

Introduction

- The “weekend effect” and “July effect” were studies that looked at the outcomes of endoscopic retrograde cholangio-pancreatography (ERCP) procedures, suggesting temporal relationships.
- Admissions on the weekends have been shown to lead to delays in patients with gallstone pancreatitis, while patients admitted in July had higher rates of post-procedural sepsis.
- We evaluate the effects of the “holiday effect” in December on ERCP complication rates.

Methods

- National Inpatient Sample database was used to identify hospitalized patients over 18 years old who had ERCP procedure between 2007 - 2017.
- Patients were divided into two groups: those who were admitted in December vs. other months – matched by age, gender, race, ECI.
- Primary outcome was overall mortality.
- Secondary outcomes were post-ERCP pancreatitis, cholangitis, cholecystitis, infection, hemorrhage, perforation.
- Multivariate analyses were performed to assess outcomes and independent t-tests were used to compare mortality trends by year.

Results

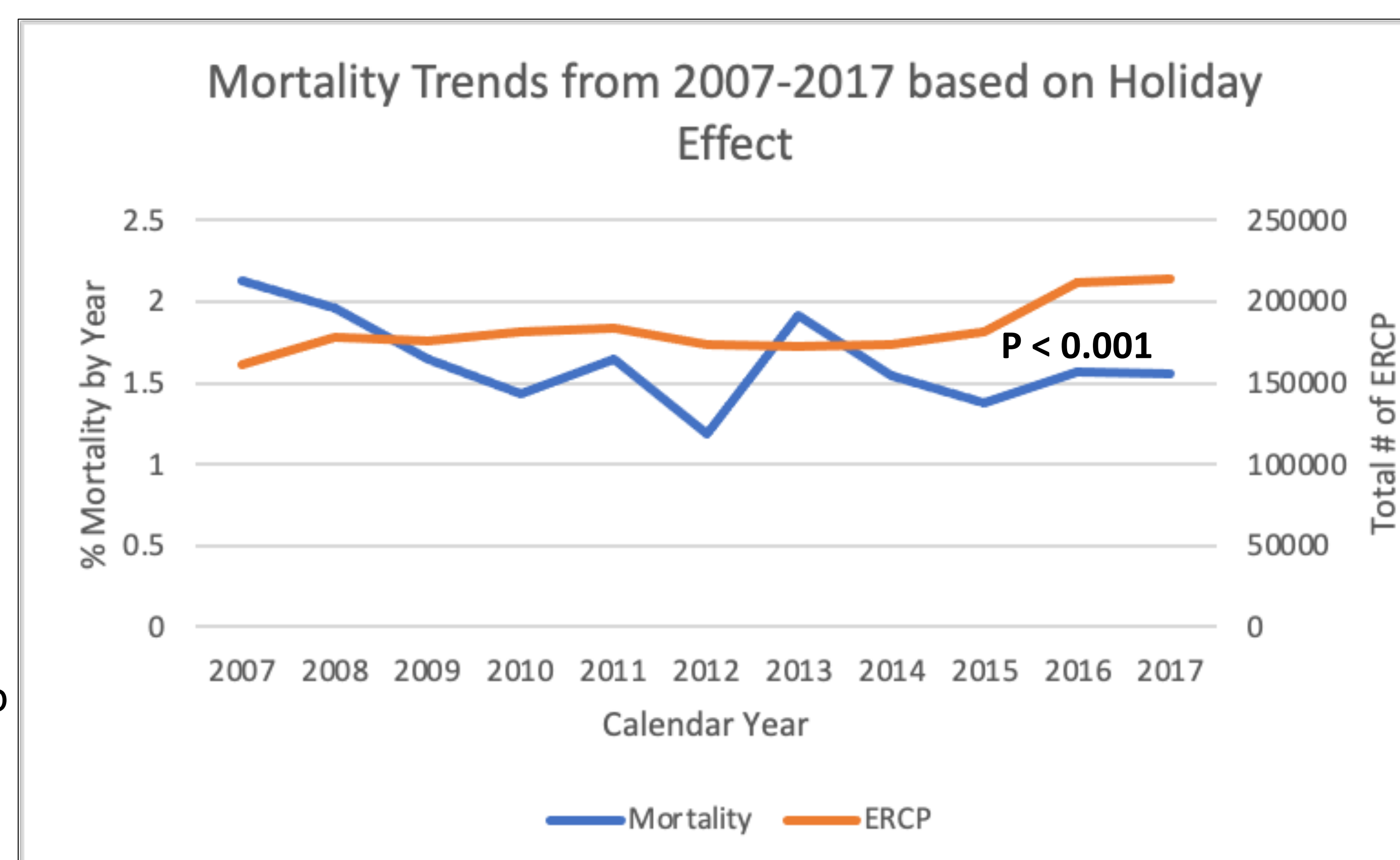
	Other Months, n=142,447 (%)	December, n=142,406 (%)	P-Value
Age	59.4 (SD=19.4)	59.5 (SD=19.4)	1.0
18-27	11228 (7.9)	11205 (7.9)	
28-37	13394 (9.4)	13348 (9.4)	
38-47	15312 (10.7)	15290 (10.7)	
48-57	21185 (14.9)	21214 (14.9)	
58-67	26123 (18.3)	26114 (18.3)	
68-77	25951 (18.2)	25966 (18.2)	
78-87	21837 (15.3)	21837 (15.3)	
>=88	7417 (5.2)	7432 (5.2)	
Gender			0.80
Male	58525 (41.1)	58574 (41.1)	
Female	83922 (58.9)	83832 (58.9)	
Race			1.0
White	96793 (68.0)	96790 (68.0)	
Black	12710 (8.9)	12706 (8.9)	
Hispanic	21596 (15.2)	21603 (15.2)	
Asian/Pac. Isld.	5504 (3.9)	5481 (3.8)	
Nat. Amer.	1065 (0.7)	1073 (0.8)	
Other	4779 (3.4)	4753 (3.3)	
ECI	5.6 (SD=9.7)	5.6 (SD=9.6)	1.0

Table 1. Demographic information for patients who undergo Endoscopic Retrograde Cholangiopancreatography (ERCP) in December versus Other Months, CI = Confidence Intervals
Pac. Isld. = Pacific Islander
Nat. Amer. = Native American
ECI = Elixhauser Comorbidity Index
SD = Standard Deviation
NS = Not Significant

Figure 1. Mortality Trends of Patients who had Endoscopic Retrograde Cholangiopancreatography (ERCP) done in December from 2007-2017

Post-ERCP Complication	P-Value	Odds Ratio (95% CI)
Pancreatitis	0.060	1.1 (1.0-1.3)
Cholangitis	0.335	0.9 (0.8-1.1)
Cholecystitis	< 0.001	1.8 (1.3-2.6)
Infection	0.315	1.1 (0.9-1.2)
Hemorrhage	0.083	1.3 (1.0-1.7)
Perforation	0.745	1.0 (0.8-1.3)
Overall Mortality	0.002	1.1 (1.0-1.2)

Table 2. Outcomes of Patients who underwent Endoscopic Retrograde Cholangiopancreatography (ERCP) in December, CI = Confidence Intervals



Results

- Of the 294,853 patients who had an ERCP between 2007 and 2017, 142,206 patients were admitted in December for the procedure.
- There was an increase in overall mortality (OR 1.1, p=0.002) for patients who had an ERCP done during December compared to other months.
- Annual trends comparing mortality rates of patients after ERCP complications were significant (p< 0.001).
- The data was significant only post-ERCP cholecystitis in December (OR 1.8, p< 0.001).

Discussion

- December is one of the busiest months due to the holidays where hospitals may be inadequately staffed and employees may have irregular hours or additional stressors, leading to a higher overall post-ERCP mortality rate.
- Patients may also choose not to have procedures done during this time, coming in only for emergent and urgent issues requiring ERCP.
- Looking at the trends from 2007 to 2017, there was an overall decrease in post-ERCP mortality, which can be attributed to improvement in endoscopic techniques and staff holiday schedules.
- Patients also had an increase in post-ERCP cholecystitis, which may be influenced by poor dietary choices.
- Endoscopists should be aware of the holiday effect.