HOSPITAL AND MEDICAL CARE DAYS IN PANCREATIC CANCER

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INTRODUCTION

• Pancreatic cancer is currently the 4\textsuperscript{nd} leading cause of cancer deaths in the United States

• Estimated 43,140 new cases of pancreatic cancer in 2010

• Estimated 36,800 deaths from pancreatic cancer in 2010

• Overall 5-year survival for patients with pancreatic cancer is <5\%
INTRODUCTION

- Depending on the stage at presentation, physicians and patients have a wide variety of treatment options, including surgery, chemotherapy, and radiation.

- Approximately 25-30% of patients with locoregional disease undergo surgical resection:
  - Improves median survival from 6 months to 13-19 months
  - Improves overall survival from <5% to 15-20%

- Approximately 1/3 of patients with metastatic disease receive chemotherapy:
  - Improves median survival from 3-4 months to 5-7 months
INTRODUCTION

- Surgery, chemotherapy, and radiation offer limited survival benefit and significant risks
  - Surgical complications: 30-40%
  - Surgical mortality: 2-5%

- Toxicities or complications from treatment may negate the benefit of marginally prolonged survival
Introduction

• Previous studies have focused on the survival benefit of various interventions for pancreatic cancer.

• Resource utilization with regard to hospital days or days in medical care (seeing a physician, getting a test, or in the hospital) has not been well described.

• Information regarding expected hospital and medical care days may help patients and physicians when making treatment decisions.
GOAL

• Describe the total number of days in the hospital and days receiving medical care in the first year after diagnosis of adenocarcinoma of the pancreas
METHODS: PATIENTS

- Surveillance, Epidemiology, and End Results (SEER) database with linked Medicare claims
- Patients aged 66 years or older diagnosed with adenocarcinoma of the pancreas between 1992-2005
- Enrollment in Medicare Part A and Part B without HMO for 12 months before and 24 months after diagnosis or until death
METHODS: STAGING

• SEER historic stage (locoregional vs. distant disease)

• Patients with unknown stage disease (19.6%) analyzed separately, with results similar to patients with distant disease
  – Therefore, distant and unknown analyzed together

• Tumor characteristics based on the denominator of patients with data available
METHODS: HOSPITAL AND MEDICAL CARE DAYS

- Hospital and medical care days assessed by month for each patient from the date of diagnosis to one year after diagnosis

- Total days receiving any kind of medical care:
  - Physician visits (PCP, GI, oncology, surgeon)
  - Hospitalizations
  - Diagnostic or therapeutic procedures (CT, MRI, ERCP, ultrasound, biopsy, chemotherapy, radiation)

- Patients who entered hospice were censored
HOSPITAL DAYS IN PANCREATIC CANCER
METHODS: HOSPITAL AND MEDICAL CARE DAYS

• Hospital or medical care days per person-month:

  Total number of days incurred by the cohort x 30
  Total number of observation days contributed by the cohort in a month
METHODS: STATISTICAL ANALYSIS

• Summary statistics calculated for entire cohort

• Patients stratified by:
  – Stage
  – Treatment strategy (surgery vs. no for locoregional, chemotherapy vs. no for distant)
  – Duration of survival (0-3 months, 3-6 months, 6-12 months, ≥12 months)
RESULTS: PATIENT DEMOGRAPHICS

<table>
<thead>
<tr>
<th>Patient Demographics</th>
<th>N=25,476</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y), mean ± SD</td>
<td>77.6 ± 7.3</td>
</tr>
<tr>
<td>Female gender</td>
<td>14,841 (58.3%)</td>
</tr>
<tr>
<td>Race (white)</td>
<td>21,007 (82.5%)</td>
</tr>
<tr>
<td>Marital Status (married)</td>
<td>12,161 (47.7%)</td>
</tr>
<tr>
<td>% Census Tract Below Poverty Line, mean ± SD</td>
<td>11.3% ± 10.1%</td>
</tr>
<tr>
<td>Median Income of Census Tract ($), mean</td>
<td>47,548</td>
</tr>
<tr>
<td>% Census Tract with &lt;12 years Education, mean ± SD</td>
<td>19.4% ± 13.5%</td>
</tr>
</tbody>
</table>
# RESULTS: TUMOR CHARACTERISTICS

<table>
<thead>
<tr>
<th>Tumor Characteristics</th>
<th>N=25,476</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (cm), mean ± SD</td>
<td>4.3 ± 2.5</td>
</tr>
</tbody>
</table>

## Tumor Stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locoregional</td>
<td>8,152 (32.0%)</td>
</tr>
<tr>
<td>Distant</td>
<td>12,331 (48.4%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>4,993 (19.6%)</td>
</tr>
</tbody>
</table>
### RESULTS: TREATMENT

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N=25,476</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surgical Resection</strong></td>
<td></td>
</tr>
<tr>
<td>Overall (N=25,476)</td>
<td>2,328 (9.1%)</td>
</tr>
<tr>
<td>Locoregional (N=8,152)</td>
<td>1,999 (24.5%)</td>
</tr>
<tr>
<td>Distant/Unknown (N=17,324)</td>
<td>329 (1.9%)</td>
</tr>
<tr>
<td><strong>Chemotherapy</strong></td>
<td></td>
</tr>
<tr>
<td>Overall (N=25,476)</td>
<td>8,075 (31.7%)</td>
</tr>
<tr>
<td>Locoregional (N=8,152)</td>
<td>3,932 (48.2%)</td>
</tr>
<tr>
<td>Distant/Unknown (N=17,324)</td>
<td>4,143 (23.9%)</td>
</tr>
</tbody>
</table>
RESULTS: SURVIVAL HOSPITAL DAYS IN PANCREATIC CANCER

The bar chart illustrates survival rates for different stages of pancreatic cancer. The x-axis represents the stage of disease (Overall, Locoregional, Distant, Unknown), and the y-axis represents the percent surviving. The chart compares survival rates across different time periods: 0-3 months, 3-6 months, 6-12 months, and ≥12 months.
## HOSPITAL DAYS IN PANCREATIC CANCER

### RESULTS: HOSPITAL AND MEDICAL CARE DAYS IN THE OVERALL COHORT

<table>
<thead>
<tr>
<th>Month of Diagnosis</th>
<th>Number Censored</th>
<th>Number at Risk</th>
<th>Observation Days</th>
<th>Total Hospital Days</th>
<th>Total Medical Care Days</th>
<th>Hospital Days Per Person-Month</th>
<th>Medical Care Days Per Person-Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4,825</td>
<td>20,651</td>
<td>715,163</td>
<td>153,176</td>
<td>213,985</td>
<td>6.43</td>
<td>8.98</td>
</tr>
<tr>
<td>2</td>
<td>5,717</td>
<td>14,934</td>
<td>524,620</td>
<td>110,950</td>
<td>159,245</td>
<td>6.34</td>
<td>9.10</td>
</tr>
<tr>
<td>3</td>
<td>3,000</td>
<td>11,934</td>
<td>399,641</td>
<td>49,780</td>
<td>92,109</td>
<td>3.73</td>
<td>6.91</td>
</tr>
<tr>
<td>4</td>
<td>1,919</td>
<td>10,015</td>
<td>327,802</td>
<td>30,711</td>
<td>64,921</td>
<td>2.81</td>
<td>5.94</td>
</tr>
<tr>
<td>5</td>
<td>1,396</td>
<td>8,619</td>
<td>278,921</td>
<td>21,046</td>
<td>46,955</td>
<td>2.26</td>
<td>5.05</td>
</tr>
<tr>
<td>6</td>
<td>1,108</td>
<td>7,511</td>
<td>241,293</td>
<td>15,939</td>
<td>37,273</td>
<td>1.98</td>
<td>4.63</td>
</tr>
<tr>
<td>7</td>
<td>923</td>
<td>6,588</td>
<td>211,390</td>
<td>14,088</td>
<td>31,671</td>
<td>2.00</td>
<td>4.49</td>
</tr>
<tr>
<td>8</td>
<td>837</td>
<td>5,751</td>
<td>185,063</td>
<td>11,712</td>
<td>26,533</td>
<td>1.90</td>
<td>4.30</td>
</tr>
<tr>
<td>9</td>
<td>660</td>
<td>5,091</td>
<td>162,843</td>
<td>9,734</td>
<td>22,232</td>
<td>1.79</td>
<td>4.10</td>
</tr>
<tr>
<td>10</td>
<td>561</td>
<td>4,530</td>
<td>144,435</td>
<td>8,373</td>
<td>18,960</td>
<td>1.74</td>
<td>3.94</td>
</tr>
<tr>
<td>11</td>
<td>453</td>
<td>4,077</td>
<td>129,088</td>
<td>7,611</td>
<td>16,782</td>
<td>1.77</td>
<td>3.90</td>
</tr>
<tr>
<td>12</td>
<td>413</td>
<td>3,664</td>
<td>116,165</td>
<td>6,395</td>
<td>14,216</td>
<td>1.65</td>
<td>3.67</td>
</tr>
</tbody>
</table>
HOSPITAL DAYS IN PANCREATIC CANCER

RESULTS: HOSPITAL AND MEDICAL CARE DAYS IN LOCOREGIONAL PANCREATIC CANCER
RESULTS: HOSPITAL AND MEDICAL CARE DAYS IN LOCOREGIONAL PANCREATIC CANCER
RESULTS: HOSPITAL AND MEDICAL CARE
DAYS IN DISTANT PANCREATIC CANCER

<table>
<thead>
<tr>
<th>Month of Diagnosis</th>
<th>Chemotherapy (Surviving)</th>
<th>Non-Chemo (Surviving)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4871</td>
<td>12453</td>
</tr>
<tr>
<td>2</td>
<td>4736</td>
<td>8636</td>
</tr>
<tr>
<td>3</td>
<td>4163</td>
<td>4664</td>
</tr>
<tr>
<td>4</td>
<td>3498</td>
<td>3089</td>
</tr>
<tr>
<td>5</td>
<td>2937</td>
<td>2250</td>
</tr>
<tr>
<td>6</td>
<td>2456</td>
<td>1784</td>
</tr>
<tr>
<td>7</td>
<td>2118</td>
<td>1422</td>
</tr>
<tr>
<td>8</td>
<td>1799</td>
<td>1175</td>
</tr>
<tr>
<td>9</td>
<td>1524</td>
<td>970</td>
</tr>
<tr>
<td>10</td>
<td>1300</td>
<td>830</td>
</tr>
<tr>
<td>11</td>
<td>1125</td>
<td>722</td>
</tr>
<tr>
<td>12</td>
<td>976</td>
<td>629</td>
</tr>
</tbody>
</table>
RESULTS: HOSPITAL AND MEDICAL CARE DAYS IN DISTANT PANCREATIC CANCER

![Graphs showing hospital days by chemotherapy status and month of diagnosis.](image)
DISCUSSION

- Previous studies have focused almost entirely on the survival benefit of various treatment strategies.

- Our study attempts to examine two factors that impact patients’ lives after a diagnosis of pancreatic cancer: hospital days and days in medical care.

- This information may be useful in decision-making regarding various treatment strategies.
DISCUSSION

• The longer a patient survived, fewer days were spent in the hospital

• In all cases, hospital and medical care days increase at the end of life
DISCUSSION

- Patients who underwent surgical resection experienced more hospital and medical care days during the first four months after diagnosis.

- In those who survived more than 6 months, unresected patients were admitted more often at the end of life.

- Various tools are being developed to help predict which patients will survive long-term and would benefit from surgery.

- Conversely, patients who might not survive longer than a few months should perhaps be spared a morbid surgery and a high number of hospital and medical care days.
DISCUSSION

• Patients who received chemotherapy were in the hospital less often over the first three months after diagnosis, with an increase in hospital and medical care days at the end of life.

• These findings agree with our previous study, which noted an increase over time in ICU care and chemotherapy and a decrease in hospice use in patients dying of pancreatic cancer.
DISCUSSION

• Currently, there are no decision-making tools for physicians and patients with pancreatic cancer.

• For breast, colon, and lung cancer, physicians may access Adjuvant! Online for assistance in making treatment decisions.
Welcome to Adjuvant! Online

Adjuvant! Online is a decision making tool for health care professionals.

Welcome to Adjuvant! Online

The purpose of Adjuvant! Online is to help health professionals and patients with early cancer discuss the risks and benefits of getting additional therapy (adjuvant therapy, usually chemotherapy, hormone therapy, or both) after surgery.

The goal is to help health professionals make estimates of the risk of negative outcome (cancer-related mortality or relapse) without systemic adjuvant therapy, estimates of the reduction of those risks afforded by therapy, and risks of side effects of the therapy. These estimates are based on information entered about individual patients and their tumors (for example, patient age, tumor size, nodal involvement, histologic grade, etc.). These estimates are then provided on printed charts in simple graphical and text formats to be used in consultations.

Because of the complexity of interpretation of some of the input information (ambiguities about tumor size, margins, etc.), the information should be entered by a health professional with some experience in oncology (cancer medicine).
HOSPITAL DAYS IN PANCREATIC CANCER

ADJUVANT ONLINE

• Available for breast, colon, and lung cancers

• Allows physicians to enter information regarding:
  • Age
  • Sex
  • Comorbidities
  • Size/depth of invasion
  • Lymph node status
  • Histologic grade

• Gives information regarding:
  • Stage
  • 5-year mortality
  • Cancer-related mortality
  • Risk reduction with additional therapies
Our challenge is to provide pancreatic cancer patients meaningful data upon which treatment decisions can be made.

Patients should be made aware of potential treatment toxicities and complications and predicted survival.

The information from this study can guide patients with pancreatic cancer and their families and physicians in making personalized treatment decisions based on their individual preferences.
DISCUSSION

• Hospice care improves symptom management and quality of life for patients at the end of life.

• Patients with pancreatic cancer have been shown to have improved survival when enrolled in hospice.

• Currently, hospice is underutilized in patients with pancreatic cancer.

• For some patients, early enrollment in hospice may be preferred over aggressive, and possibly futile care with associated risks.
HOSPITAL DAYS IN PANCREATIC CANCER

LIMITATIONS

• Patients censored when they died or entered hospice
  – Did not take into account patients that entered then subsequently withdrew

• Day of diagnosis designated as the first day of the SEER month of diagnosis
  – Overestimate the number of observed days
  – Underestimate the number of hospital days per month for the first month
  – Not an issue for every month thereafter
LIMITATIONS

• Selection bias
  – Patients who are more fit for aggressive therapy are more likely to be offered therapy
  – Improved survival is likely a combination of treatment and healthier baseline status of treated patients

• This descriptive study likely accurately reflects real-life decision-making by physicians
CONCLUSION

• The goal in the treatment of pancreatic cancer should be to balance the quality and quantity of life according to individual preferences.

• Our study is the first to use national, administrative data to quantify hospital and medical care days in patients with pancreatic cancer.

• This information, in combination with specific patient preferences and predicted survival, can help patients with pancreatic cancer make individualized treatment decisions to maximize their quantity and quality of life.
Questions?
THANK YOU!

Daniel W. Branch, M.S.
Kristin M. Sheffield, Ph.D.
Yimei Han, M.S.
Yong-Fang Kuo, Ph.D.
James S. Goodwin, M.D.
Taylor S. Riall, M.D., Ph.D.