Pancreatic cancer in England and Wales: surgeons look at epidemiology

T G ALLEN-MERSH MD FRCS
Senior Registrar
R J EARLAM MChIR FRCS
Consultant Surgeon
The London Hospital, London

Key words: CARCINOMA PANCREAS, EPIDEMIOLOGY, SURGERY

Summary
Five thousand eight hundred and eighty one cases of pancreatic cancer and 126 cases of ampullary carcinoma were registered in England and Wales in 1979. Forty four per cent of men and 59% of women were aged 70 or over at the time of presentation. Sixty six per cent did not undergo a surgical operation. One thousand seven hundred had a bypass operation for relief of jaundice (34%) and 470 underwent gastrojejunostomy for pyloric obstruction (8%). Only 200 pancreatic resections were performed (3%). Ten per cent of all the patients survived for one year and less than 3% for five years. Most of the long term survivors at five years after pancreatic resection had carcinoma of the ampulla of Vater.

Introduction
The purpose of this study was to review the incidence, prevalence, survival and mortality of pancreatic cancer utilising the epidemiological data routinely published by the Office of Population Censuses and Surveys (OPCS) (1) and to relate these data to those collected by Hospital Activity Analysis (HAA) and produced as the Hospital In-Patient Enquiry (HIPE) for operation in England and Wales (2), as well as the cancer mortality figures collected nationally (3). These sources are available to any clinician so the figures are not new, but the approach is original in that it seeks to correlate the incidence of surgical operations with the incidence of the disease. Such data do not enable a surgeon to discover what is the best treatment, but merely demonstrate what is going on in England and Wales at the moment. It is hoped that this approach will enable logical criticisms to be made of present practice and point to advances or improvements. Further data from the literature have been added when epidemiological sources are insufficient to complete the clinical picture. Additional details about the modes of presentation and investigation of early disease are essential for consideration of a possible screening programme and of whether to use expensive tests to investigate vague symptoms with the objective of identifying resectable disease. The value of such tests and a screening programme can be assessed only when the incidence and prevalence of the pathology to be identified are known. An awareness of this epidemiology might improve clinical decision taking in the management of pancreatic cancer, and is essential when measuring the sensitivity and specificity of investigations.

Mortality, registration and survival
In 1982 there were 5,720 deaths from pancreatic cancer in England and Wales (population 49.1 million); 51% (2,898) of these were males. There has been a progressive rise in the mortality rate in England and Wales during the last 70 years (Fig. 1). A similar increase in mortality rate has been reported in other countries since 1955 (Fig. 2). Death rates are highest in Sweden but England, Wales and Scotland are among the top five (4). In 1979 there were 5881 patients registered with pancreatic cancer in England and Wales with a rate per 100,000 of 12.8 for males and 11.2 for females. Registration of new cases of pancreatic cancer between 1962 and 1970 was probably underestimated because more patients were recorded as dying from the disease than were registered during that period, but in the last ten years registration and mortality have almost equalised. The median age at presentation was between 65 and 70 years; 44% of men and 59% of women were aged more than 70 years at the time of registration (Fig. 3). Although the number of deaths in men is similar to that in women, the age-adjusted death rate is higher in men because the disease tends to occur earlier in men (median age 60-70 years) than in women (median age 70-80 years). Survival data published by the OPCS (5) shows that about 10% of all

Correspondence to: R J Earlam MChIR FRCS, Consultant Surgeon, The London Hospital, Whitechapel, London E11BB.
pancreatic cancer patients are alive at one year, 3% at three years and less than 3% at five years. Although figures for the prevalence of pancreatic cancer can be calculated, for practical purposes the numbers for registration, incidence, prevalence and mortality are all depressingly similar.

Site of tumour
The site of malignant neoplasms in the pancreas is recorded by the Cancer Registry using the International Classification of Disease (ICD) coding. The total number of tumours (5881) arising in different areas of the pancreas registered in 1979 is shown in the Table. Neoplasms of the ampulla of Vater have a different ICD code but have been included because they are usually grouped together by clinicians. The number of ampullary neoplasms registered in 1979 was 126.

A limitation of the epidemiological data is that the site of origin of the tumour within the pancreas was unknown in 2,489 (42%) of the cases of pancreatic cancer registered in 1979 (1). The distribution of unspecified cancers was probably not the same as of those specified, which had a ratio of 3 head and neck to 1 body and tail. It is likely that a greater proportion of unspecified tumours arose from the body or tail of the pancreas, because tumours of these sites present later in the natural history of the disease by which time it is more difficult to identify the site of origin. Studies (6) carried out in centres where the pancreas has been examined in detail suggest that about two thirds of all pancreatic tumours arise within the head and neck of the
Pancakes and one third in the body and tail, when ampullary and bile duct cancers have been excluded. The mean weight of the head and neck of the normal pancreas is 38 grams and that of the body and tail is 44 grams (6). Adjusting for these different sizes the incidence of carcinoma should be about twice as great in the head and neck as in the body and tail of the pancreas. If the site of origin were to be specified in all cases registered a ratio of 2 head and neck to 1 body and tail would be expected.

Stage of disease at presentation
The classification used in the American National Cancer Institute Third National Survey of Cancer is (7);

Stage I Localised, cancer confined to the pancreatic region
Stage II Regional lymph nodes involved
Stage III Distant spread beyond the pancreas and regional lymph nodes

It has been suggested that the TNM classification could be used:

T1 No direct extension of the primary tumour beyond the pancreas
T2 Limited direct extension to duodenum, bile duct, or stomach
T3 Advanced direct extension, incompatible with surgical resection
TX Direct extension not assessed
N0 Regional lymph nodes not involved
N1 Regional lymph nodes involved
NX Regional lymph nodes not assessed
M0 No distant metastasis
M1 Distant metastasis present
MX Distant metastasis not assessed

This has not yet been officially adopted by the Union Internationale Contre Cancer (UICC) in the TNM classification booklet revised in 1982.

Details of the stage of disease at presentation are not always recorded by the Cancer Registry and staging by operation is rare because pancreatic resections are seldom performed. However from one study of a selected group of patients who underwent resection, lymph node involvement was present locally in 88% and regionally in 33% of cases (8). Out of an unselected group of patients, where the majority have unresectable disease, the prevalence of lymph node involvement would be higher. It can be assumed that at least 85% of patients with pancreatic cancer have Stage II or III disease at the time of presentation and only a minority, of 15% or less, have Stage I disease. In overall numbers, approximately 800 patients (15% of all cases of pancreatic carcinoma) may have had Stage I tumours in 1979, but only 200 patients underwent resection. The discrepancy may be because about half of the Stage I patients were deemed unfit for resection due to their general physical condition and age, even if technically resectable.

Clinical presentation
The average delay between onset of symptoms and presentation is about six months (9,10,11). Classically, pain and jaundice are said to be the first symptoms but nowadays these might be considered late symptoms because investigations can demonstrate the disease at an earlier stage when the tumour is smaller. The early symptoms (12) of carcinoma of the head of the pancreas are non-specific: weight loss 80%, tiredness and malaise 42%, change in bowel habit 41%, diabetes mellitus 33% and upper abdominal discomfort 33%. Jaundice (89%) and pain (71%) are late symptoms. Carcinoma of the body and tail of the pancreas presents with even more vague symptoms. It is not true that carcinoma of the ampulla of Vater is invariably associated with obstructive jaundice; jaundice is the initial complaint in less than half of the patients with ampullary carcinoma (9,10).

Pathology
The majority of pancreatic neoplasms are exocrine in origin and morphologically resemble the pancreatic ductal cell. Only 0.1% of all malignant pancreatic neoplasms registered in England and Wales in 1979 were endocrine in origin (Table). Details of the pathological type of pancreatic neoplasms are not recorded by the Cancer Registry so figures must be obtained from the literature. The most common type is duct cell adenocarcinoma (75%) and the remaining subgroups each make up less than 5% of the total (13). The degree of differentiation does not correlate with tumour diameter, tumour extension, metastases, operability or survival (12). Tumours less than 3cm in diameter are usually resectable, even though many have vascular involvement; but tumours over 8cm are almost always inoperable (12).

Surgical treatment
Thirty four per cent (15,790/46,888) of the occasions when patients were admitted to hospital with pancreatic cancer in England and Wales between 1970 and 1979 resulted in surgery (2). The majority of patients with pancreatic cancer do not undergo operation and perhaps cannot be helped by surgery. This may be due to the late stage of the disease at presentation but also may be due to the general condition of the patient which is poor. Forty five per cent of the men and 59% of the women were aged more than 70; 12% of the men and 23% of the women were over 80. The risks of surgery in such elderly patients were probably considered to outweigh the potential benefits. Ninety five per cent of the operations were biliary bypass for relief of jaundice and 5% were pancreatic resections. During this period there has been a small increase in the number of patients undergoing pancreatic resection, but the proportion of all registered cases of pancreatic carcinoma undergoing a bypass for jaundice has remained constant at about 30%. There is a wide discrepancy between the 80% or more who can be assumed to have had jaundice as a late symptom and the 30% who undergo surgery to relieve it. Are all jaundiced patients being offered relief? Are many unfit for surgery? Is the jaundice due to hepatic metastases and not obstruction? Do some clinicians think relief is not worthwhile? These questions cannot be answered from the present data.

In 1979, 1700 bypass operations for jaundice and 200 pancreatic resections were performed (2). In the same year 470 patients with pancreatic carcinoma also underwent gastrojejunostomy. This represents 8% of all cases of pancreatic carcinoma but 27% of those patients undergoing biliary bypass. It is not possible from the data available to state whether the gastrojejunostomy was carried out as a primary procedure at the same time as the biliary bypass or later as a secondary procedure once duodenal obstruction had subsequently developed.

The figures suggest that duodenal bypass was not always essential otherwise the number of gastrojejunostomies would have nearly equalled the number of biliary bypass operations. The figure of 470 operations comprises those which were essential for obstruction and those which were done in anticipation but might not have been necessary. In the literature, in one study of 8,000 unresectable pancreatic carcinoma patients (14) it was found that, in 16 out of the 24 series reviewed, the reoperation rate to relieve duodenal obstruction was more than 20%. This data does not help the surgeon to make the decision whether or not to do a prophylactic gastrojejunostomy at the time of the biliary bypass in the absence of gastric or duodenal obstruction, but it does suggest that duodenal bypass is not necessary in every patient.

Survival after surgery
The hospital mortality for pancreatic cancer treated by bypass surgery (20%) was higher than after pancreatic
clerk, the cancer registration secretary and the administrators. The basic system of collecting data must be SH3 and "Korncr" based, compatible with all central Regional Systems. But the collecting and coding must be returned to the consultant's secretary who types all discharge summaries and letters to general practitioners. In efficient units these summaries are typed within the week of discharge from hospital. There can be delays of up to six months before summaries arrive at the hospital HAA coding clerk's office, due to disinterested clinicians, lack of secretarial staff, lost notes, delay in transfer, idleness and incompetence. The discharge summary is the basis of coding and must be written clearly for clerks to code. Many registrars seem to have forgotten the etymological derivation of the word which describes their hospital position. Registering the patient, his disease and treatment both for the hospital coding and the general practitioners' information is part of a registrar's registration, with the guidance and control of the consultant. The consultant for his part, having read this article, should search out and consult with the HAA coding clerk of his hospital. She will never before have seen a consultant and may have several helpful suggestions!

The word processor and desk top computer are the key to the future. There is already one system of automatic encoding, using the American College of Pathologists Systematised Nomenclature of Disease (SNOMED), available for a personal computer, which is efficient, provided that the data produced can be picked up by a hospital mainframe computer. This standardised data on every patient could be used, a) for immediate analysis by the individual consultant, b) by the ward clerk for filling in SH3 forms, c) the HAA clerk for coding inpatient events, d) cancer registration and e) cancer treatment registration.

We are greatly indebted to Mrs Janet Pritchard, Office of Population, Censuses and Surveys for her help in obtaining the information contained in the Cancer Registry and HAA.

References