ACUTE RENAL FAILURE AND POST-ERCP COMPLICATIONS: A NATIONWIDE INPATIENT SAMPLE DATABASE ANALYSIS

Vincent Wong[1], Anjella Manoharan[1], Ahmed Ahmed[2], Faiz Afridi[2], Sushil Ahlawat[2]
[1]Department of Internal Medicine-Pediatrics, [2]Department of Gastroenterology and Hepatology
Rutgers New Jersey Medical School, Newark, NJ, 07103

Introduction

- Acute renal failure (ARF) occurs when there is recent kidney injury.
- The insult can stem from an inflammatory response, which can be seen in pancreaticobiliary diseases.
- Endoscopic retrograde cholangiopancreatography (ERCP) is a diagnostic and therapeutic tool for diseases affecting the pancreas and biliary tract.
- End stage renal disease is known to increase the risks of post-ERCP complications.
- There is a lack of evidence to evaluate the relationship between ARF and ERCP complications.

Methods

- National Inpatient Sample database was used to identify patients over 18 years old who had an ERCP procedure between 2007 - 2017.
- Patients were divided into two groups: those with and without ARF–matched by age, gender, race, ECI.
- Primary outcomes were length of stay, payor status, and total charges.
- Secondary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, perforation, and overall mortality.
- Chi-squared tests compared categorical data and independent t-tests compared continuous data.
- Multivariate analyses were performed to assess secondary outcomes.

Corresponding Email: vw112@njms.rutgers.edu
There are no financial disclosures or conflicts of interest.

Results

	Not ARF (n=206,624) (%)	ARF (n=206,893) (%)	P-Value
Age(years)	70.2 (SD=14.4)	70.4 (SD=14.4)	0.996
18-27	1868 (0.9)	1876 (0.9)	
28-37	4171 (2.0)	4182 (2.0)	
38-47	8831 (4.3)	8850 (4.3)	
48-57	22895 (11.1)	22919 (11.1)	
58-67	41093 (20.0)	41088 (19.9)	
68-77	53924 (26.1)	53939 (26.1)	
78-87	53321 (25.8)	53309 (25.8)	
>=88	20522 (9.9)	20731 (10.0)	
Gender			0.622
Male	116861 (56.6)	117170 (56.6)	
Female	89764 (43.4)	89723 (43.4)	
Race			0.995
White	144166 (69.8)	144168 (69.7)	
Black	24841 (12.0)	24961 (12.1)	
Hispanic	21651 (10.5)	21727 (10.5)	
Asian/Pac.Isd.	8288 (4.0)	8338 (4.0)	
Nat. Amer.	1215 (0.6)	1217 (0.6)	
Other	6463 (3.1)	6482 (3.1)	
ECI	12.7 (SD=9.4)	14.8 (SD=11.3)	0.992
Payor Status			< 0.001
Medicare	137356 (66.6)	141330 (68.4)	
Other	68957 (33.4)	65306 (31.6)	
Total Charges	$72,938 (SD=80,935)	$130,844.6 (SD=187,935)	< 0.001
LOS(days)	7.5 (SD=7.3)	12.1 (SD=13.2)	< 0.001

Table 1. Demographic information for patients who undergo Endoscopic Retrograde Cholangiopancreatography (ERCP) with and without Acute Renal Failure (ARF)

ARF = Acute Renal Failure
Pac.Isd. = Pacific Islander
ECI = Elixhauser Comorbidity Index
LOS = Length of Stay
SD = Standard Deviation

Post-ERCP Complication	Odds Ratio (95% CI)	P-Value
Pancreatitis	2.0 (1.8-2.2)	< 0.001
Perforation	1.9 (1.5-2.4)	< 0.001
Cholangitis	2.8 (2.4-3.1)	< 0.001
Cholecystitis	3.2 (2.5-4.1)	< 0.001
Infection	4.4 (4.1-4.7)	< 0.001
Hemorrhage	3.3 (2.7-4.1)	< 0.001
Mortality	4.9 (4.7-5.1)	< 0.001

Table 2. Outcomes of Patients who underwent Endoscopic Retrograde Cholangiopancreatography (ERCP) with Acute Renal Failure, CI = Confidence Intervals

Results

- Of 413,517 total patients, 206,893 had ARF. For both groups, 56.6% were males, and the majority of the patients were White. The ECI was 14.8 in ARF group vs 12.7 in control group and those with ARF were older (70.4 vs 70.2 years old).
- Patients with ARF had longer length of stay (12.1 days vs 7.5 days, p< 0.001), had Medicare (p< 0.001), and higher average total charges ($130,844 vs $72,938, p< 0.001).
- Secondary outcomes were significant (p< 0.001) for pancreatitis (OR 2.0), perforation (OR 1.9), cholangitis (OR 2.8), cholecystitis (OR 3.2), infection (OR 4.4), hemorrhage (OR 3.3), and mortality (OR 4.9).

Discussion

- Acute renal failure is seen in older severely ill patients, which is demonstrated by an increased length of stay, have Medicare, and higher average total charges.
- In ARF, fluctuating blood urea nitrogen and creatinine levels may lead to inaccurate calculations of mortality scores in post-ERCP pancreatitis.
- Further studies are needed to look into other scoring systems that can better predict morbidity and mortality in patients with ARF.
- ARF is an immunocompromised state that can lead to increased rates of post-ERCP infection, cholangitis, cholecystitis, perforation, hemorrhage, and mortality.
- Endoscopists should be cautious about performing ERCP in pts with ARF.