

Fluid Resuscitation in Acute Pancreatitis: A Balancing Act for Patients with Congestive Heart Failure Exacerbation using National Inpatient Sample (NIS) data from 2016-2020



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Table 1: Demographics

	Acute Pancreatitis with CHF Exacerbation (n = 129,585)	Acute Pancreatitis without CHF Exacerbation (n = 33,345)	p-value
Mean Age, years	65.9	67.8	<0.001
Gender, n			
Male	69755 (53.83%)	17110 (51.31%)	<0.001
Female	59814 (46.16%)	16230 (48.67%)	
Race, n			
White	81060 (62.55%)	21755 (65.24%)	<0.001
Black	27885 (21.52%)	5535 (16.60%)	<0.001
Hispanic	11070 (8.54%)	3135 (9.40%)	0.031
Asian or Pacific Islander	2900 (2.24%)	1070 (3.21%)	<0.001
Native American	790 (0.61%)	240 (0.72%)	0.335
Other	2950 (2.28%)	800 (2.40%)	0.553
Obesity, n	28185 (21.75%)	7325 (21.97%)	0.709
Diabetes, n	60870 (46.97%)	13985 (41.94%)	<0.001
COPD, n	33265 (25.67%)	8715 (26.14%)	0.438
Cerebrovascular Disease, n	7205 (5.56%)	2310 (6.93%)	<0.001
Cirrhosis, n	8795 (6.79%)	1970 (5.91%)	0.010
Smoking History, n	55290 (42.67%)	11220 (33.65%)	<0.001
ESRD, n	15420 (11.90%)	3535 (10.60%)	0.004
Alcohol Abuse, n	22905 (17.68%)	4800 (14.39%)	<0.001
Drug Use, n	8220 (6.34%)	1980 (5.94%)	0.233
Cancer, n	6495 (5.01%)	1685 (5.05%)	0.891
Dementia, n	8570 (6.61%)	2150 (6.45%)	0.625
Malnutrition, n	8795 (6.79%)	3540 (10.62%)	<0.001
Mean Length of Stay, days	6.8	12.6	<0.001
Charlson Comorbidity Index			
1	13185 (10.17%)	3305 (9.91%)	0.514
2	22905 (17.68%)	5740 (17.21%)	0.371
3	25275 (19.50%)	5875 (17.62%)	<0.001
4	20035 (15.46%)	5215 (15.64%)	0.723
5 or more	48175 (37.18%)	13210 (39.62%)	<0.001

Introduction

- The mainstay of treatment for acute pancreatitis is aggressive fluid resuscitation
- The pathophysiology supporting this is that lack of perfusion to the pancreas from hypovolemia, may lead to pancreatic necrosis
- In patients presenting with acute pancreatitis with history of congestive heart failure (CHF), treating with an abundance of intravenous fluids has been feared to be more harmful than effective
- The aim of this study is to assess inpatient complications in CHF patients presenting with primary diagnosis of acute pancreatitis with and without CHF exacerbation

Methods

- Retrospective cohort study using NIS data including adults hospitalized between 2016 and 2020
- Primary diagnosis of non-necrotizing pancreatitis and history of CHF
- Primary outcomes measured: Severe complications of CHF
- Statistical analyses were all performed using STATA software

Results

- Of the 162,930 patients with acute pancreatitis and history of CHF, 129,585 (79.5%) patients' hospital course was complicated by CHF exacerbation
- The average age of patients with CHF exacerbation was less than those without exacerbation (65.9 vs 67.8; p<001)
- A statistically significant (p<0.05) increase in exacerbation was seen in patients who were male, Black, and those with diabetes, cirrhosis, smoking history, end-stage renal disease, and alcohol abuse
- A lack of exacerbations was seen in patients who were female, White, Hispanic, Asian/Pacific Islanders, and those patients with cerebrovascular disease and malnutrition (Table 1)
- Patients with exacerbations had a statistically significant decreased association (p<0.05) of all complications including pleural effusion, acute respiratory distress syndrome, acute coronary syndrome, sepsis, shock, cardiac arrest, mortality and those requiring transfusion, intubation, mechanical ventilation, or ICU level of care (Table 2)

Discussion

- Patients with acute pancreatitis with concomitant CHF exacerbation experienced fewer complications, shorter lengths of stay, and decreased mortality rates
- This data speculates that when treating patients for acute pancreatitis who have a history of CHF, we should not be as concerned about patients developing volume overload, as these results indicate that the patients that did develop a CHF exacerbation ended up doing better than those who did not have an exacerbation. This may suggest that those who did not end up in exacerbation did not receive enough fluids and therefore had more complications
- Future studies can explore this theory by quantifying the exact amount and timing of fluids given for these CHF patients presenting with acute pancreatitis

Table 2: Complications

	Acute Pancreatitis with CHF Exacerbation (n = 129,585)	Acute Pancreatitis without CHF Exacerbation (n = 33,345)	p-value	Odds Ratio (95% Confidence Interval)
Pleural Effusion, n	4445 (3.43%)	2715 (8.14%)	<0.001	0.401 (0.359 - 0.448)
ARDS, n	740 (0.57%)	520 (1.56%)	<0.001	0.353 (0.282 - 0.465)
ACS, n	4485 (3.46%)	3620 (10.86%)	<0.001	0.294 (0.266 - 0.326)
Sepsis, n	24195 (18.67%)	11095 (33.27%)	<0.001	0.460 (0.434 - 0.488)
Requiring Transfusion, n	7375 (5.69%)	3295 (9.88%)	<0.001	0.550 (0.499 - 0.607)
Intubation, n	8530 (6.58%)	5895 (17.68%)	<0.001	0.328 (0.303 - 0.356)
Mechanical Ventilation, n	10140 (7.82%)	7065 (21.19%)	<0.001	0.316 (0.293 - 0.340)
Vasopressors, n	2820 (2.18%)	1855 (5.56%)	<0.001	0.378 (0.330 - 0.432)
Shock, n	8620 (6.65%)	5255 (15.76%)	<0.001	0.381 (0.351 - 0.413)
ICU, n	11315 (8.73%)	7725 (23.17%)	<0.001	0.317 (0.295 - 0.341)
Cardiac Arrest, n	440 (0.34%)	415 (1.24%)	<0.001	0.270 (0.199 - 0.367)
Mortality, n	6525 (5.04%)	3765 (11.29%)	<0.001	0.417 (0.379 - 0.457)

Citations

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