The Prognostic Factors of Pancreatic Cancer Can be Different according to Clinical Stages

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Background/Aims: The prognosis of patients with pancreatic cancer remains very poor. Although many studies have evaluated the prognostic factors of pancreatic cancer, their results are inconclusive because of different inclusion criteria, tumor stages, and treatment modalities. This large scale retrospective analysis was performed to assess whether active treatment of pancreatic cancer, even in its advanced stage, could improve patients’ survival. In addition, we sought to identify factors associated with favorable prognosis of pancreatic cancer.

Methods: Between 1994 and 2004, a total of 971 patients with pancreatic cancer were treated at Asan Medical Center. The patients were classified into three groups according to clinical stages: resectable (RE, n=226), locally advanced (LA, n=409), and far advanced (FA, n=336). Treatment response and prognostic factors for survival were analyzed in each group. Results: Compared to supportive care, active treatment significantly increased the median survival time in all groups (RE: 18.0 vs. 9.0 months; LA: 10.0 vs. 7.0 months; FA: 5.0 vs. 3.0 months). Multivariate analysis showed that prognostic factors for survival differed according to clinical stages. In the RE group, unfavorable prognostic factors were high CA 19-9, poor histologic differentiation, large tumor size, and regional lymph node involvement. In the FA group, however, poor outcomes were associated with old age, poor performance status, and hypoalbuminemia. Conclusions: More active treatment of pancreatic cancer, even in advanced stage, can make a significant difference in terms of patient’s survival. The prognosis of resectable pancreatic cancer is dependent on tumor-related factors, while the prognosis of patients with far advanced pancreatic cancer is dependent on patient-related factors. (Korean J Gastroenterol 2008;51:181-189)

Key Words: Pancreatic cancer; Prognostic factors; Survival
Introduction

The prognosis of patients with pancreatic adenocarcinoma continues to be poor. In Korea, pancreatic cancer is the fifth leading cause of cancer deaths, and its incidence is increasing. The lethality of this malignancy is demonstrated by the fact that its annual incidence is approximately equal to the annual number of deaths. Nonspecificity of clinical symptoms, high incidence of metastatic diseases at the time of diagnosis, and lack of effective systemic therapy can explain the poor prognosis. Surgical resection offers the only potential cure for pancreatic cancer. Unfortunately, only 10% to 15% of patients are eligible for margin-negative surgical resection, which confers a 5-year overall survival rate of 15% to 25%. At the time of presentation, about 40% to 45% of patients with pancreatic cancer have radiologically detectable metastatic disease, and the remaining 45% to 50% have locally advanced disease which is not amenable to surgical resection.

Although many studies have evaluated the prognostic factors for patients with pancreatic cancer, their results are inconclusive because of different inclusion criteria, tumor stages, and treatment modalities. Therefore, the findings of each study may not simultaneously be applicable to patients with obvious metastases and to patients with resectable disease.

In most tumors, including pancreatic cancer, the TNM staging is helpful in determining the prognosis. However, for treatment purposes, most clinicians prefer a clinical staging system based on whether the disease is (1) resectable (RE), (2) locally advanced (LA), or (3) far advanced (FA). We, therefore, retrospectively assessed the mortality rate in a large cohort of patients with pancreatic cancer. We also assessed whether active treatment of pancreatic cancer, even in its advanced stage, could improve survival, and attempted to identify factors associated with more favorable prognosis.

Materials and Methods

1. Patients

The medical records of all 971 patients with pancreatic cancer who were treated at our institution between January 1994 and January 2004 were retrospectively reviewed. Pancreatic cancer was diagnosed surgically, radiologically, and/or endoscopically. Patients who underwent surgery were diagnosed and staged pathologically, whereas radiologic imaging along with clinical follow-up were used for the diagnosis and staging of inoperable patients. Only patients with ductal adenocarcinoma were included, if they were assessed by histopathologically. Patients were staged into RE, LA, and FA groups according to clinical staging system, as described previously. RE disease is defined as in which complete surgical excision is possible. LA disease refers to pancreatic cancer which is not resectable but still appears to be localized. Local extension included the tumor invasion to nearby organs (e.g. duodenum or vascular structures such as the superior mesenteric artery and celiac axis) which cannot be resected. FA disease is defined as that have distant metastasis, such as peritoneum and bones. Treatments included surgical resection, chemotherapy, radiotherapy, or supportive care. The type of treatment was determined according to tumor stage, performance status, and clinician’s preference. Clinical follow-up was updated as of February 1, 2007. The overall survival period was defined as the period from the diagnosis to date of death or last follow-up.

2. Methods

Recorded data included patients’ age, gender, and clinical symptoms such as pain, weight loss (>5% in 3 months), jaundice and indigestion, past history of diabetes mellitus (DM), and ECOG (Eastern Cooperative Oncology Group) performance status. Other findings included laboratory results (such as complete blood count, liver transaminases, alkaline phosphatase, albumin, total bilirubin and CA 19-9), location and size of primary tumor, and histologic differentiation. Factors were selected for the assessment on the basis of the results previously published reports. Prognostic factors were categorized as patient-related, tumor-related, and treatment-related. Patient-related factors included age, gender, performance status, hemoglobin, and serum albumin. Tumor-related factors included CA 19-9 level, tumor location and size, histologic differentiation, and involvement of regional lymph nodes (LN) or resection margins. Treatment-related factors included whether or not a patient received active treatment or postoperative adjuvant therapy.

3. Statistical analysis

Statistical analysis was performed on a desktop computer with statistical software package (SPSS for Windows V12.0, SPSS Inc., Chicago, IL, USA). Categorical values such as gender ratio and mortality were compared among groups using the chi-square test. Continuous values such as albumin and size of tumor were compared among groups using one-way ANOVA.