COVID-19 PANDEMIC'S IMPACT ON EMERGENCY GENERAL SURGERY VOLUME AT A MAJOR TERTIARY CARE REFERRAL CENTER IN THE UNITED STATES

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ABSTRACT

COVID-19 pandemic has claimed over 621,000 lives in the United States and over 4,390,000 lives worldwide. The ongoing pandemic has caused major shifts in health care resource allocation. This included a ban on elective surgery and a subsequent decrease in elective procedures during the early phase of the pandemic. We sought to quantify the effects of SARS-CoV-2 pandemic on surgical volumes for some of the most common emergent general surgery procedures. Our study found a statistically significant decline in volume of emergent general surgery diagnoses and procedures.

Background

The SARS-CoV-2 pandemic has claimed over 621,000 lives in the United States due to pneumonia and related complications. It has put a major strain on the United States' health care system, requiring the industry to reallocate its resources. This included a ban on elective surgery and a subsequent decrease in elective procedures during the early phase of the pandemic [1]. Many have studied the rationality of halting elective surgery and its economic implications [1-4]. However, the effects on Emergency General Surgery volumes have not been extensively studied.

Objectives

This study sought to quantify the effects of SARS-CoV-2 pandemic on surgical volumes for some of the most common emergent general surgical procedures.

Methods

We retrospectively analyzed data from February to April of 2020, the period that had a state-wide ban on elective surgery and compared it with same period in 2019. Data was obtained for admission diagnosis and procedures performed. The statistical analysis used the two sample T-test with equal variances, two-sample Wilcoxon rank sum test and Poisson regression to answer the research question: whether there are differences in emergency case volumes across different procedures between two-time periods (2019 and 2020). A p-value<0.05 was considered statistically significant.

Results

There was a statistically significant drop in daily emergent operations between the study period (6.13/day vs 4.64/day). A statically significant decrease in number of appendectomy, cholecystectomy, sigmoid colectomy with anastomosis, small bowel resection, operation for incarcerated and reducible hernia procedures was observed (Table 1).

Additionally, there was a statistically significant decrease in hospital admissions for appendicitis, cholecystitis, diverticulitis, skin and soft tissue infections, small bowel obstruction and GI bleed (Table 2).

Similarly, other studies show a decline in outpatient ED visits for syncope, cerebrovascular accidents, urolithiasis, and abdominal and back pain [5,6]. These studies also reported decreased visits for pediatric and elderly population.

	Number of Procedures		Daily Avg of Procedures		
Procedure	2019 (n)	2020 (n)	2019 ($\bar{x}$)	2020 ($\bar{x}$)	P-value
Appendectomy	318	242	4.24	3.14	0.0013
Cholecystectomy	678	425	8.69	5.52	<0.001
Sigmoid Colectomy with Colostomy	37	29	1.23	1.32	0.8995
Sigmoid Colectomy with anastomosis	201	109	3.65	2.42	0.0015
Endoscopic procedure for bleeding	51	31	1.38	1.35	0.5436
Small bowel resection	35	17	1.35	1	0.0124
Incarcerated Hernia	84	34	40	24	0.0121
Reducible Hernia	564	181	9.56	4.11	<0.001
Skin and Soft Tissue infection	180	133	2.81	2.46	0.2989

Table 1: Descriptive statistics for the number of emergent cases by time period

	Number of admissions		Daily average Admissions		
Admission diagnosis	2019 (n)	2020 (n)	2019 ($\bar{x}$)	2020 ($\bar{x}$)	P-value
Appendicitis	331	249	4.36	3.41	0.0085
Cholecystitis	596	463	7.64	6.01	0.0009
Diverticulitis	93	53	1.9	1.43	0.0268
SSTI	460	337	6.13	4.64	<0.001
Small bowel obstruction	478	362	6.13	4.64	<0.001
GI bleed	725	597	2.86	3.06	<0.001
Incarcerated Hernia	68	48	1.58	1.23	0.1840

Table 2: Descriptive statistics for the number of admissions by time period

Conclusion

While elective surgical procedures saw a noticeable decline in volume during the early phase of the COVID-19 pandemic, similar effect on emergency general surgery procedures and hospital admissions was observed at a major tertiary care referral center. This trend is consistent across medical specialties. Further studies are needed to understand the phenomenon which perhaps discouraged patients to seek appropriate care.

References

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