

Effects of Race on Post-Endoscopic Retrograde Cholangiopancreatography Complications: A National Inpatient Sample Database Analysis

Anjella Manoharan, MS MD¹, Vincent Wong, MD¹, Dayna Panchal, DO², Weizheng W. Wang, MD²

¹Department of Internal Medicine-Pediatrics, Rutgers NJMS, ²Department of Gastroenterology, Rutgers NJMS

Background

- Various risk factors have been identified that increase the risk of complications of endoscopic retrograde cholangiopancreatography (ERCP)
- Complications can include hemorrhage, infection, and pancreatitis
- Limited studies have evaluated race as a risk factor for post-ERCP complications
- One study found that race was an important factor in determining risk of post-ERCP pancreatitis in women
- Other studies have described trends of ERCP in patients of different races

Study Aim

- Compare rates of post-ERCP complications among patients of different races to determine if race is a risk factor

Methods

- National Inpatient Sample 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 six groups by race identified by the Agency for Healthcare Research and Quality (AHRQ)
- Primary outcomes were the associations of race with post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, and perforation as determined by chi-squared analysis
- Rates of complications were calculated per 1,000 ERCP procedures done for each race as well to compare complications within each race

Results

Post-ERCP Complication	White	Black	Hispanic	Asian or Pacific Islander	Native American	Other	P-Value
Pancreatitis	4216 (3.40)	450 (2.68)	881 (3.13)	289 (4.36)	45 (3.65)	240 (3.90)	<0.001
Cholangitis	2364 (1.91)	333 (1.98)	409 (1.45)	226 (3.41)	26 (2.11)	154 (2.50)	<0.001
Cholecystitis	489 (0.39)	94 (0.56)	120 (0.43)	36 (0.54)	0	15 (0.24)	<0.001
Infection	5658 (4.57)	763 (4.55)	1110 (3.95)	430 (6.49)	45 (3.65)	275 (4.47)	<0.001
Hemorrhage	658 (0.53)	75 (0.45)	165 (0.59)	60 (0.91)	0	50 (0.81)	<0.001
Perforation	879 (0.71)	115 (0.69)	148 (0.53)	75 (1.13)	5 (0.41)	30 (0.49)	<0.001
Totals	1,239,056	167,859	281,136	66,264	12,317	61,586	

Table 1. Post-ERCP Complications Among Different Races. Of 1,828,218 patients who met inclusion criteria, 1,239,056 were identified as White; 167,859 as Black; 281,136 as Hispanic; 66,264 as Asian or Pacific Islander; 12,317 as Native Americans; and 61,586 as Other. Primary outcomes were significant ($p < 0.001$) when comparing the number of patients with post-ERCP pancreatitis, perforation, cholangitis, cholecystitis, infection, and hemorrhage among different races. Comparison of the rates per 1,000 ERCP procedures, which are demonstrated in parentheses, showed that Asians or Pacific Islanders were noted to have higher rates of pancreatitis, cholangitis, infection, hemorrhage, and perforation. Infection was the most common complication within each race, followed by pancreatitis.

Discussion

- We postulate that the elevated rates of post-ERCP pancreatitis, cholangitis, infection, hemorrhage, and perforation in Asians or Pacific Islanders can be attributed to the higher incidences of biliary tract pathology
- Other variations in post-ERCP complications among the different racial groups may be related to the different rates of pancreaticobiliary diseases, possibly from genetic predispositions that have not been studied yet
- The NIS database has a disproportionately large sample size of Whites compared to other racial groups, which makes the NIS database not an ideal database for this study
- Further studies with a more balanced, diverse population will be needed to better analyze these racial differences

References

- Doshi, Shreyans, et al. "Endoscopic Retrograde Cholangiopancreatography-Related Complications from the Nationwide Inpatient Sample: An Analysis of Racial Distribution, Length of Stay, and Mortality." *American Journal of Gastroenterology*, vol. 113, no. Supplement, 2018, <https://doi.org/10.14309/0000434-201810001-00764>.
- Freeman, Jennifer, et al. "Ethnicity and Insurance Status Affect Health Disparities in Patients with Gallstone Disease." *Journal of Surgical Research*, vol. 175, no. 1, 2012, pp. 1-5, <https://doi.org/10.1016/j.jss.2011.06.064>.
- Kohli, Kapil, et al. "Risk Stratification in Post-ERCP Pancreatitis: How Do Procedures, Patient Characteristics and Clinical Indicators Influence Outcomes?" *Pathophysiology*, vol. 28, no. 1, 2021, pp. 76-85, <https://doi.org/10.3390/pathophysiology28010007>.
- Mazen Jamal, M., et al. "Trends in the Utilization of Endoscopic Retrograde Cholangiopancreatography (ERCP) in the United States." *The American Journal of Gastroenterology*, vol. 102, no. 5, 2007, pp. 966-975, <https://doi.org/10.1111/j.1572-0241.2007.01127.x>.
- Tavakkoli, Anna, et al. "Regional and Racial Variations in the Utilization of Endoscopic Retrograde Cholangiopancreatography among Pancreatic Cancer Patients in the United States." *Cancer Medicine*, vol. 8, no. 7, 2019, pp. 3420-3427, <https://doi.org/10.1002/cam4.2225>.