

Increasing Incidence of Complicated Appendicitis during the COVID-19 Pandemic

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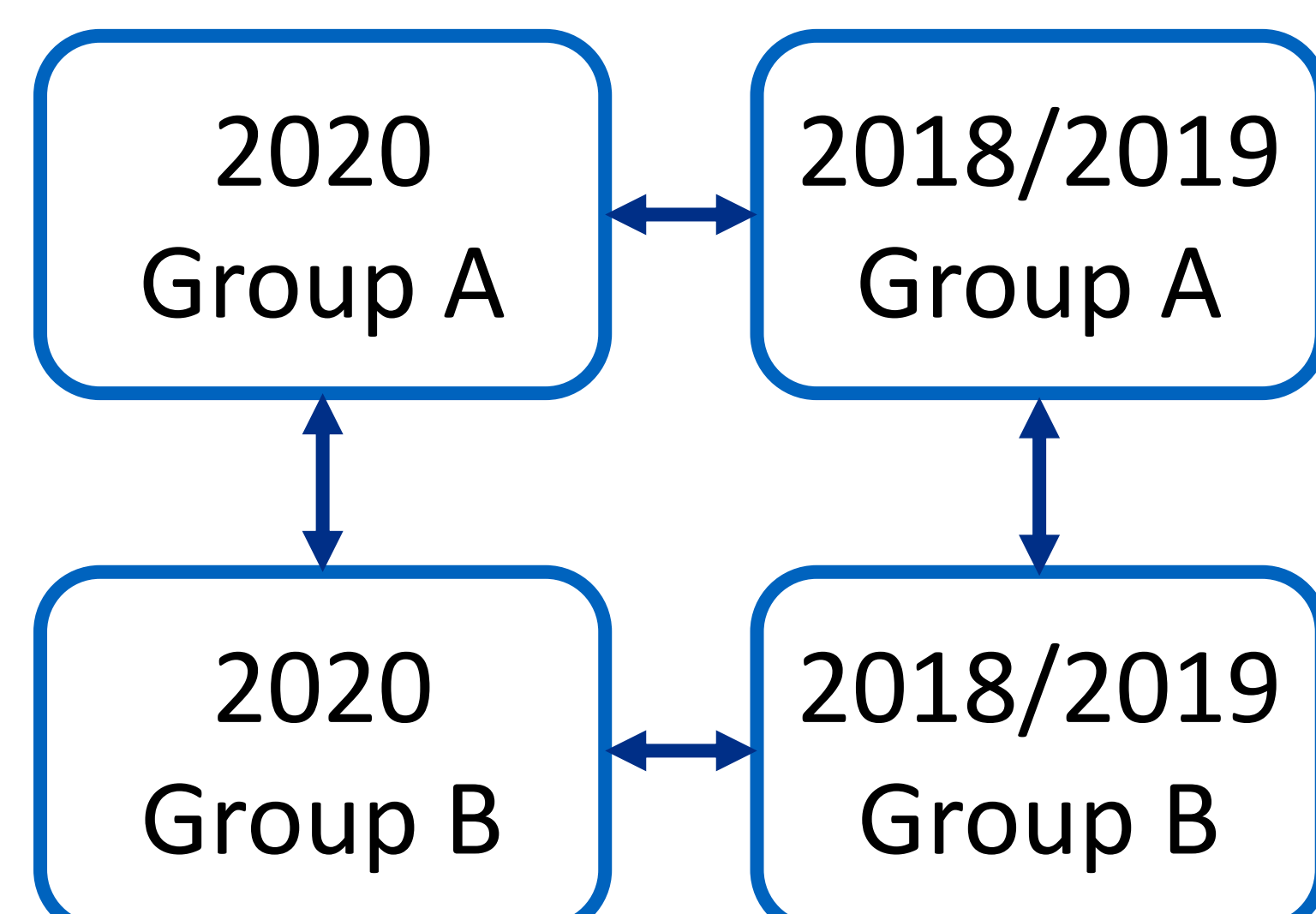
INTRODUCTION/OBJECTIVES

The first COVID-19 patient in the US was reported on January 20, 2020. In response, many states initiated stay-at-home advisories and postponement of elective surgeries. This resulted in a decrease of up to 50% in patients seeking emergency care.

The aim of this study was to evaluate if the COVID-19 restrictions resulted in a significant impact on both the number of patients presenting to the ER with acute appendicitis as well as their disease burden.

METHODS

- Retrospective cohort investigation
- All adult and pediatric patients with acute appendicitis from 1/1/2018 to 4/30/2020 were included
- Two time groups (2020 Groups A and B) were created based on the directive for postponement of elective surgeries in Massachusetts (March 15, 2020). These were compared to similar groups from 2018/2019
- Logistic regression was used for all outcomes. Absolute differences across each time period and difference-in-difference between different time periods were calculated



- Group A: 2/1–3/15 (6 weeks before)
- Group B: 3/16–4/30 (6 weeks after)
- 2020 Groups A and B compared to determine affect of COVID-19

RESULTS

	Baseline Time Period			COVID Time Period			
	2018/2019 Group A N (%)	2018/2019 Group B N (%)	Absolute Difference (95% CI)	2020 Group A N (%)	2020 Group B N (%)	Absolute Difference (95% CI)	Difference in Difference (95% CI)
Uncomplicated, acute Appendicitis:	75 (80.7)	74 (81.3)	0.6% [-10.6, 12.0]	43 (89.6)	15 (44.1)	-45.5% [-64.2,-26.7]	46.1% [24.2, 68.1]
Abscess:	1 (1.1)	3 (3.3)	2.2% [-2.0, 6.4]	1 (2.1)	3 (8.8)	6.7% [-3.6, 17.0]	-4.5% [-15.7, 6.6]
Perforated Appendicitis:	13 (14.0)	14 (15.4)	1.4% [-8.8, 11.6]	4 (8.3)	10 (29.4)	21.1% [3.9, 38.3]	-19.7% [-39.7, 0.3]
Gangrenous Appendicitis:	7 (7.5)	4 (4.4)	-3.1% [-9.9, 3.7]	3 (6.3)	12 (35.3)	29.0% [11.5, 46.5]	-32.1% [-50.9, -13.4]

^aVariations in number are due to patients having more than one post-operative diagnosis.

Table 1: Comparison of postoperative diagnosis. Orange box denotes statistical significance.

	2018/2019	2018/2019	Absolute Difference (95% CI)	2020	2020	Absolute Difference (95% CI)	Difference in Difference (95% CI)
	Group A	Group B		Group A	Group B		
	N (%)	N (%)		N (%)	N (%)		
Laparoscopic Appendectomy:	92 (97.8)	89 (92.7)	-5.1% [-11.1,0.8]	47 (87.0)	32 (86.5)	-0.5% [-14.7,13.6]	-4.6% [-20.0,10.8]
Open Appendectomy:	1 (1.1)	2 (2.1)	1.0% [-2.5,4.5]	1 (1.9)	0 (0.0)	-	-
Abdominal washout and drain placement:	0 (0.0)	0 (0.0)	-	0 (0.0)	2 (5.4)	-	-
Antibiotics:	1 (1.1)	5 (5.2)	4.1% [-0.7,9.0]	6 (11.1)	3 (8.1)	-3.0% [-15.1,9.1]	7.1% [-5.9,20.2]

Table 2: Comparison of treatment modalities.

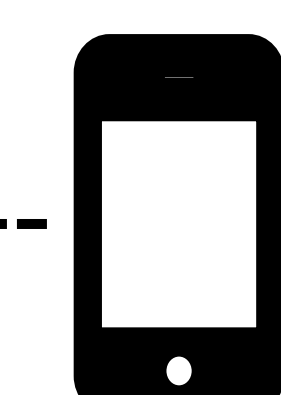
LIMITATIONS

- Single institution study, relatively small volume of patients
- Study groups were selected based on Massachusetts date of postponing elective surgeries

CONCLUSIONS

The significant increase in the incidence of complicated appendicitis during the COVID-19 crisis could indicate that patients requiring urgent surgical intervention are not seeking timely and appropriate care.

It is prudent to address patient fears and emphasize the need to seek care in a timely manner during future COVID-19 surges.



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- 281 patients - 180 adult, 101 pediatric
- No significant difference in demographics, comorbidities, preoperative lab values, or vitals
- A significant decrease in patients diagnosed with uncomplicated, acute appendicitis was identified (Table 1)
- A significant increase in patients with postoperative diagnosis of perforated or gangrenous appendicitis (Table 1)
- Less patients were treated with antibiotics alone after the implementation of COVID-19 related restrictions (Table 2)