THE SURVIVORSHIP EXPERIENCE IN PANCREATIC CANCER

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OBJECTIVES

• Define survivorship and its clinical implications in patients with pancreatic cancer

• Present our research project proposal regarding the survivorship experience in patients with pancreatic cancer

• Present our data analysis thus far
OBJECTIVES

• Obtain feedback and suggestions for project

• Set the stage for further studies across a variety of cancers using Texas Medicare data
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 <4\%
• 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

• 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
BACKGROUND

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

• Studies regarding the quality of life, comparative effectiveness, and toxicities after specific interventions for pancreatic cancer are lacking
BACKGROUND

• Specifically, population-based, administrative data have not been used to study quality of life.

• Quality of life cannot be measured directly.

• Quality of the survivorship experience (from diagnosis to death) can be described using a variety of surrogate measures that can be obtained from administrative data.
GOALS

• Describe the survivorship experience in pancreatic cancer by using four main outcomes:
  – Number of hospital days
  – Number of days with symptoms severe enough to warrant outpatient physician visits
  – Number of days receiving chemotherapy and/or radiation
  – Survival

• Examine the survivorship experience in pancreatic cancer in regards to:
  – Length of survival
  – Treatment strategy
  – Age at diagnosis
  – Stage
GOALS

• To describe end-of-life care for patients with pancreatic cancer
  – Healthcare utilization in last 1 month of life
  – Hospice enrollment and duration
  – Aggressive care in last 1 month of life

• To evaluate the comparative effectiveness of different treatment strategies on specific survivorship outcomes
Welcome to Adjuvant! Online

Adjuvant! Online
Decision making tools for health care professionals

Welcome to Adjuvant! Online

The purpose of Adjuvant! 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 these 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 sheets 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).
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
GOALS: CLINICAL IMPLICATIONS

• Develop a decision-making tool for patients with pancreatic cancer, their families, and physicians
  – “How many physician visits, acute care hospitalizations, hospital days, etc, with specific symptoms can a patient diagnosed with pancreatic cancer expect to experience?”
  – “How does this differ with stage at presentation?”
  – “How does this differ by treatment modality?”
  – “If a patient with pancreatic cancer survives more than a year after surgery, how will his or her first year compare to patients who did not have surgery?”
  – “How will this patient’s survival after the first year compare to age-matched controls without pancreatic cancer?”
METHODS

• SEER-Medicare Linked Data Project (SMLDP)
• UTMB IRB Approval
• UTMB SEER-Medicare Data Use Agreement
• Relevant Files Included:
  – Patient Entitlement and Diagnosis Summary File (PEDSF)
  – Outpatient Claims Files
  – Carrier Files
  – Home Health Agency (HHA)
  – Hospice Files
  – Hospital File
METHODS

• **Inclusion criteria:**
  – Pancreatic cancer based on ICD-O-3 Histology codes
  – Patients diagnosed between 1992-2005
  – First primary cancer only
  – Age $\geq 66$ years
  – Medicare Part A and Part B without HMO for 12 months before cancer diagnosis
  – Medicare Part A and Part B without HMO for 24 months after cancer diagnosis or until death

• **Exclusion criteria:**
  – Cases with autopsy or death certificate only as reporting sources
RESULTS: PATIENT DEMOGRAPHICS

• Age at Diagnosis
  – N=25,476
  – Mean age=77 years

• Gender
  – Male=10,637 (41.75%)
  – Female=14,841 (58.25%)

• Race
  – White=21,007 (82.45%)
  – Black=2,533 (9.94%)
  – Hispanic=419 (1.64%)
  – Other=1,399 (5.49%)
RESULTS: PATIENT DEMOGRAPHICS

• Marital Status
  – Single=1,935 (7.59%)
  – Married=12,161 (47.73%)
  – Divorced=1,506 (5.91%)
  – Widowed=8,933 (35.06%)
RESULTS: PATIENT DEMOGRAPHICS

- SEER Region
  - Atlanta (3.66%)
  - Connecticut (10.13%)
  - Detroit (11.67%)
  - Greater California (10.69%)
  - Hawaii (1.98%)
  - Iowa (9.54%)
  - Kentucky (4.44%)
  - Los Angeles (10.75%)
  - Louisiana (4.84%)
  - New Jersey (10.11%)
  - New Mexico (3.14%)
  - Rural Georgia (0.32%)
  - San Francisco (5.19%)
  - San Jose (3.30%)
  - Seattle (7.16%)
  - Utah (3.08%)
RESULTS: PATIENT DEMOGRAPHICS

- Percent Census Tract Below Poverty Line*
  - N=25,356
  - Mean=11.34%

- Median Income of Census Tract*
  - N=25,358
  - Mean=$47,548.44

- Percent Census Tract with <12 years Education*
  - N=25,358
  - Mean=19.44%

*Will be examined by quartiles
RESULTS: TUMOR CHARACTERISTICS

• SEER Historic Stage
  – Localized=8.46%
  – Regional=23.54%
  – Distant=48.40%
  – Unknown=19.60%

• Tumor Size
  – N=11,989
  – Mean=4.33cm
RESULTS: TUMOR CHARACTERISTICS

• Lymph Node Status
  – Lymph Nodes sampled (N=3,330, 13.07% of entire cohort):
    • Positive=1,904 (57.18% of those with LN sampled, 7.47% of entire cohort)
    • Negative=1,426 (42.82% of those with LN sampled, 5.60% of entire cohort)
  – No Lymph Nodes sampled=20,777 (81.56% of entire cohort)
  – Unknown Nodal Status=1,369 (5.37% of entire cohort)
RESULTS: TUMOR CHARACTERISTICS

- Lymph Node Status in Locoregional Disease
  - Locoregional Disease with Known Lymph Node Status (N=2,593)
    - Positive=1,460 (56.31%)
    - Negative=1,133 (43.69%)
  - Lymph Node Status after Surgical Resection for Locoregional Disease (N=1,860)
    - Positive=1,067 (57.37%)
    - Negative=793 (42.63%)
  - Lymph Node Status without Surgical Resection for Locoregional Disease (N=733)
    - Positive=393 (53.62%)
    - Negative=340 (46.38%)
RESULTS: TREATMENT

• Surgical Resection
  – Overall cohort (N=25,476):
    • Resected=2,328 (9.14%)
    • Unresected=23,148 (90.86%)
  – Locoregional disease only (N=8,152):
    • Resected=1,999 (24.52%)
    • Unresected=6,153 (75.48%)
RESULTS: TREATMENT

• Chemotherapy
  – Overall cohort (N=25,476):
    • Chemotherapy=8,075 (31.70%)
    • No Chemotherapy=17,401 (68.30%)
  – Distant disease only (N=12,331):
    • Chemotherapy=4,143 (33.60%)
    • No Chemotherapy=8,188 (66.40%)
RESULTS: OVERALL SURVIVAL IN PANCREATIC CANCER
RESULTS: SURVIVAL IN LOCOREGIONAL PANCREATIC CANCER

Percent Surviving

Survival in Months

0-3 3-6 6-9 9-12 12-18 18-24 >24

(Bar chart showing survival percentages across different time periods in months.)
RESULTS: SURVIVAL IN DISTANT PANCREATIC CANCER
RESULTS: SURVIVAL IN LOCOREGIONAL PANCREATIC CANCER BY RESECTION STATUS
RESULTS: SURVIVAL IN DISTANT PANCREATIC CANCER BY RECEIPT OF CHEMOTHERAPY
OUTCOME MEASURES

• Health Care Utilization and Events
  – Number of hospital days
  – Number of days with symptoms severe enough to warrant outpatient physician visits
  – Number of days receiving chemotherapy and/or radiation
  – Survival
OUTCOME MEASURES

• Health Care Utilization and Events

  – For the events listed:
    • Total number in 2 year time period
    • Events per month of life (histograms)—may vary by treatment
    • Stratified by duration of survival (≤3 months, >3-6 months, >6-9 months, >9-12 months, >12 months)
    • Stratified by locoregional vs. distant disease (SEER historic stage)
    • Stratified by stage and duration of survival
    • Stratified by treatment
    • Relationship with patient symptoms
ACUTE CARE HOSPITALIZATIONS

[Bar chart showing the number of acute care hospitalizations per person over the months, with a peak in January.]
HOSPITAL DAYS

![Hospital Days Graph]

- Month 1: 8 Hospital Days/Person
- Months 2 to 12: 1 Hospital Day/Person
ICU DAYS

[Bar chart showing ICU days per person by month.]

- Month 1: 1.0 ICU days/person
- Month 2: 0.2 ICU days/person
- Months 3 to 12: 0.1 ICU days/person
PHYSICIAN VISITS

![Bar Chart showing the number of physician visits per person over the months from 1 to 12. The highest number of visits is in the first month, with lower numbers in subsequent months.](chart.png)
DAYS OF MEDICAL CARE

*Days of Medical Care includes days hospitalized, days undergoing tests, and physician visits
CHEMOTHERAPY DAYS

*Denominator is all persons living in each month
CHEMOTHERAPY DAYS

*Denominator is all persons who received chemotherapy in each month
RADIATION DAYS

*Denominator is all persons living in each month
RADIATION DAYS

*Denominator is all persons who received radiation in each month
CHALLENGES IN ANALYSIS AND PRESENTATION

• Lymph Node coding
  – Want to look at total numbers of lymph nodes biopsied
  – Want to look at positive/negative numbers
  – Coding change?

• Unknown Stage
  – Examine characteristics and survival then decide how to analyze
  – Or include with distant stage group?
CHALLENGES IN ANALYSIS AND PRESENTATION

• Symptoms from chemotherapy and surgery may overlap with symptoms from disease itself
  – Will not attempt to differentiate the cause of symptoms
  – Will compare frequencies of different measures in treated and untreated patients within each disease stage and attribute the difference between groups to treatment
CHALLENGES IN ANALYSIS AND PRESENTATION

• Competing Risks

  – Variability in length of survival can make analysis challenging
  – Competing risks—death vs. therapy vs. hospitalizations
  – Stratify by length of survival
  – Look at event rates per person-month of follow-up
  – Compare results across treatments

  – Any suggestions for how to deal with competing risks?
  – Do we present the number of events per month in those that had an event, or in the overall cohort?
CHALLENGES IN ANALYSIS AND PRESENTATION

• Events Per Month of Life (histograms)
  – How to deal with patients who die?
  – Examine outcomes only in those who survive to the end of the specified period?
    • Ex: look at hospital days over the first 6 months after diagnosis in a patient who survives at least 6 months
  – Or censor patients as they die and include them in the analysis for that month?
    • Histogram would have declining numbers in the denominator
CHALLENGES IN ANALYSIS AND PRESENTATION

• Histogram Analyses
  – What to do with patients who are hospitalized across 2 follow-up periods?
    • Ex: Hospitalized for 20 days, 15 days in 1st month and 5 days in 2nd month of follow-up
  – For some outcomes, would it make more sense to summarize over a longer period of time (3 or 6 months)?
CHALLENGES IN ANALYSIS AND PRESENTATION

• Selection Bias
  – Ex: Patients who receive chemotherapy may survive longer than those who do not receive chemotherapy
    • Patients who do not receive chemotherapy may be older, have more comorbidities, died before they received chemotherapy
    • Their worse survival may not be due to lack of chemotherapy
  – Make sure not to interpret selection bias as treatment effect
CLINICAL IMPLICATIONS

• Comparative effectiveness of different treatment strategies
  – “Although not necessarily cured, does a patient with locoregional pancreatic cancer who undergoes surgical resection have longer survival compared to those who did not undergo resection?”
  – “Does a patient with locoregional pancreatic cancer who undergoes surgical resection have fewer symptoms than those who did not undergo resection?”
  – “Does a patient with locoregional pancreatic cancer who undergoes surgical resection have fewer hospitalizations than those who did not undergo resection?”
  – “If a patient with pancreatic cancer only survives one year after surgery, will their quality of life (as measured above) be better than if they didn’t have surgery?”
  – Discuss these questions with patients when deciding upon a treatment strategy
ADDITIONAL ISSUES

• Specific Symptoms
  – Nausea/vomiting
  – Jaundice
  – Pain
  – Infection
  – Neutropenia/anemia
  – Delirium
ADDITIONAL ISSUES

• Across a variety of cancers (pancreas, colon, breast, lung)
  – Hospital days
  – Days with symptoms
  – Resource utilization
  – End-of-Life treatments (may be >24 months from diagnosis with certain kinds of cancer)
    • Hospice enrollment and duration
    • Aggressive care measurements (chemotherapy, ED visits, ICU admissions, death in acute care hospitals)
Comments or Suggestions?
THANK YOU!

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