

Gender and Endoscopic Retrograde Cholangiopancreatography Complications: A Nationwide Inpatient Sample Database Analysis

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Background

- Endoscopic retrograde cholangiopancreatography (ERCP) can involve a variety of complications including pancreatitis, hemorrhage, and cholangitis
- Some studies have identified female gender as a risk factor for post-ERCP pancreatitis, cholangitis, and overall complications
- Other studies have shown contradictory results

Study Aim

- Evaluate gender as a risk factor for post-ERCP complications

Methods

- National Inpatient Sample (NIS) database was used to identify hospitalized patients over 18 years old who had an ERCP procedure between 2007 - 2017 using ICD-9 and ICD-10 codes
- Patients were divided into two groups: males or females, as defined by NIS as "indicator of sex"
- Patients were matched by age, race, and by Elixhauser comorbidity index
- Primary outcomes were rates of post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, and perforation
- Chi-squared tests were used to compare categorical data
- Multivariate analyses were performed to assess primary outcomes

Results

Demographic	Male	Female
Age (years)	Mean = 63.1	Mean = 57.1
18-27	23153	125842
28-37	42898	127192
38-47	69611	118903
48-57	118776	151063
58-67	153038	169958
68-77	154042	168059
78-87	129795	160022
>=88	35039	63010
Elixhauser Comorbidity Index		
Mean	6.8	4.7

Demographic	Male	Female
Race		
White	518714 (71%)	705053 (65%)
Black	58554 (8%)	109270 (10%)
Hispanic	91325 (13%)	189210 (18%)
Asian or Pacific Islander	29270 (4%)	36242 (3%)
Native American	4476 (1%)	7767 (1%)
Other	24012 (3%)	36506 (3%)
Total	726,352 (40.1%)	1,084,048 (59.9%)

Table 1. Demographics. 1,810,400 patients were hospitalized from 2007-2017 and underwent an ERCP procedure. Of these patients, 1,084,048 (59.9%) were female and 726,352 (40.1%) were male. Mean ages of the men and women in the study were 63.1 years and 57.1 years, respectively. Elixhauser Comorbidity Index in males was 6.8 and in females was 4.7. Racial distribution among the male and female populations was similar.

Post-ERCP Complication	P-Value	Odds Ratio	Confidence Interval
Pancreatitis	<0.001	1.20	1.14-1.27
Cholangitis	<0.001	0.74	0.70-0.80
Cholecystitis	<0.001	0.42	0.36-0.48
Infection	<0.001	0.71	0.68-0.74
Hemorrhage	<0.001	0.61	0.54-0.70
Perforation	0.304	1.06	0.95-1.20

Table 2. Post-ERCP Complications in Females vs Males. Primary outcomes were significant for increased odds ratio of post-ERCP pancreatitis (OR 1.2, p<0.001) and decreased odds ratio of post-ERCP cholangitis (OR 0.7, p<0.001), cholecystitis (OR 0.4, p<0.001), infection (OR 0.7, p<0.001), and hemorrhage (OR 0.6, p<0.001) in females compared to males. No significant difference was found between men and women for post-ERCP perforation.

Discussion



- Although there are differences in the effects of gender on post-ERCP complications in the literature, the mechanisms causing these effects are not known
- Women are known to have higher risks for biliary stones and sphincter of Oddi dysfunction which can further increase the odds of post-ERCP pancreatitis
- We postulate that the decreased rates of cholangitis, cholecystitis, infection, and hemorrhage in women compared to men could be from an anatomical variation in the biliary tree that is gender specific or increased inflammatory response
- Endoscopists should further explore and consider this possibility when performing ERCPs

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