

Acute Appendicitis During COVID-19: Changing Clinical Presentation And Outcome

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ABSTRACT

Background: Acute Appendicitis is the most common surgical emergency. Worldwide Quarantine was advised by many countries during this pandemic period of COVID 19 to prevent mortality and disease dissemination. As the result even for acute conditions seeking medical consultations were delayed and ended with more complications.

Objectives: To compare the presentation of Acute Appendicitis before and during the COVID-19 pandemic, Grade of presentation of Acute Appendicitis before and during the COVID19, Postoperative complications before and during the COVID-19 pandemic.

Methodology: This is a retrospective observational study. Patients admitted in Tirunelveli medical college hospital, Department of General surgery with a clinical diagnosis of Acute Appendicitis for three months from January 2020 to March 2020(before the COVID -19 Pandemic) and April to June 2020(During the COVID-19 pandemic) were included in the study. Total there were 155 cases of appendicectomy done during this period.

They were classified according to the time of the appendicectomy, before the declaration of the state of alarm (non - COVID-19), and after its declaration in India, one the most affected countries in the world. An evaluation was made of demographic variables, type of appendicitis, hospital stay, and postoperative complications and outcome.

Results: A total of 155 Cases of Acute appendicitis was evaluated: 55 (32%) from the acute pandemic period and 105 (68%) from the non-pandemic period. No statistical difference in the male: female ratio and demographic pattern. But the high severity score for the appendicitis diagnosed in the pandemic period was 90% and for the same in the non COVID period was only 56% ($p=.004$) The number of cases reported in the hospital during the pandemic period is drastically reduced ($P=.028$), but the cases presented were with more advanced state of complication and had relatively more duration of hospital stay .71% of cases presented were had grade 1 and 2 diseases in the pre pandemic period and grade 3 and 4 cases in the pandemic period.

Conclusion: As the delay in visiting and seeking medical help, the disease progressed and as a result the outcome of therapeutic intervention is less positive. Hence adequate steps for hassle-free inflow of people in need of surgical care in this pandemic must be given priority and regulated.

Keywords: Acute Appendicitis, SARS-CoV-2, COVID-19

INTRODUCTION

Coronavirus disease (COVID19) is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which started in December 2019 as an epidemic in Wuhan, China. On March 11, 2020, the World Health Organization (WHO) declared it as pandemic after

reaching more than 114 countries. ⁽¹⁾ In India there is as on date 1910681 cases reported with 39856 deaths. ⁽²⁾ Droplet transmission from an infected person to another is the main way of disease transmission. ⁽³⁾ SARS-CoV2 virus has spread around the globe, and cases of COVID- 19 continue to rise. The world in which we live has dramatically

changed, and this in turn has changed us. COVID19 (SARS-CoV-2) has caused major disruption to healthcare practices globally. The reality of pandemic rapidly overwhelming healthcare systems has been alarming and countries earlier in their curves have sought to implement the lessons from other experiences.

Surgery is among the many services impacted by re-structuring to provide surge capacity in India. Since the commencement of our national mitigation phase in March 2020, with subsequent escalation to lock-down on March 24th, elective care has been reduced to only those come with acute emergency. One of this is Acute Appendicitis, which is among the most common causes of abdominal pain and surgical emergency throughout the Globe. ⁽⁴⁾ The risk of developing acute appendicitis is proposed to be 6.7 % in females and in males it is 8.9. ⁽⁵⁾ Appendicitis can have a rapid evolution, with perforation rates of 10% to 30 %. Early appropriate diagnosis using Alvarado score, USG or CT Scan and prompt management is important to curtail the evolving complications such as Appendicular abscess, gangrene and perforation. ⁽⁶⁾ Appendicular perforation is associated with increased mortality and morbidity when compared with non-perforated appendicitis.

We hypothesized that during this pandemic period, the number of people reporting to casualty is reduced as transport facility and lock down difficulties persists and also for the people coming with symptoms in the casualty department was delayed and are in advanced stage of the disease. The purpose of this study is to compare the presentation of Acute Appendicitis, and its complications, and duration of hospital stay during the pre COVID pandemic and during this pandemic period.

AIM AND OBJECTIVE

AIM:

Aim of this study is to analyse the difference in the quantity, quality and

outcome of cases of appendicitis reported for treatment between the pre pandemic and pandemic period

OBJECTIVES:

To compare the

1. Presentation of Acute Appendicitis before and during the COVID-19 pandemic.
2. Grade of presentation of Acute Appendicitis before and during the COVID-19
3. Post-operative complications before and during the COVID-19 pandemic

METHODOLOGY

Study population:

All Patients admitted in Tirunelveli medical college hospital Department of General surgery with a clinical diagnosis of Acute Appendicitis between for three months from January 2020 to March 2020(before the COVID -19 Pandemic) and April to June 2020 (During the COVID-19 pandemic) and who had undergone appendectomy were included .Data collected from the case sheets maintained in the college and 5 cases with insufficient data were not included .Out of total 155 cases included in the study, there were 105 cases of Appendicitis in the non-pandemic period and 50 cases operated in the pandemic period. The demographic data, grade of diseases with which presented, intraoperative procedure, post-operative hospital stay, and complications were studied.

STUDY DESIGN:

Retrospective and prospective observational study was conducted on patients operated on for Acute Appendicitis from January 2020 to June 2020. They were classified according to the time of the appendectomy, before the declaration of the state of alarm (pre- COVID-19), and after its declaration in India, third most affected one the most affected country in the world. An evaluation was made of demographic variables, type of appendicitis, hospital stay, and postoperative complications.

Based on the USG, CT Scoring the cases were graded as follows

1. Probable appendicitis,
2. Appendicitis,
3. Appendicitis with peri-appendicitis,
4. Appendicitis with rupture,
5. Complicated appendicitis. (7)

The socio demographic variables like age, gender and BMI were noted

The ethical consent was obtained from the institutional ethical committee and the hospital case seats were used for the data collection

Statistical analysis was performed using SPSS 20. Univariate analysis results are calculated with a mean and SD or percentage. Statistical significance was considered when $P < .05$.

RESULTS

Total patients undergone surgeries during this period were 155 and respectively 105 in the pre pandemic period and 50 in the pandemic period were included.

In both the group the percentage of male vs female were 70:30 and 68:32 and it

is not statistically significant. ($p=.678$).The values in both the periods are tabulate din Table 1.

Table 1. Demographic profile.

Factor	Pre pandemic period (n=105)	Pandemic period (n=50)	P value
Age, mean (SD)	35.2 (17.88)	34.6(16.99)	.678
Gender- Men	73 (70%)	34 (68%)	.234
Women	32 (30%)	16 (32)	

When compared with females, Males are most commonly affected in both the period. 69 % males and 31 % females are affected in this study which is statistically significant.

The grades of appendicitis as per the grade shown above were studied for the Pre pandemic and pandemic periods and data are tabulated in Table 2 and Figure 1.

71.4 % of cases in the pre pandemic periods belong to Grade 1 and 2 of appendicitis, but in the pandemic period 68% of cases were belong to grade 3 and 4 comprising Appendicular perforation and appendicular abscess and it is statistically significant, ($p-.004$).

Table 2: Grade of appendicitis in both the periods

	Probable Appendicitis Grade 1	Appendicitis Grade 2	Appendicitis/perforation Grade 3	Appendicitis with Abscess Grade 4	Appendicular Mass Grade 5	P value
Pre-Pandemic period(n=105)	10 (9.5%)	65 (61.9%)	12 (11.42%)	6 (5.7%)	12(11.4%)	0.004
Pandemic period(n=50)	1 (2%)	10 (20%)	18 (36%)	16 (32%)	5(10)	

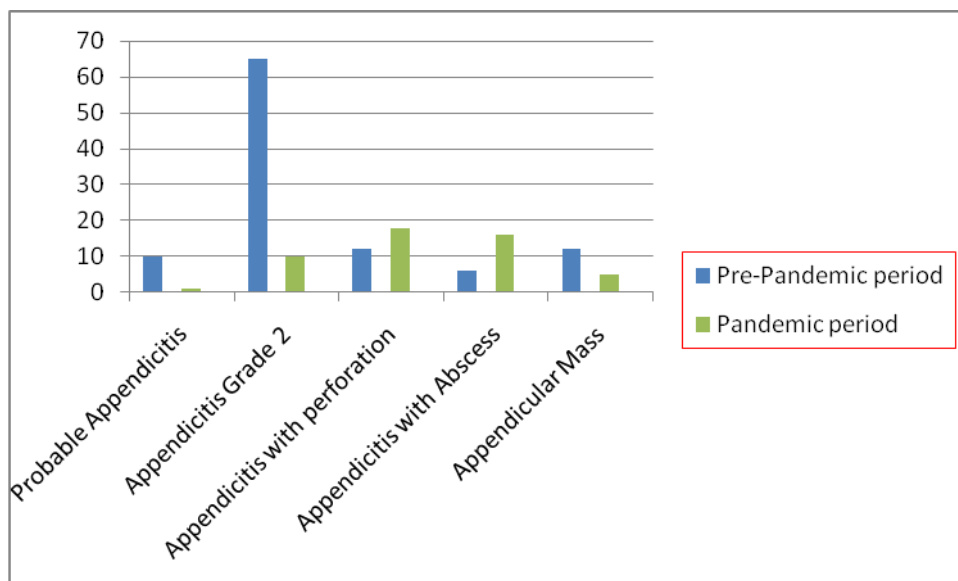


Figure: 1 Grades of appendicitis in both periods

The male female involved in each grade of the appendicitis various grades are depicted in figure 2. In all grades, males are involved more than the females.

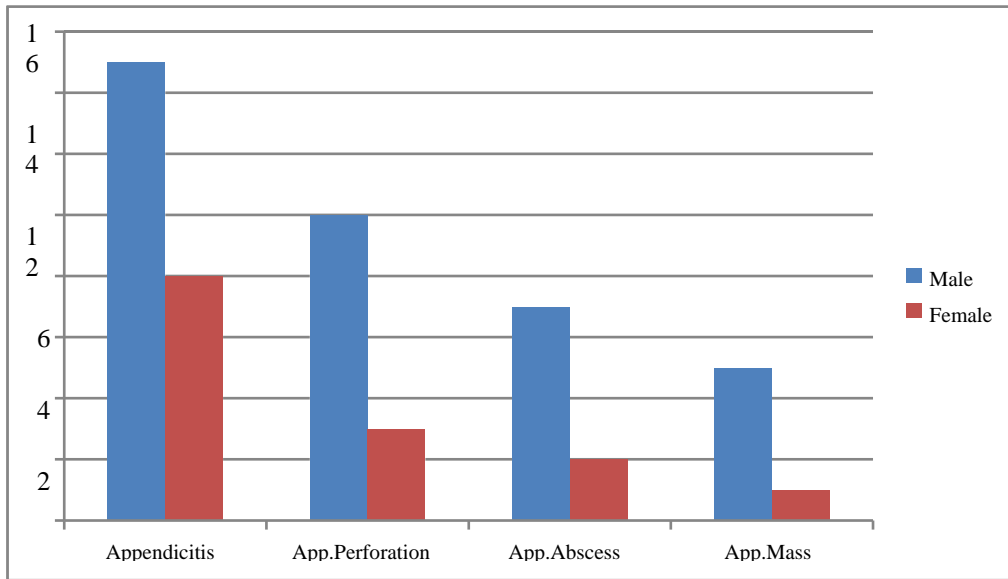


Figure 2: Sex distribution in different grades

The grades of appendicitis in different age groups are tabulated and shown in the figure 2 and it is noted as the age increases relative complications are also increasing. However, there is no statically significant in the age between two groups. Appendicular perforation is most common in old age and it is statistically significant

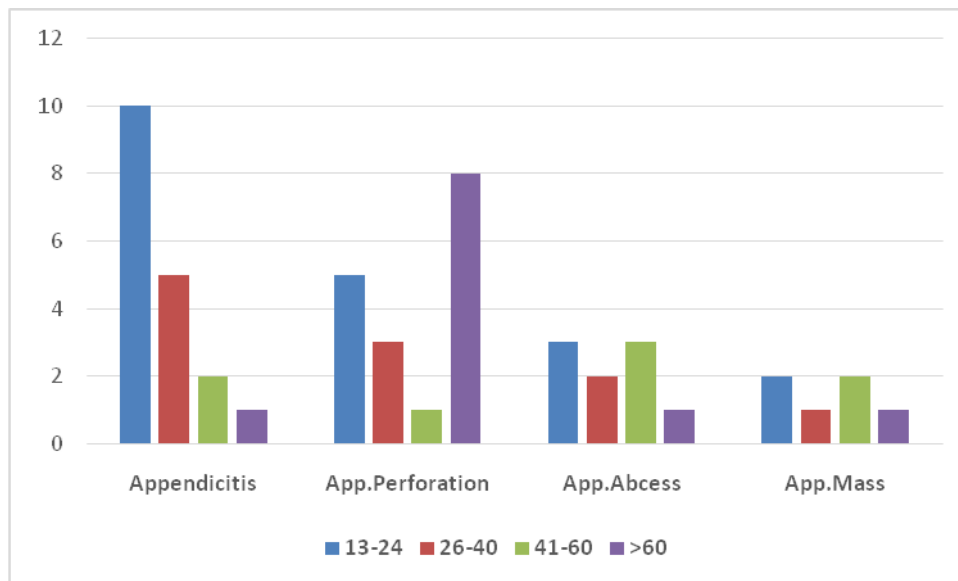


Figure 3: Age wise distribution of different grades of patients

The duration of hospital stays for the patients admitted in the pre pandemic and pandemic periods were analyzed and tabulated in Figure 4. The mean hospital stay was 5 days in pre pandemic period and 8.1 in pandemic period and this is statistically significant. (p=.0124)

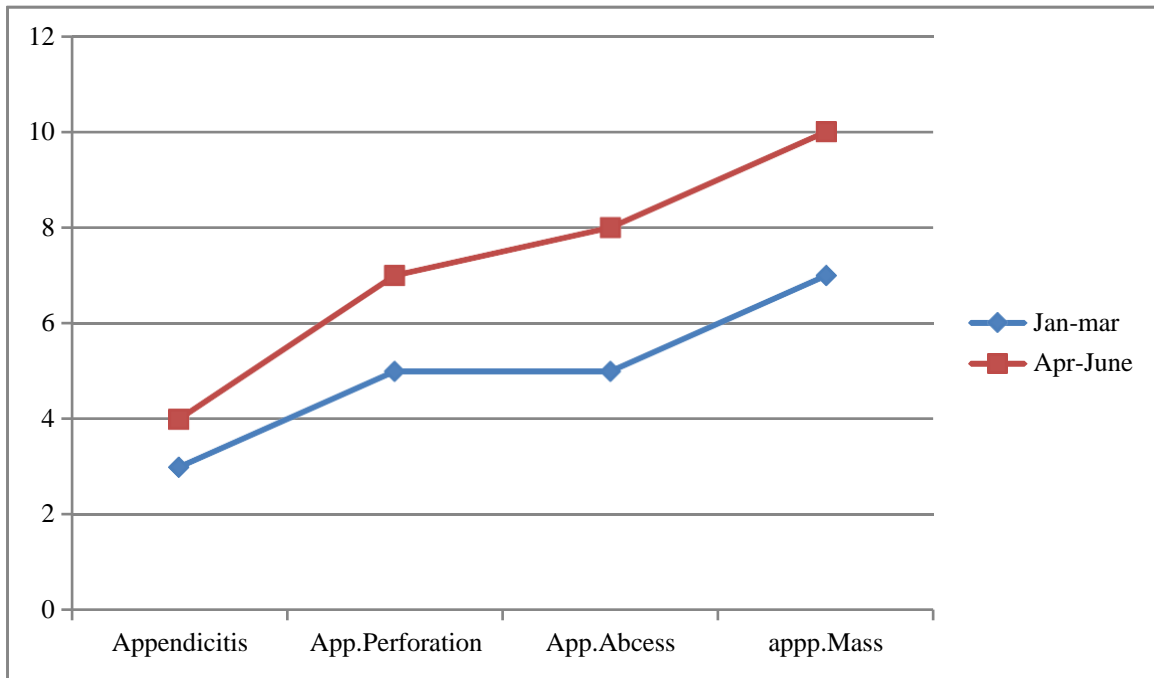


Figure 4: Duration of hospital stay before and during COVID-19 period.

The recovery and post-operative complications especially SSI were compared and the results were shown in the Table 3. The incidence of SSI was significantly low in pre pandemic period and there is 4.7% of cases had SSI, however in pandemic period there were 36% cases had SSI. (p=.0001)

Table 3: Post operative complications before and during COVID-19 periods.

	SSI	Mean Hospital stay	Mortality
Pre Pandemic period (n=105)	5 (4.76%)	5 days	0 (0 %)
Pandemic period(n=50)	18 (36%)	8.1 days	1 (2%)
P value	.0001	.0124	
Chi-square value	40.625.0	6.5911	

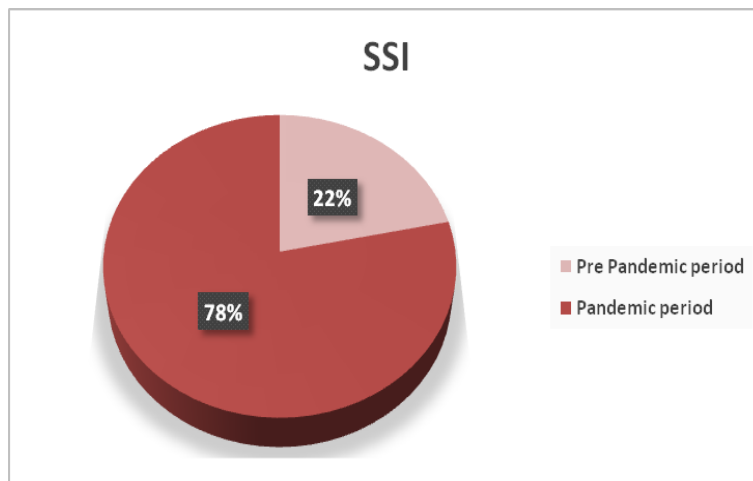


Figure 5: SSI in before and during COVID-19 period

DISCUSSION

The SARS-Cov-2 pandemic influenced the time of diagnosis of appendicitis, as well as its course, and mean

hospital stay. As a result of the significant circumstances, delaying diagnosis and treatment of Acute Appendicitis during SARS-Cov-2 pandemic, inappropriate

management of this common surgical disorder has been noticed.

Various factors play in reporting late to the hospital during the development of pain abdomen in this pandemic. Ori Snapiri et al in their study reported the fear of contracting the COVID-19 in public places such as hospital or casualty, inadequate clinical examination in the hospital setup with more of telemedicine concepts resulting in misdiagnosis are quoted as primary reasons. ⁽⁸⁾

Lazerini M et al have stated in their study conducted in Italy there is nearly 75 to 80% of reduction of cases of acute abdomen during the pandemic period and postulated it reflects the scarcity of the resources available as a result of pandemic based redistributions and the fear grip of the people to get exposed to corona infections in the hospitals. ⁽⁹⁾

The number of cases reported during this pandemic with acute appendicitis is comparatively reduced a lot for these reason with the pre pandemic period. In our study there is reduction in nearly half the number of cases in the pandemic period versus pre pandemic period. Javier et al have reported in their study from Colombia, of 196 patients, 141 from the pre pandemic period and only 55 from acute pandemic period. ⁽¹⁰⁾

As the result of these delays in presentations the severity with which they

present to the hospitals were also increased tremendously. In the pre pandemic period 71% of the acute appendicitis was presented in the grade 1 or 2, belonging to mild cases, but in the pandemic period nearly 68% presented with grade 3 and 4 diseases comprising appendicular abscess and perforation.

Few other studies reported during this period by H. Javanmard-Emamghissi et al and Javier Romario et al also confirm the similar findings in their study. ⁽¹¹⁾

As the result of the delay in presentation and the laparoscopic management is not adopted due to the restriction imposed by the corona infection to reduce the operative time, the hospital stay in the post-operative period and also the rate of infection as counted by the number of SSI noted were also high. ⁽¹²⁾

CONCLUSION

The fear from COVID-19 pandemic may result in delayed diagnosis and higher complication rates in common medical conditions. We believe caregivers and healthcare providers should not withhold necessary medical care since delay in diagnosis and treatment in these routinely seen medical emergencies may become as big of a threat as COVID-19 itself.

TAKE HOME POINTS

- During this COVID 19 period, more number of patients approaching healthcare system in advanced condition.
- Delay in their presentation makes them delay of returning home.

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