of symptoms.

Carcinoma of the ovary (8 cases). Irregular uterine haemorrhage was a presenting symptom in only one patient. In the remainder the symptoms were either dyspepsia or abdominal distension; in all of them metastases were probably present at the

TABLE III
PRESENTING SYMPTOMS, X RAY FINDINGS AND PATHOLOGY IN PATIENTS WITH CARCINOMA OF LUNG.

Sex	Age	Presenting symptoms	Second symptoms	First x ray	Site and histology of tumour if known
F	72	Anorexia Pain in region of lt. scapula	—	Collapsed division of lobe	—
M†	77	Backache	—	Enlarged hilum	Oat cell carcinoma at bifurcation of lt. main bronchus
M†	67	Weakness of lt. leg	—	Hilar and lower zone opacities	—
F	64	Dyspnoea on exertion	—	Mid zone and hilar opacities	—
M	69	Cough Dyspnoea on exertion	—	Collapse with abscess formation	Squamous cell carcinoma of rt. lower lobe bronchus
M	74	Lassitude Loss of weight	—	Rounded opacity	—
M	56	Tightness in chest Wheezing: anorexia	—	Lobar collapse	Necrotic squamous cell carcinoma obstructing main bronchus
M†	72	Temporal and frontal headaches	Sciatic pains in both legs	Large well defined opacity	Anaplastic spindle cell carcinoma left main bronchus
F	73	Attack of pleurisy	Dry cough	Mid zone consolidation, hilar swelling	—

†These patients had metastases at the time of their first attendance.

TABLE III (continued)

Sex	Age	Presenting symptoms	Second symptoms	First x ray	Site and history of tumour if known
M	52	Acute bronchitis	Lassitude, occasional cough	Large well defined opacity	Squamous cell carcinoma
M	80	Haemoptysis	—	Collapsed division of lobe	—
M	59	Exhaustion after self-diagnosed influenza, vague pain in lt. u. chest	Anorexia Epigastric pain morning and evening	Normal	Oat cell carcinoma of rt. main bronchus near carina
M	51	Lassitude, loss of weight, vomiting	—	Large hilar opacity	Mixed cell carcinoma lt. main bronchus
M	61	Request for x ray No symptoms reported	—	Basal consolidation	—
M*	60	Anorexia Lump on chest wall	—	Upper zone opacity	—
M	70	Palpitations and dyspnoea, nausea, malaise, flatulence	Feeling "awful" Loss of interest in life	Hilar opacity	—
M	52	Wheezing Dyspnoea on cycling	—	Patchy consolidation: transient	Oat cell carcinoma involving oesophagus
M†	52	Cough for 3 weeks	Haemoptysis	Opacity in lower zone: transient	Squamous cell carcinoma of rt. lower lobe

*This patient had metastases at the time of first visit.

†This patient was diagnosed in 1956 and does not appear in table I.

TABLE IV
PRESENTING SYMPTOMS, X RAY FINDINGS AND PATHOLOGY IN PATIENTS WITH GASTRIC CARCINOMA

Sex	Age	Presenting symptoms	Second symptoms	x ray	Site and histology of tumour if known
F	68	Epigastric pain, anorexia, vomiting	—	Carcinoma	Adenocarcinoma of pre-pyloric antrum
M	74	Haematemesis	—	Carcinoma	—
M	75	Failure to recover fully after fractured femur	—	Refused	—
M†	57	Anorexia, fainting, loss of weight	—	—	Carcinoma of cardia
F†*	74	Lassitude Low backache	—	Normal	Ulcerated carcinoma
M	80	Malaise	—	Refused	Signet ring cell carcinoma infiltrating whole of stomach wall
M	60	Giddy turns	Bad taste in mouth, anorexia, ache in lt. mammary region	Hiatus hernia	Large carcinoma of fundus
F	66	Epigastric pain after meals, vomiting, constipation	—	Carcinoma	Squamous cell carcinoma of pre-pyloric antrum
M	61	Continuous dull pain in epigastrium	—	Carcinoma	Large carcinoma of fundus
M	64	Melaena	—	Carcinoma	Large ulcer carcinoma of body of stomach

†These patients had metastases at the time of their first attendance.

*Poor general condition made full radiological examination impossible.

TABLE V
PRESENTING SYMPTOMS AND PATHOLOGY IN PATIENTS WITH CARCINOMA OF THE COLON.

<i>Sex</i>	<i>Age</i>	<i>Presenting symptoms</i>	<i>Site and type of tumour if known</i>
M*	42	Intermittent abdominal pain after meals, occasional vomiting	Carcinoma of hepatic flexure
F*	49	Attacks of central abdominal pain	Ring carcinoma of descending colon
M	69	Rectal bleeding	Lower sigmoid carcinoma
M	81	Mucoid rectal discharge	Well differentiated adenocarcinoma of rectum
F	74	Abdominal pain	Adenocarcinoma of sigmoid
M	70	Rectal bleeding	Adenocarcinoma of rectum
M	80	Diarrhoea	Adenocarcinoma of sigmoid
F	79	Central abdominal pain	Ring carcinoma of ascending colon
M	73	Abdominal pain, vomiting, loss of weight	Mucus secreting adenocarcinoma of caecum
F	80	Rectal bleeding	—
M	45	Urge to defaecate with feeling of incomplete evacuation	Well differentiated adenocarcinoma of rectum
F	64	Rectal bleeding	Adenocarcinoma at recto-sigmoid junction

*These patients were diagnosed before 1957 and do not appear in table I.

first attendance.

Brain tumours (4 cases). One patient, with a colloid cyst of the IIIrd ventricle, was seen for the first time in coma: he had suffered from paroxysmal headaches for months without seeking advice. One presented with vomiting and dementia, and another with Jacksonian attacks. The fourth had an auditory neuroma and first complained of "swimmy feelings".

Discussion

This group of cases may serve to underline two facts about cancer which are sometimes overlooked when statistics are treated too superficially. The first is that cancer, compared with degenerative, infectious, traumatic, and psychogenic disorders, is an uncommon cause of illness. If our experience is typical, a practitioner with 2,500 patients will see new cases of cancer with approximately the following frequency: cancer of the lung, once a year; of the stomach, colon, skin, and breast, once each in eighteen months; of the ovary, once in two years; and of the cervix, prostate, brain, and thyroid, once each in four years.

The second fact is that cancer is largely a disease of the elderly. Alarm at the high and rising mortality from cancer should be tempered by the knowledge that a large number of those dying from it have long passed the age of seventy. As Smithers (1960) has pointed out, the position is not nearly so alarming as it appears to be; with the exception of a large increase in lung cancer and smaller increases in cancer of the kidney, brain, and blood, the age-corrected incidence of cancer has declined steadily throughout this century.

This must not, of course, blind us to the fact that cancer is the cause of much suffering and premature death. Some of this can be prevented by early diagnosis and treatment: how much, it is impossible to say; but, as Sutherland (1960) has observed, the patients who will benefit by early diagnosis can be discerned only in retrospect, and an effort must therefore be made in all patients to detect cancer at the earliest possible time.

There are three ways of achieving earlier diagnosis: education of the public, the periodic examination of healthy persons, and improvement in our own diagnostic methods. The relative value of these measures varies with the site of the cancer: education of the public, for instance, is unlikely to be of value in tumours with a varied symptomatology—such as those of the lung and stomach—but might be helpful in tumours of the breast and uterus, where so much depends on the patient seeking early advice. As Paterson and Aitken-Swan have demonstrated, and as this paper confirms, ignorance and fear commonly cause women with these tumours

to delay visiting the doctor (Paterson and Aitken-Swan, 1954; Aitken-Swan and Paterson, 1955). For most internal tumours, the results of cancer detection surveys are disappointing. Carcinoma of the cervix uteri is, however, an exception; Boyes *et al.* (1962) have demonstrated how carcinoma *in situ* can be detected and treated in a large population, and how this leads to a decline in the incidence of carcinoma of the cervix. There seems to be no good reason why this service should not be offered to every woman in this country.

For the three large groups of internal cancer (lung, stomach, and colon) the best hope of cure for most patients is still an early diagnosis by the family doctor. The starting point for discussions on cancer diagnosis in general practice must always be the comparative rarity of the disease. The family doctor's problem is how to select, from the mass of material which confronts him, the patients who need further investigation; it can only be solved by close study of the early symptoms of cancer, by careful and repeated observation of each patient in the early period of the illness, and by clear thinking on the indications for radiology and other special procedures. Each site presents problems of its own.

The lung. It is surprising to find that cough and haemoptysis are such uncommon presenting symptoms in this series. They are generally believed to be common: one widely read modern text book states: "Cough is the most common early symptom . . ." (Davidson, 1960). What is the reason for this difference? It may be significant that none of the patients with anaplastic tumours presented with a cough, but that cough was a presenting or second symptom in three of the four patients with squamous-cell tumours. This suggests that cough may only be a presenting symptom in the more slowly growing tumours; whether this observation is significant could only be discovered by a more extensive study in general practice. It is possible that the recent increase in lung cancer has been more in the anaplastic than in the squamous cell types, and that cough is now a less common presenting symptom than it used to be.

It is evident from this paper that a very wide range of symptoms should suggest lung cancer to the family doctor. Physical signs are of little help, so he has no alternative but to x ray large numbers of patients. Experience suggests that any middle-aged man with the following complaints should be x rayed:

Bronchitis, pneumonia, or pleurisy
Shortness of breath or wheezing
Vague chest pain
Cough of more than 3 week's duration
Alteration in character of a chronic cough
Anorexia or persistent dyspepsia

Haemoptysis
Lassitude or loss of weight

If x-rays were used on this scale, and as soon as suspicious symptoms were reported, the five year cure rate for patients diagnosed in general practice would probably equal that in patients diagnosed by mass radiography.

A chest x ray must not be regarded as the final arbiter: so many of them are normal, or show only transient opacities, that a careful follow-up is essential. Other diagnostic measures may be necessary, even in the presence of a normal x ray.

The stomach. Barium meals cannot be ordered like chest x rays. To send every patient with more than transient dyspepsia to the radiologist would be to inundate him with unnecessary work. Which patients are to be selected for radiology? There are some absolute indications: haematemesis and melaena, vomiting after food, or symptoms of peptic ulcer arising in middle age, to give some examples. There remain, however, a whole host of patients with more insidious symptoms, any of whom may have an early carcinoma. These should have a careful clinical assessment, with frequent follow-up examinations and regular weighing; persistence or progression of symptoms, loss of weight, hypochromic anaemia, or occult blood in the stools are indications for a barium meal.

A number of first barium meals are negative for carcinoma, especially when the growth is in the fundus: the proportion is found by various authors to be between ten and thirty per cent (Cooper, 1941; Anglem, 1946; Engel, 1947; Harnett, 1947). A barium meal is therefore, no substitute for a clinical follow-up.

The colon and rectum. The patients in this series illustrate the main presenting symptoms: rectal bleeding, alteration of bowel habit, and abdominal pain. Rectal bleeding is common in general practice and most cases are due to haemorrhoids: however, it is never safe to assume this on the strength of a negative rectal examination, and the family doctor has no alternative but to arrange a sigmoidoscopy in all cases. The fact that bleeding has occurred only once is no guarantee that all is well. Bowel disorders are also very common and patients have to be carefully selected for radiology. The important symptom is a recent change in the patient's usual bowel habit.

Abdominal pain is undoubtedly the most difficult symptom to interpret. At the onset there may be long intervals between attacks and gastritis, enteritis or peptic ulcer may be simulated. Any middle-aged patient who has an attack of abdominal pain should be followed up; a recurrence of pain, or loss of weight, are indications for further investigation. As with barium meals, a negative barium enema does not entirely exclude a carcinoma and

clinical follow-up is essential.

Summary

Five years experience of cancer in general practice is described. Compared with degenerative, traumatic, infective, and psychogenic diseases, cancer is an uncommon cause of illness. A large number of patients with cancer are over the age of 70; in this group the proportion was 43 per cent.

The early symptoms of the patients with cancer of the lung, stomach, colon, ovary, and brain are described. Contrary to the widely held view, cough was an uncommon presenting symptom in the patients with cancer of the lung. This may be due to an increasing number of anaplastic carcinomas.

Measures for achieving early diagnosis of cancer are advocated. Among these are:

1. The large scale use of chest x rays for middle-aged men with symptoms suggesting lung cancer.
2. Careful clinical selection of patients with dyspepsia or abdominal pain for further examination by barium meal or enema.
3. Sigmoidoscopy for all patients with rectal bleeding.
4. Routine examinations of women for carcinoma *in situ* of the uterine cervix.

Attention is drawn to the frequency of normal appearances and transient abnormalities in first x rays for carcinoma of the lung; also to the fact that radiological findings may be normal in the early stages of gastric and colonic tumours. The importance of a clinical follow-up of all patients after x ray is emphasized.

Acknowledgments

I wish to thank Dr S. R. F. Whittaker for reading the manuscript and giving much valuable advice. I am most grateful to my partners, Dr A. R. McWhinney, Dr D. Ferguson and Dr H. G. Nicol for allowing me to use their case records and for their interest and co-operation. I acknowledge gratefully the help of Mr R. A. Abbey Smith, Dr P. G. Arblaster, Dr T. W. Backhouse and Mr D. P. Marks; of Mr R. V. Nellthorp and the staff of the Warwickshire Executive Council; of Miss P. D. M. Smallwood and the staff of the records department, Stratford-on-Avon Hospital; of Mrs K. Britten at the records department, Warwick Hospital; and of Mrs D. M. J. Shelton-Rayner for her secretarial work. Finally, I wish to thank the physicians, surgeons, pathologists, and radiologists of the South Warwickshire Hospitals Group, who were concerned in the diagnosis and treatment of a large proportion of these patients.

REFERENCES

- Aitken-Swan, J., Paterson, R. (1955). *Brit. med. J.*, **1**, 623.
 Anglem, T. J. (1946). *New Engl. J. Med.*, **235**, 322.
 Boyes, D. A., Fidler, H. K., Lock, D. R. (1962). *Brit. med. J.*, **1**, 623.
 Cooper, W. A. (1941). *J. nat. Cancer Inst.*, **2**, 85.
 Davidson, Sir S., *Principles and Practice of Medicine*. Edinburgh, 1960.
 Engel, G. C. (1947). *J. Amer. med. Ass.*, **135**, 687.
 Harnett, W. L. (1947). *Brit. J. Surg.*, **34**, 379.
 Paterson, R., Aitken-Swan, J. (1954). *Lancet*, **2**, 857.
 Smithers, D. W., *A Clinical Prospect of the Cancer Problem*. Edinburgh, 1960.
 Sutherland, R., *Cancer. The Significance of Delay*. London, 1960.
 Weaver, E. J. M., Balme, R. H. (1960). *Brit. med. J.*, **1**, 1543.