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Real-world 30-day Readmission Patterns Among Commercially Insured Patients with Metastatic Pancreatic Ductal Adenocarcinoma (mPDAC)

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Background

- Pancreatic cancer is expected to account for over 62,000 new cases and more than 49,000 cancer-related deaths in 2022 in the United States.[1]
- The Centers for Medicare and Medicaid Services (CMS) track unplanned 30-day hospital readmissions as a quality metric through the Hospital Readmissions Reduction Program (HRRP) that encourages hospitals to improve communication and care coordination to better engage patients and caregivers in discharge plans and, in turn, reduce avoidable readmissions.[2]
- There are limited evaluations of unplanned hospital readmissions among patients with mPDAC which can lead to excess economic burden.

Objective

This study aimed to describe the frequency of 30-day readmission among patients with mPDAC who received systemic treatment.

Methods

Study Design and Data Source

A retrospective descriptive analysis was performed using the IBM MarketScan Commercial (CCAE) and Medicare supplemental claims databases. The CCAE Database is composed of fully adjudicated medical and pharmaceutical claims for over 225 million unique patients from 300 contributing employers and 40 contributing health plans across the US. The Medicare Supplemental Database includes inpatient and outpatient Medicare supplemental medical claims, linked to drug, person-level enrollment, and benefit plan design data from both the employer-paid and Medicare-paid components of care.

Patient Selection

- This analysis evaluated adult patients diagnosed with mPDAC and treated with systemic therapy between January 1, 2015 and March 31, 2020
- Eligible patients were those who:
  - Had two diagnoses for pancreatic cancer (ICD-9-CM: 157.xx; ICD-10-CM: C25.xx) separated by 30 days, but no more than one year apart.
  - Had two diagnoses for secondary malignancies (ICD-9-CM: 196.xx - 198.xx, ICD-10-CM: C77.xx - C79.xx) after the initial diagnosis of pancreatic cancer separated by 30 days, but no more than one year apart.
  - Were at least 18 years old at first metastatic diagnosis date.
  - Received systemic treatment indicated for mPDAC on or after the metastatic diagnosis date.
  - Had 6 months of continuous baseline enrollment prior to treatment initiation and at least one month post treatment initiation.
  - Had no evidence of a non-pancreatic cancer within 6 months prior to metastatic diagnosis
  - Experienced a hospital admission on or after treatment initiation.

Measures and Statistical Analyses

- Baseline patient demographics and clinical characteristics were assessed among patients treated in first- (1L) second- (2L), and third-line (3L) therapy.
- Baseline characteristics included: age at hospital discharge, sex, region, plan type, Charlson comorbidity index (CCI), initial length of stay (LOS), and treatment type.
- The frequency of intensive care use admissions, readmissions within 30-days of discharge, and the most common primary admission diagnoses which led to readmission were assessed.
- Statistical analyses were conducted using SAS software version 9.4 (SAS Institute Inc., Cary, NC, US).

Table 1. Patient characteristics by line of therapy

	First Line Treated mPDAC Patients N = 2,561	Second Line Treated mPDAC Patients N = 1,085	Third Line Treated mPDAC Patients N = 1,085
Age at hospital discharge, years, Median (Q1-Q3)	61 (55 - 66)	60 (54 - 64)	60 (54 - 64)
Male, n (%)	1,407 (54.9%)	593 (54.7%)	181 (48.5%)
Geographic region, n (%)			
North Central	691 (27%)	291 (26.8%)	96 (25.7%)
Northeast	549 (21.4%)	256 (23.6%)	110 (29.5%)
South	1,006 (39.3%)	409 (37.7%)	125 (33.5%)
West	304 (11.9%)	123 (11.3%)	39 (10.5%)
Unknown	11 (0.4%)	6 (0.6%)	3 (0.8%)
Payer type, n (%)			
Commercial	1,884 (73.6%)	846 (78%)	297 (79.6%)
Medicare	677 (26.4%)	239 (22%)	76 (20.4%)
Charlson comorbidity index, n (%)			
0	528 (20.6%)	253 (23.3%)	81 (21.7%)
1	770 (30.1%)	326 (30.1%)	116 (31.1%)
2	545 (21.3%)	224 (20.7%)	74 (19.8%)
3+	718 (28.0%)	282 (26.0%)	102 (27.4%)
Treatment type, n (%)			
FOLFIRI	42 (1.6%)	35 (3.2%)	14 (3.8%)
FOLFIRINOX	700 (27.3%)	137 (12.6%)	30 (8%)
FOLFOX	112 (4.4%)	79 (7.3%)	30 (8%)
Gemcitabine plus nab-paclitaxel	845 (33.0%)	377 (34.8%)	74 (19.8%)
Gemcitabine	219 (8.6%)	56 (5.2%)	20 (5.4%)
Liposomal irinotecan-based	16 (0.6%)	73 (6.7%)	55 (14.8%)
Other	627 (24.5%)	328 (30.2%)	150 (40.2%)
Initial length of stay, days			
Mean (SD)	5.1 (5.2)	5.2 (5.1)	5.3 (4.7)
Median (Q1-Q3)	4 (2 - 6)	4 (2 - 6)	4 (2 - 7)
Admitted to ICU, n (%)	442 (17.3%)	201 (18.5%)	66 (17.7%)
Readmitted within 30 days, n (%)	581 (22.7%)	280 (25.8%)	95 (25.5%)

CONCLUSIONS

- This real-world study found that between 20-25% of patients who are hospitalized while receiving treatment for mPDAC will experience a readmission.
- The rate of readmission in the 2L setting was lowest among patients who received liposomal irinotecan-based regimens.
- Further studies are needed to characterize the burden and predictors of readmissions among patients with mPDAC.

Limitations

- Retrospective claims are collected primarily for medical billing purposes and do not contain detailed clinical information needed to fully characterize the disease stage and functional status of patients included in our study.
- Detailed treatment information is not available in the inpatient setting from the claims data
- Mortality data are not available to accurately determine a patient's status after the initial hospital discharge.

Results

Patient Characteristics

- 2,561 patients with mPDAC treated with 1L were included. Of those patients treated with 1L, 1,085 received 2L, and 373 received 3L.
- The median age at hospital discharge ranged between 60-61 years among patients treated in 1L-3L.
- The most common 1L therapies were gemcitabine plus nab-paclitaxel (33.0%) and FOLFIRINOX (27.3%).
- Nearly half of all patients had a CCI score of 2+ across all lines of therapy, range: 46.7% - 49.3%.
- Liposomal irinotecan-based regimens were used by 0.6%, 6.7%, and 14.8% of patients treated in 1L, 2L, and 3L, respectively.

Readmissions/Hospital utilization

- Readmissions occurred in 22.7% (n=581) patients treated in 1L, 25.8% (n=280) of patients treated in 2L, and 25.5% (n=95) of patients treated in 3L.
- ICU admissions occurred in 17.3%, 18.5%, and 17.7% of initial admissions among patients treated in 1L, 2L, and 3L, respectively.
- Common primary diagnoses which led to readmissions across all lines of therapy were pancreatic cancer (14.1%), sepsis (9.8%), metastases (7.7%), and symptomatic complications (5.2%) [e.g nausea/vomiting, fever] (Figure 1).
- Among 1L regimens, the readmission rate was 24.9% for patients treated with FOLFIRINOX, 22.1% for those treated with gemcitabine plus nab-paclitaxel, and 21.5% for those who received gemcitabine monotherapy. Among 2L regimens, those treated with liposomal irinotecan-based regimens had the lowest readmission rates (16.4%) (Figure 2).

Figure 1. Common initial primary diagnoses leading to 30d readmission

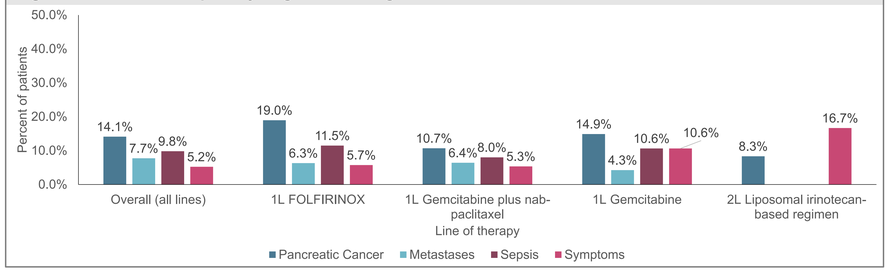
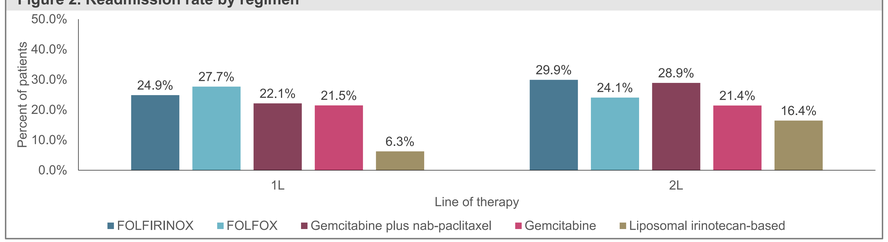


Figure 2. Readmission rate by regimen



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