COVID-19 Impacts Severity of Acute Cholecystitis and Emergency Presentation

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Introduction

- Worldwide efforts to combat the COVID-19 pandemic have resulted in far reaching healthcare implications beyond the immediate public health impact of the virus.
- The overwhelming patient burden and protocols to limit COVID-19 transmission resulted in innumerable missed clinic evaluations and cancellation or postponement of millions of operations which significantly delayed treatment of surgical disease.
- Early studies characterizing the presentation, severity and outcomes in surgical management of biliary disease during the pandemic have shown conflicting results.
- We hypothesized that COVID-19 impacted the severity of benign biliary disease and as a result led to an increased incidence of emergency cholecystectomy and complexity of disease.

Methods

- Retrospective review of institutional experience with elective and emergency cholecystectomies from February 2019 until February 2021, n= 1,595.
- 442 patients before the start of the COVID-19 pandemic (March 2019-February 2020) were compared to 470 patients from onset of pandemic and throughout (March 2020-February 2021).
- Excluded patients undergoing cholecystectomy during transplant, surgical oncology, trauma and pediatric surgery procedures.
- Demographic characteristics, insurance status, BMI, and ASA class were compared between groups.
- A Cochran-Armitage test for trend was used to determine the temporal impact of COVID-19 on emergency presentation, complexity of gallbladder disease, and surgical outcomes.

Results

		Pre-Covid (%)	*Post-Covid (%)*	*P-value*
Gender	Female	69.4	68.6	0.57
	Male	30.6	31.2	
	Other	0	1	
Race	White	58.1	66.3	0.008
	Black	31.2	27.6	
	Hispanic	7.5	3.2	
	Other	2.6	2.9	
ASA	1	2.3	2.3	0.67
	2	40.9	37.5	
	3	54.7	57.3	
	4	2.1	3	
Insurance Status	Charity	1.1	5.4	<0.0001
	Commerical	58.1	45.5	
	Medicaid	14.9	15.4	
	Medicare	13.8	28.3	
	Self Pay	12.1	5.4	

Table 1: Patient demographic data showing statistically significant differences in insurance status and race undergoing cholecystectomy. T test used to compare continuous variables. Chi square tests used for comparison of categorical variables. N= 912 patients

		Pre-Covid (%)	*Post-Covid (%)*	*P-Value*
Presentation	Elective	71.5	60.2	**0.0003**
	Emergent	28.5	39.8	
Use of Percutaneous Cholecystostomy Tube	No	98.1	97.1	0.31
	Yes	1.9	2.9	
Surgical approach	Laproscopic	76	74.2	0.77
	open	0.9	0.7	
	Robotic	23.2	25.1	
Subtotal Cholecystectomy	No	97	94.6	0.06
	Yes	3	5.4	
	Fenestrated	57.1	75	0.25
	Reconstituting	42.9	25	
Conversion to open	No	98.1	98	0.9
	Yes	1.9	2	
30 Day Re-admission	No	96.2	97.3	0.35
	Yes	3.8	2.7	
Complications	No	97.2	96.2	0.36
	Yes	2.8	3.9	

Table 2: Clinical outcomes between patient populations. Complications were defined as CBD injury, bile leak, infection, bleed/hemorrhage requiring OR, non-surgical adverse events (MI, stroke, or retained gallstones. Statistically significant data is labeled in bold. N= 912 patients

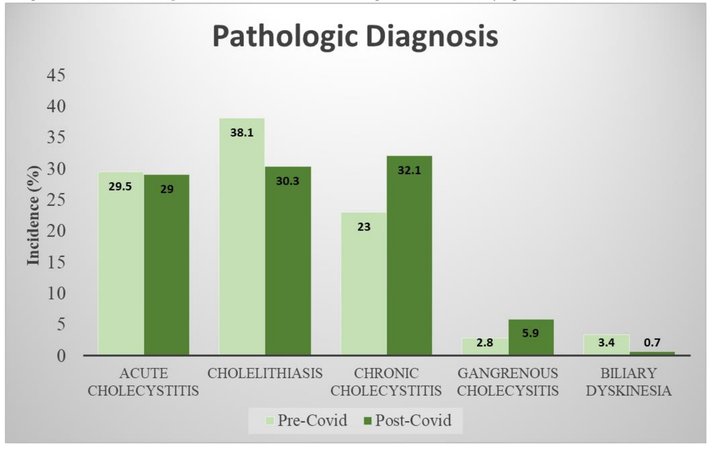


Figure 1: Graph showing a statistically significant increase in disease severity post-Covid. Pathologic diagnoses collected via final pathology reports. The four pathologies shown in the figure were the 4 most common and statistically significant (p=0.0019).

Discussion

- There were no significant differences between groups with regards to age, sex, BMI, or ASA class.
- No difference in distribution of operative approach (lap, robotic, open), rate of conversion to open procedure, complications or readmissions.
- COVID-19 significantly impacted both emergency presentation and severity of disease in a Cochran-Armitage test for trend. A significantly higher percentage of emergency presentations occurred after the start of the pandemic with significantly increased frequency of severe gallbladder disease including chronic cholecystitis and gangrenous cholecystitis.
- There was a trend towards increased rate of subtotal cholecystectomy, but this was not statistically significant.
- Black and Hispanic patients as well as uninsured patients underwent fewer cholecystectomies after the start of the pandemic which may reflect decreased access to surgical care for these historically marginalized groups.

Conclusion

- Even with increased severity of disease and emergent presentation, patient clinical outcomes did not change during the pandemic.
- The pandemic has impacted disadvantaged populations socioeconomically.
- Further investigation is needed to identify the different factors that must be addressed to alleviated further healthcare burden on vulnerable populations.

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