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Incidence of ileus and associated factors in patients with acute pancreatitis: a nationwide analysis

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Abstract

Background Ileus is a well-known complication of acute pancreatitis (AP). There are limited data on the factors associated with ileus, as well as its impact on AP patients. We aimed to investigate the incidence and clinical predictors of ileus in hospitalized AP patients.

Methods We queried the 2016-2019 National Inpatient Sample (NIS) database using the International Classification of Diseases (ICD)-10 codes. Adult patients diagnosed with AP (ICD-10 K85) were included, excluding those with chronic pancreatitis. Demographics, comorbidities, complications and interventions were stratified by the presence of ileus. Multivariate analysis identified factors associated with ileus, adjusting for patient and hospital characteristics, comorbidities, and pancreatitis complications.

Results Among 1,386,390 AP patients, 50,170 (3.6%) developed ileus. Female sex was associated with a lower risk (adjusted odds ratio [aOR] 0.56, 95% confidence interval [CI] 0.53-0.58; P<0.001). Hispanic patients had the lowest risk (aOR 0.82, 95%CI 0.76-0.88), while older age groups had a higher risk. Pseudocysts (P<0.001), sepsis (P<0.001) and portal vein thrombosis (P<0.001) were significant predictors. Pancreatic drainage was associated with ileus (P=0.007), but endoscopic retrograde cholangiopancreatography was not. Patients with ileus had greater mortality (P<0.001), longer hospital stays (+4.9 days, P<0.001), and higher costs ($67,855.91, P<0.001).

Conclusions This study highlights age, sex and racial disparities in the development of ileus in patients with AP. It also reveals a significant association of ileus with pseudocysts, portal vein thrombosis, and pancreatic drainage. Early recognition and timely enteral feeding are crucial to prevent disease progression and improve outcomes.

Keywords Ileus, pancreatitis, national inpatient sample, factors, incidence

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Introduction

Acute pancreatitis (AP) is one of the most common causes of gastrointestinal hospitalizations, with more than 200,000 hospitalizations a year in the United States of America (US) and an estimated expenditure of US $2.6 billion annually [1]. The incidence of AP has been increasing over the years, with a decrease in mortality rates [2].

Dysmotility in the gastrointestinal tract has been studied in mice models with AP [3]. One of the known consequences of dysmotility is ileus. The underlying mechanism of ileus in pancreatitis is not clearly understood, but it is thought to be due to retroperitoneal inflammation and/or transient clinic ischemia affecting viscerally mediated reflexes within the superior mesenteric plexus [4]. A recent study in a Midwest cohort has shown that the development of ileus correlates with the severity of pancreatitis [5]. Ileus development is known to delay enteral feeds and can lead to the prolongation of hospital stay.

A review of the literature reveals only sparse data regarding the incidence of ileus development and the factors associated with it. In this study, we aimed to fill the gaps in information by studying the incidence of ileus in AP, determining the factors associated with ileus in patients with AP, and measuring the effect of ileus on in-hospital outcomes.

Materials and methods

Data source

The National Inpatient Sample (NIS) database, administered by the Agency for Healthcare Research and Quality, is the largest inpatient database in the US. It contains data from 20% of all hospitalizations in the US, representing approximately 8 million (unweighted) and 40 million (weighted) hospitalizations yearly [6]. The NIS database contains clinical and resource utilization data, while protecting the privacy of patients, physicians and hospitals. It includes 1 primary diagnosis, up to 40 secondary diagnoses, population baseline characteristics, patient comorbidities and total charges.

Study population

The NIS database from 2016-2019 was queried according to the International Classification of Diseases, Tenth Revision (ICD-10), Clinical Modification for patients with a discharge diagnosis of AP (ICD10-K85). Patients were divided into 2 groups based on the presence of ileus. ICD-10 codes K56.0, K56.3 and K56.7 were used to query patients with a concomitant diagnosis of ileus. Patients who were under 18 or had inadequate demographic information were excluded from the analysis. We also excluded patients with chronic pancreatitis and pancreatic cancer. A total of 1,386,389 patients were included in the analysis (Fig. 1).

Study variables

Data were collected on patient demographics (age, sex, race, primary insurance, income quartile), hospital characteristics (location, region, teaching status, size), and Elixhauser comorbidities [7]. We also studied common etiologies, such as biliary pancreatitis and alcohol-related pancreatitis, as well as the common conditions associated with pancreatitis, such as pancreatic pseudocyst, portal vein thrombosis, pneumonia and bacteremia. Information about common interventions, such as total parenteral nutrition (TPN) and endoscopic retrograde cholangiopancreatography (ERCP), was also included.

Outcomes

The primary study measure was the prevalence of ileus in patients with AP. Secondary outcomes were the factors associated with ileus in AP, and the effect of ileus on outcomes in patients with AP. The categorical outcome studied was mortality, while continuous outcomes studied were the length of stay and total hospitalization charges. Hospital charges are defined as the dollar amount the hospital charges for services prior to negotiating discounts with insurance companies.

Statistical analysis

The chi-square test was used to compare categorical variables, while the independent *t*-test was used to compare continuous variables. Data are presented as population-weighted mean ± standard error for continuous variables and as total number of patients with percentages for categorical factors. In order to study the factors associated with ileus in pancreatitis, we performed a univariate analysis to assess differences between patients with ileus and those without. This was followed by a multivariate analysis using variables found to be statistically significant in the univariate analysis (those with a P-value <0.1). The results were expressed as adjusted odds ratio (aOR) with 95% confidence interval (CI). To study the effect of ileus on continuous and categorical outcomes, a univariate and a multivariate regression analysis were performed to identify the relationship between ileus and outcomes. The categorical outcome studied was in-patient mortality, while continuous outcomes, such as length of stay, total hospitalization cost and charges, were also analyzed. The variables included in the univariate analysis were patient characteristics, hospital characteristics, Elixhauser comorbidity index, etiology of acute AP, complications of AP and common interventions. This was followed by a multivariate analysis that included those factors noted to be statistically significant.

Results

Patient demographics

A total of 1,386,389 patients were included in the analysis, of whom 50,170 (3.6%) developed ileus. Ileus was predominantly seen in males (65.03%), 35.3% of patients with ileus and AP were older than 65 years, while 91% were admitted to urban hospitals. Ileus was most commonly seen in Whites (69.52%), followed by African Americans (13.2%) and Hispanics (10.64%). Patients with ileus had a high comorbidity burden, with 73.28% having more than 3 Elixhauser comorbidities. Ileus was more common in patients with biliary pancreatitis (22.96%) as compared to alcohol-related pancreatitis (18.86%). A complete list of patient characteristics stratified by the presence of ileus is presented in Table 1.

Comorbidities and complications

Patients with ileus had a higher incidence of cardiac arrhythmias (24.08% vs. 14.28%), congestive heart failure

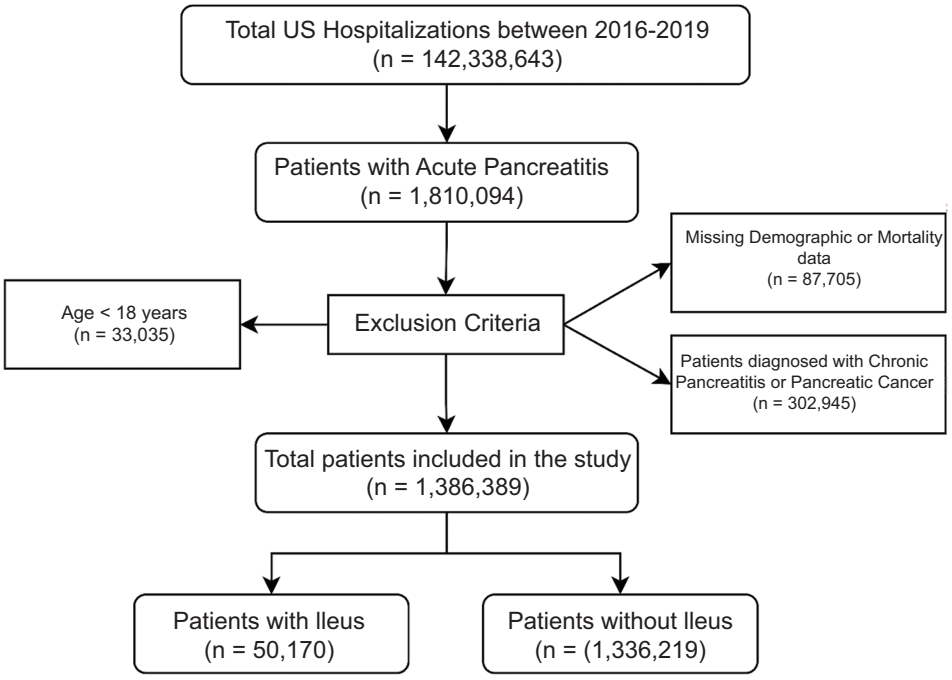

Figure 1 Flowchart of case selection for patients with acute pancreatitis

(12.2% vs. 9.27%), valvular diseases (3.64% vs. 2.93%), hypertension (59.87% vs. 56.53%), fluid and electrolyte disorders (64.09% vs. 43.74%), malnutrition (19.37% vs. 8.26%), chronic liver disease (24.1% vs. 20.63%), non-metastatic solid tumor (4.17% vs. 3%) and metastatic tumor (2.41% vs. 1.83% compared to controls).

Patients with ileus had a lower incidence of diabetes mellitus (25.47% vs. 28.45%), depression (11.8% vs. 13.89%), and drug abuse (6.34% vs. 7.39%). There were no significant differences noted in the incident rates between the 2 groups in terms of hypothyroidism (9.9% vs. 10.24%), alcohol use (24.55% vs. 25.38%), rheumatoid arthritis or collagen vascular diseases (2.3% vs. 2.61%).

There was a higher incidence of pneumonia (13.5% vs. 4.43%), acute kidney injury (AKI; 36.38% vs. 18.18%), and pancreatic pseudocyst (7.9% vs. 3.31%) in patients with ileus compared to those without. Patients with ileus also had a higher incidence of requiring total parenteral nutrition (8.69% vs. 1.02%) and pancreatic pseudocyst drainage (2.35% vs. 0.69%). The results of Elixhauser comorbidities, common conditions associated with pancreatitis, and interventions stratified by the presence of ileus are presented in Table 2.

Factors associated with ileus development

Older age (>65 years) was associated with a 14% higher risk of developing ileus compared to the younger age group, 18-44 years. Females had a lower risk of developing ileus compared to males after adjusting for other factors. Hispanic patients had the lowest risk of developing ileus, as low as 18%, compared to White patients. Patients with private insurance, as well as higher income quartiles (third or the highest), were at higher risk of developing ileus. There was no statistical difference based on the hospital's location or teaching status on the risk of developing ileus. The results of the multivariate analysis of patient demographics and interventions are presented in Fig. 2, while the results for comorbidities and etiologies are presented in Table 3.

No statistically significant difference was noted in the risk of developing ileus in patients with biliary and alcohol-related pancreatitis. Patients with concomitant biliary and alcohol-related pancreatitis were at a 1.81 times higher risk of developing ileus as compared to patients with biliary pancreatitis alone. The risk of developing ileus was higher in patients with comorbidities than in those without comorbidities.

The presence of congestive heart failure was associated with a 26% higher probability of having ileus in patients with AP. The presence of fluid/electrolyte abnormalities was associated with a 59% higher probability of having ileus. Furthermore, alcohol or drug use was associated with a lower risk of having ileus in patients with AP. The presence of portal vein thrombosis and pancreatic pseudocysts in patients with AP was associated with a higher risk of developing ileus.

Patients with sepsis had higher odds of developing ileus. The presence of shock was also associated with 75%

Table 1 Patient characteristics and demographics, stratified by the presence of ileus

Demographics	Absence of ileus, n (%)	Presence of ileus, n (%)	P-value
Age category (years)			<0.001
18-44	428,020 (32.03)	12,670 (25.25)	
45-64	516,405 (38.65)	19,790 (39.45)	
>65	391,795 (29.32)	17,710 (35.30)	
Sex			<0.001
Male	670,600 (50.19)	32,625 (65.03)	
Female	665,620 (49.81)	17,545 (34.97)	
Race			<0.001
White	851,189 (63.70)	34,880 (69.52)	
African American	198,780 (14.88)	6,630 (13.22)	
Hispanic	197,435 (14.78)	5,340 (10.64)	
Asian/Pacific Islander	34,810 (2.61)	1,510 (3.01)	
Native American	12,015 (0.90)	315 (0.63)	
Other	41,990 (3.14)	1,495 (2.98)	
Primary expected payer			<0.001
Medicare	464,520 (34.76)	19,940 (39.74)	
Medicaid	297,840 (22.29)	8,410 (16.76)	
Private	412,530 (30.87)	17,060 (34.0)	
Uninsured	113,590 (8.50)	3,055 (6.01)	
Median household income			<0.001
Lowest quartile	426,740 (31.94)	14,370 (28.64)	
Second quartile	355,120 (26.58)	12,955 (25.82)	
Third quartile	315,355 (23.60)	12,610 (25.13)	
Highest quartile	239,005 (17.89)	10,235 (20.40)	
Region of hospital			<0.001
Northeast	221,565 (16.58)	7,180 (14.31)	
Midwest	275,290 (20.6)	11,870 (23.66)	
South	546550 (40.9)	20,045 (39.95)	
West	292,814 (21.91)	11,075 (22.07)	
Location			<0.001
Rural	137,785 (10.31)	4,165 (8.30)	
Urban	1,198,435 (89.69)	46,005 (91.7)	
Teaching status			<0.001
Non-teaching	482,979 (36.15)	16,305 (32.50)	
Teaching hospitals	853,240 (63.85)	33,865 (67.50)	
Hospital size (no. of beds)			<0.001
Small	310,469 (23.23)	10,065 (20.06)	
Medium	411,345 (30.78)	14,715 (29.33)	
Large	614,405 (45.98)	25,390 (50.61)	
Number of Elixhauser comorbidities			<0.001
0	102,385 (7.66)	1,750 (3.49)	
1	181,605 (13.59)	4500 (8.97)	
2	236780 (17.72)	7155 (14.26)	
3 or more	815450 (61.03)	36765 (73.28)	
Etiology			<0.001
Biliary pancreatitis	309,965 (23.20)	11,520 (22.96)	
Alcohol-related pancreatitis	256,510 (19.2)	9,460 (18.86)	
Biliary & alcohol-related pancreatitis	3,005 (0.23)	230 (0.46)	
Other causes	766,740 (57.38)	28,960 (57.72)	

higher odds of having concomitant ileus. Acute kidney injury was associated with a 38% higher risk of developing ileus, while ERCP was not associated with higher odds of developing ileus. Pancreatic drainage and TPN use were associated with higher odds of having concomitant ileus.

Table 2 Comorbidities, complications and interventions in hospitalized patients with acute pancreatitis, stratified by the presence of ileus Q: Please check the highlighted numbers

Comorbidities	Absence of ileus, n (%)	Presence of ileus, n (%)	P-value
Cardiac arrhythmias	190,750 (14.28)	12,080 (24.08)	<0.001
Congestive heart failure	123,810 (9.27)	6,120 (12.2)	<0.001
Valvular disease	39,095 (2.93)	1,825 (3.64)	<0.001
Pulmonary circulation disorders	26,615 (1.99)	1,530 (3.05)	<0.001
Peripheral vascular disorders	59,355 (4.44)	2,960 (5.9%)	<0.001
Hypertension	755,340 (56.53)	30,035 (59.87)	<0.001
Chronic pulmonary disease	212,080 (15.87)	8,525 (16.99)	0.0027
Diabetes	380,110 (28.45)	12,780 (25.47)	<0.001
Hypothyroidism	136,890 (10.24)	4,975 (9.92)	0.2898
Renal failure	165,650 (12.4)	7,360 (14.67)	<0.001
Liver disease	2,75620 (20.63)		<0.001
Peptic ulcer w/o bleeding	26,285 (1.97)	1,055 (2.1)	0.337
AIDS/HIV	5,650 (0.42)	230 (0.46)	0.5848
Lymphoma	7,705 (0.58)	290 (0.58)	0.9854
Metastatic cancer	24,495 (1.83)	1,210 (2.41)	<0.001
Solid tumor w/o metastasis	40,110 (3.0)	2,090 (4.17)	<0.001
Rheumatoid arthritis	34,835 (2.61)	1,170 (2.33)	0.091
Coagulopathy	130,125 (9.74)	7,805 (15.56)	<0.001
Weight loss	110,380 (8.26)	9,720 (19.37)	<0.001
Fluid and electrolyte disorder	584,510 (43.74)	32,155 (64.09)	<0.001
Blood loss anemia	8,205 (0.61)	485 (0.97)	<0.001
Deficiency anemia	56,375 (4.22)	2,305 (4.6)	0.068
Alcohol abuse	339,105 (25.38)	12,315 (24.55)	0.063
Drug abuse	100,120 (7.49)	3,180 (6.34)	<0.001
Psychosis	17,410 (1.3)	660 (1.32)	0.916
Depression	185,585 (13.89)	5,920 (11.8)	<0.001
Complications	**Absence of Ileus, n (%)**	**Presence of Ileus, n (%)**	**P-value**
Pneumonia	59,135 (4.43)	6,775 (13.5)	<0.001
Bacteremia	8,135 (0.61)	405 (0.81)	0.015
AKI	242,865 (18.18)	18,250 (36.38)	<0.001
Portal vein thrombosis	10,120 (0.76)	1,015 (2.02)	<0.001
Pseudocyst	44,190 (3.31)	3965 (7.9)	<0.001
Sepsis	55,740 (4.17)	5,195 (10.35)	<0.001
Shock	50,450 (3.78)	6,870 (13.69)	<0.001
ICU admission	54,545 (4.08)	8,865 (17.67)	<0.001
Interventions	**Absence of Ileus, n (%)**	**Presence of Ileus, n (%)**	**P-value**
TPN	13,620 (1.02)	4360 (8.69)	<0.001
Pancreatic drainage	9,215 (0.69)	1,180 (2.35)	<0.001
ERCP	123,685 (9.26)	5,095 (10.16)	0.002

AIDS/HIV, acquired immunodeficiency syndrome/human immunodeficiency virus; TPN, total parenteral nutrition; ERCP, endoscopic retrograde cholangiopancreatography

Table 3 Odds ratios of patient comorbidities and etiologies, after multivariate analysis. Adjustments were made for patient demographics, comorbidities and complications

Comorbidities	Adjusted odds ratio	95% confidence interval	P-value
Cardiac arrhythmias	0.86	0.80-0.93	<0.001
Congestive heart failure	1.26	1.19-1.33	<0.001
Valvular disease	0.97	0.86-1.09	0.587
Pulmonary circulation disorders	0.96	0.85-1.09	0.558
Peripheral vascular disorders	0.95	0.87-1.04	0.279
Paralysis	1.32	1.07-1.62	0.009
Other neurological disorders	1.01	0.94-1.08	0.83
Chronic pulmonary disease	1.01	0.95-1.07	0.704
Chronic kidney disease	0.83	0.78-0.89	<0.001
Liver disease	1.01	0.96-1.07	0.637
Metastatic solid tumor	0.84	0.72-0.99	0.036
Non-metastatic solid tumor	1.05	0.93-1.19	0.407
Rheumatoid arthritis/collagen vascular disorder	0.87	0.76-1.00	0.054
Coagulopathy	0.98	0.92-1.05	0.647
Malnutrition	1.32	1.24-1.14	<0.001
Fluid/electrolyte disorders	1.59	1.51-1.67	<0.001
Blood loss anemia	1.17	0.95-1.45	0.146
Deficiency anemia	0.93	0.84-1.03	0.152
Alcohol abuse	0.73	0.68-0.78	<0.001
Drug use	0.88	0.81-0.96	0.003
Psychosis	0.97	0.80-1.17	0.721
Depression	0.87	0.81-0.92	<0.001
Diabetes	0.71	0.68-0.75	<0.001
Hypertension	0.98	0.93-1.03	0.348
Etiology	**Adjusted odds ratio**	**95% confidence Interval**	**P-value**
Biliary pancreatitis	Reference		
Alcohol pancreatitis	0.98	0.89-1.17	0.583
Biliary + alcohol pancreatitis	1.81	1.32-2.47	<0.001
Other causes	0.88	0.84-0.93	<0.001

Effect of ileus on outcomes in hospitalized patients with AP

Mortality

The incidence of mortality in patients with ileus and AP was 6.38% compared to 2.5% in patients without ileus. On multivariate analysis, ileus was noted to be an independent predictor of mortality (aOR 1.58, 95%CI 1.43-1.75; P<0.001).

Length of stay

The mean length of hospital stay in patients without ileus was 5.15±0.18 days. The mean length of stay in patients with ileus and AP was 12.67±0.15 days. On multivariate linear regression, the presence of ileus was associated with a statistically significantly longer hospital stay (+4.9 days, 95%CI 4.63-5.12 days; P<0.001).

Total hospitalization charges

The mean total hospitalization charges in patients without ileus were $57,963.3. The mean total hospitalization charges in patients with ileus and AP were $163,713.7. On multivariate analysis, the presence of ileus was associated with statistically significantly greater hospitalization charges (+67,855.91, 95%CI $62,373-$73,338; P<0.001).

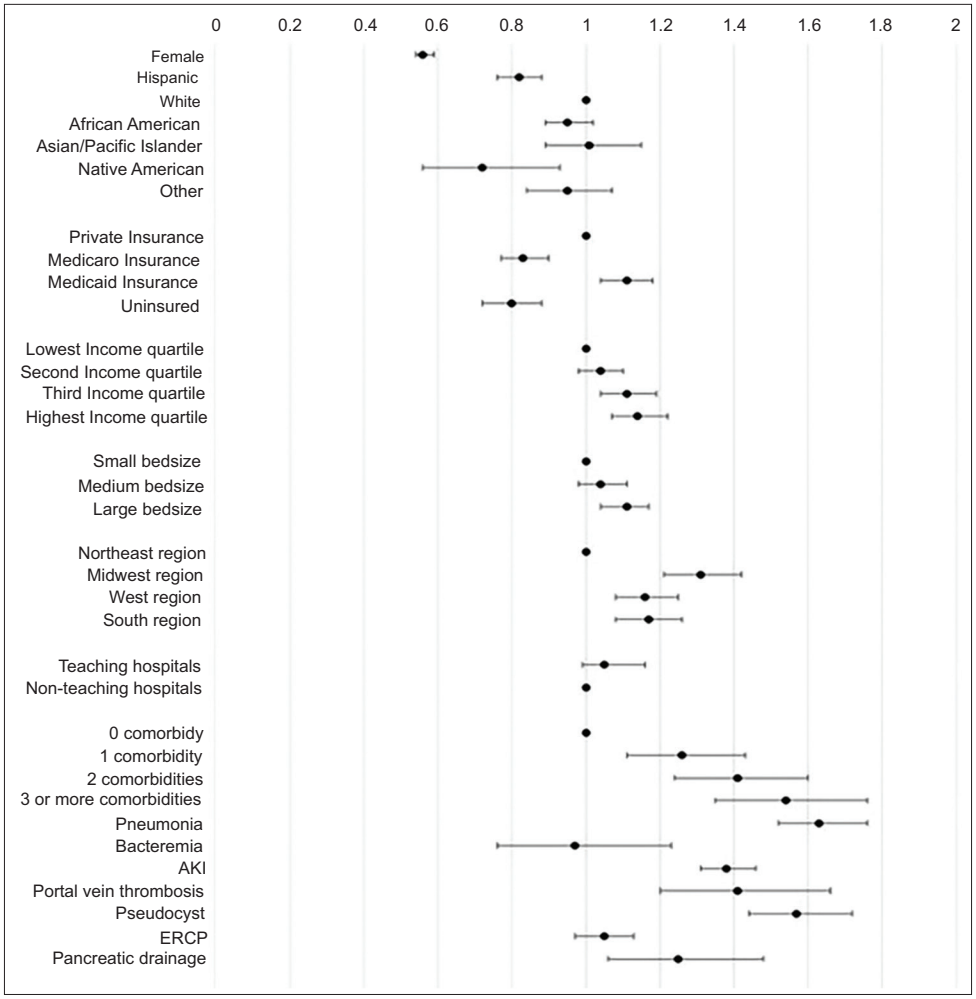

Figure 2 Forest plot depicting odds ratios of patient demographics and complications, after multivariate analysis. Adjustments were made for patient demographics, comorbidities and complications
AKI, acute kidney injury; ERCP, endoscopic retrograde cholangiopancreatography

Total hospitalization costs

The mean hospitalization cost in patients without ileus was $13,587.33, while the mean cost in patients with ileus was $38,941. On multivariate analysis, the presence of ileus was associated with a statistically greater hospitalization cost ($16,252.6, 95%CI $15,002-$17,502; P<0.001).

Discussion

Our study is the first to evaluate the prevalence of ileus in patients with AP in the US using a large database drawn from the inpatient population. Our analysis revealed the prevalence of ileus in AP to be 3.6%. The association with ileus differed by age group. The elderly population (age >65 years) was at higher risk of developing ileus compared to the younger population (age <45). This association may be due to the longer colonic transit time noted in the elderly [8]. Long-standing chronic medical conditions such as diabetes mellitus and hypothyroidism, which are more often seen in the elderly, may also decrease gastrointestinal motility [9,10]. In addition, many frequently used drugs in this patient population, such as anticholinergics, opioids and antidepressants, are associated with disordered gastrointestinal motility, which could also explain the higher risk of ileus.

Interestingly, females had a 44% lower risk of ileus compared to males, despite existing literature suggesting that females might be at higher risk due to slower colonic motility [11]. Racial differences were also noted in our study. Hispanics were noted to have a lower risk of ileus than Whites and African Americans. Differences were also noted based on the income quartile. Interestingly, the highest risk of developing ileus was noted in patients in the higher-income quartiles compared to the lower-income quartiles. Further research is needed to study the underlying factors responsible for age, sex, race, and income disparities.

Our study found that patients admitted to larger hospitals are at higher risk of developing ileus. Large hospitals often serve as transfer centers for patients with higher acuity from small and medium sized hospitals, which might contribute to

the higher incidence of ileus. No differences were noted in the rates of ileus based on the teaching status or the location of the hospital. The risk of ileus also increased with the number of comorbidities. Patients with 3 or more comorbidities had a 54% higher risk than those without comorbidities.

We also found that electrolyte disorders were associated with a higher risk of ileus. Although not all electrolytes were studied separately, electrolyte abnormalities such as hypokalemia might contribute to this association. Electrolyte abnormalities have been studied in prolonged ileus, and it has been postulated that, although they may not be the primary etiology of ileus, they can delay recovery of gut motility [12]. Furthermore, patients with paralysis were at a higher risk of developing ileus. Immobilization is a known risk factor for ileus, which could explain this finding. Physicians should be aware of this association, and early physical therapy in patients with paralysis and AP may help decrease the risk of developing ileus.

Ileus was also associated with complications of pancreatitis, including pneumonia and AKI. The presence of pneumonia was associated with a 63% higher risk of developing ileus, while bacteremia was not associated with ileus. There is a possibility that acute infection can trigger the development of ileus via inflammatory pathways in pneumonia, although this needs to be further studied [13]. The presence of AKI was associated with a 38% higher risk of ileus. Patients with ileus may not receive enteral nutrition for days, leading to dehydration and AKI. Acute uremia in patients with AKI may also contribute to the development of ileus [14]. The development of AKI alone during AP is a poor prognostic factor with a high mortality rate [15].

On the contrary, patients with chronic kidney disease (CKD) had a lower risk of developing ileus. These patients may be resistant to small changes in waste products and, as a result, these have minimal effect on gut motility. Furthermore, patients with CKD stage 5 are on hemodialysis, which removes nitrogenous waste products and may help restore motility. We also found that patients with pseudocysts have a higher association with ileus. Ileus secondary to pseudocyst has previously been documented, and it has been suggested that it is due to the pressure effect of the pseudocyst on the bowel [16]. In addition, newly developed pseudocysts are associated with a severe course of AP, thus having a higher risk of complications such as ileus [17].

The incidence of sepsis, shock, and Intensive Care Unit admissions was higher in patients with ileus. Shock and sepsis are associated with increased intestinal permeability and decreased perfusion to the gut, possibly contributing to the development of ileus [18]. In animal models, severe AP has been associated with an increased proportion of nitric oxide synthase-immunoreactive neurons in the ileal myenteric ganglia, which may be involved with the development of ileus in these patients [19]. The incidence of death was also noted to be higher in patients with ileus. After adjusting for confounding variables, patients with ileus had 58% higher mortality than those without ileus. We also found that ileus was associated with a 4.9-day longer hospital stay, compared to patients without ileus, contributing to higher hospitalization charges ($62,373 vs. $16,252, respectively). The presence of ileus may delay enteral nutrition initiation and sometimes require total parenteral nutrition, contributing to higher costs and lengths of stay. Clinicians should recognize the development of ileus and its possible complications, which can lead to rapid decompensation.

This study had several limitations. First, the NIS lacks granular clinical data, limiting our ability to calculate the severity of illnesses, using metrics such as the APACHE or BISAP scores. Secondly, information about treatments, such as intravenous fluids or pain medications, is not included in the NIS, and these are important confounders that may affect patient outcomes. Additionally, the absence of patient identifiers precludes the tracking of readmissions or distinguishing primary admissions from readmissions. The study's strength comes from its large population size and the exclusion of sample bias from data collected from a single region or hospital. These findings should be validated in a prospective cohort that captures more granular clinical data.

Our study revealed the prevalence of ileus in AP to be 3.6%. Older age, male sex and higher income were associated with a higher risk of ileus, while the risk was lower in the younger population, females, Hispanics, and patients with lower socioeconomic status. The concomitant presence of ileus in AP patients was associated with higher mortality, longer hospital stays and increased resource utilization. Early initiation of oral or enteral feeding (within 24-72 h) is a key strategy in preventing ileus. Clinicians should remain vigilant about the potential development of ileus in AP patients, especially those in the high-risk group.

Summary Box

What is already known:

- Ileus is a recognized complication of acute pancreatitis (AP) and has been associated with disease severity
- The exact mechanisms contributing to ileus in AP remain unclear, but are thought to involve inflammation-mediated gut dysmotility
- Previous studies have suggested that ileus may prolong hospital stay and increase morbidity in AP patients
- Limited nationwide data exist on the incidence, predictors, and clinical impact of ileus in patients with AP

What the new findings are:

- The incidence of ileus in hospitalized patients with AP was 3.6%, with older age, male sex and higher income quartiles being significant risk factors
- Ileus was associated with increased odds of mortality (adjusted odds ratio 1.58, 95% confidence interval 1.43-1.75), longer hospital stays (+4.9 days), and higher hospitalization costs
- Specific pancreatitis complications, such as pseudocysts and portal vein thrombosis, were strongly associated with ileus development
- Timely recognition and early enteral feeding could mitigate the negative impact of ileus in AP patients, improving clinical outcomes

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