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The Saga of Non-COVID Patients in COVID Times: Our Experience in a Secondary Care Hospital in Hilly Terrain, Northern India

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Abstract

Background: The coronavirus disease 2019 (COVID-19) pandemic resulted in the diversion of all the resources, attention, and energy of the medical personnel and administration towards the management of COVID-19 patients. This resulted in unforeseen difficulties and hazards for non-COVID-19 patients in accessing healthcare professionals and facilities.

Objectives: The objective of this study was to analyze the impact of the COVID-19 pandemic and repeated lockdowns on the non-COVID patients; to understand the social, psychological, and medical issues faced by them; and propose solutions for difficulties faced by this specific cohort of patients.

Methods: We conducted a retrospective observational study on all non-COVID patients reporting for non-COVID-19 illnesses. We conducted the data analysis by comparing the trends for 15 months each in the pre-pandemic (1 January 2019 to 31 March 2020) and pandemic periods (1 April 2020 to 30 June 2021).

Results: There was a 65.92% decrease in Out Patient Department (OPD) attendance, a 56.05% decrease in admissions, and a 90.33 % decrease in elective surgical procedures in non-COVID-19 patients. However, there was a significant increase in emergency surgeries by 62.16%.

Conclusion: There has been a significant albeit much-needed diversion of time, energy, and resources to manage COVID-19 patients in recent times. This has led to a paucity of care opportunities for non-COVID-19 patients, which has been further compounded by the frequent lockdowns. We attempted to understand the impact of the pandemic on non-COVID-19 patients, particularly in peripheral hospitals in Hilly Terrains. We propose the solutions to tackle these issues and describe our experience with them.

Keywords: COVID-19 Pandemic, Environmental Exposure, Primary Healthcare, Hospital Administration

1. Background

It has been widely believed and simultaneously refuted that the coronavirus disease 2019 (COVID-19) pandemic initially started as an outbreak in the city of Wuhan, China in December 2019. Due to the high infectivity rate, it quickly evolved into a global pandemic.[1,2] The World Health Organization (WHO) named the new strain of coronavirus as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and recognized the outbreak as public health emergency of international concern on 30 January 2020[3] and declared it a pandemic on 11 March 2020.[4] Till 30 June 2021, there have been 30 326 659 cases of COVID-19 in India and 182 306 263 cases in the world.[5]

This staggering number of patients has prompted governments across the globe to direct all their resources, manpower, and funds towards containing this pandemic.[6] This concentrated effort towards pandemic, though justified as the need of the hour, resulted in inadvertent neglect of the non-COVID-19 patients. It is also widely known the novel coronavirus has higher infectivity rates as well as complications amongst patients with pre-existing non-communicable diseases such as diabetes mellitus, cardiovascular disorders, bronchial asthma, and chronic renal disorders.[7] Hence, it is even more imperative to understand the problems faced by these patients in COVID-19 times.

Our hospital is a 100-bedded secondary care facility located in the Himalayan Mountain range at an altitude of approximately 1800 meters. It provides health care services to an approximate population of 25 000. The hospital has a physician, surgeon, gynecologist, pediatrician, ophthalmologist, and otorhinolaryngologist in addition to non-specialist doctors. The hospital also had an arrangement of fortnightly visits by dermatologists and psychiatrists from local resources which unfortunately stopped at the onset of the pandemic due to lockdown which also added to the woes of the non-COVID patients.

At the onset of the COVID-19 pandemic, the hospital administrators began resource aggregation and strategic planning for better handling of the pandemic. A 'flu clinic'

was established outside the main hospital building and the hospital building was divided into various COVID-19 and non-COVID-19 zones. The hospital had in-house testing facilities for COVID-19 which assisted in the screening of the patients. Under the guidelines promulgated by the Government of India and WHO,[8] the hospital conducted COVID-19 tests for all symptomatic patients and their primary contacts. The hospital also conducted COVID-19 tests for all patients prior to their admission to the hospital for non-COVID-19 conditions. No routine COVID-19 testing was performed for outpatients who did not exhibit symptoms related to COVID-19.

2. Objectives

The authors conducted this retrospective study to analyze the impact of the COVID-19 pandemic on the non-COVID-19 patients reporting to our hospital. There have been few original studies conducted earlier on the plight of the non-COVID-19 patients[9,10] in Indian or foreign literature. However, the authors could not find any studies conducted in peripheral hospitals or Hilly Terrain. The authors also propose solutions to the problems of non-COVID-19 patients and our experience with these measures which can be adopted by other institutes in the future to handle any subsequent waves of the pandemic. Our hospital had a unique setting for this study as it is situated in the Hilly Terrain where the climactic conditions made it challenging to tackle the pandemic.

3. Methods

The authors conducted this retrospective observational study at our secondary care hospital in Northern India. The hospital is located in the Hilly Terrain with a subtropical highland climate. It provides healthcare services to approximately 25 000 people. Unfortunately, this location is prone to inclement weather with frequent, incessant rains, snowfalls, hailstorms, and landslides.

The authors collected the data for the study from the records of the hospital in respect of all the non-COVID-19 patients visiting the Out Patient Department (OPD), hospital admissions, and surgical procedures from the Departments of Internal Medicine, Surgery, Obstetrics & Gynaecology, Paediatrics, Otorhinolaryngology, and Ophthalmology. The data were compiled separately for the pre-pandemic and the pandemic periods. The authors included all non-COVID-19 patients in the study, including both outpatients and inpatients. All proven COVID-positive patients were excluded from the study. The authors analyzed the data by comparing the trends in the pandemic period for 15 months (1 April 2020 to 30 June 2021) and the pre-pandemic period of a similar length of time (1 January 2019 to 30 March 2020). The authors did not undertake a sample size calculation as this was a retrospective study, and all non-COVID-19 patients visiting the hospital were included in the study.

In addition, the authors collected the data on immunization programs running in the hospital under the Universal Immunization Program (UIP). Finally, the authors conducted a questionnaire-based interview of the doctors in our hospital to understand the challenges faced by non-COVID-19 patients perceived by the doctors.

The authors, meanwhile, separately studied the change in trends of OPD visits and hospital admissions for chronic conditions during the first six months, subsequent six months, and final three months of the study period (i.e., 01 April to 30 September 2020, 1 October to 31 March 2021 and 1 April 2021 to 30 June 2021). The authors selected these durations considering the strict nationwide lockdown in India and onset of the first peak during the first six months, resolution of the first peak followed by a lull period during the subsequent six months, and a sharp second wave during the final three months of the study period. The authors did this with the aim of correlating the hospital data with the peaks and lull periods of the pandemic.

The authors performed statistical analysis using SPSS statistical software (SPSS, Chicago, IL) software version 23.0. Descriptive statistics are presented in frequencies and percentages for categorical variables. No advanced statistical tests were required for the present study.

4. Results

A total of 28 750 non-COVID-19 patients visited the hospital OPD from 1 January 2019 to 30 March 2020, but as the COVID-19 pandemic hit the country, this number decreased by 65.92% to 9797 through 1 April 2020 to 30 June 2021. A department-wise distribution for OPD attendance has been depicted in Table 1.

A total of 1479 non-COVID-19 patients were admitted to the hospital wards from 1 January 2019 to 30 March 2020. During the pandemic, this number decreased by 56.05% to 650. Department-wise distribution for hospital admissions

Table 1. aComparison of Outpatient Visits, Hospital Admissions, and Elective Surgeries in Pre-pandemic and Pandemic Periods

	Time period	Medicine No. (%)	Surgery No. (%)	Obs and Gyn No. (%)	Pediatrics No. (%)	Ophthalmology No. (%)	Otorhinolaryngology No. (%)	Total No. (%)
Outpatient visits	Pre-pandemic	8834 (100)	5802 (100)	2845 (100)	3892 (100)	5283 (100)	2094 (100)	28750 (100)
	Pandemic	2431 (27.51)	2032 (35.02)	997 (35.04)	2314 (59.45)	1251 (23.67)	772 (36.86)	9797 (34.07)
Hospital admissions	Pre-pandemic	364 (100)	468 (100)	170 (100)	69 (100)	232 (100)	176 (100)	1479 (100)
	Pandemic	255 (70.05)	208 (44.44)	71 (41.76)	32 (50.72)	37 (15.94)	47 (26.70)	650 (43.94)
Elective surgeries	Pre-pandemic	-	124 (100)	92 (100)	-	300 (100)	84 (100)	600 (100)
	Pandemic	-	14 (11.29)	20 (21.73)	-	16 (5.33)	8 (9.52)	58 (9.66)

for non-COVID-19 patients has been depicted in Table 1. This fall in admissions was most acute for ophthalmology and otorhinolaryngology, which experienced falls of 84.05% and 73.29%, respectively, likely due to the predominantly chronic nature of patients visiting these departments.

A total of 600 patients underwent major elective surgical procedures in the pre-pandemic period. This number reduced by 90.33% to 58 over a similar period during the pandemic. However, there was an increase in emergency surgeries by 62.16% (from 74 in the pre-pandemic period to 120 in the pandemic period). Department-wise distribution for elective surgeries is depicted in Table 1. There was a disproportionate impact on ophthalmological and otorhinolaryngology surgeries as most of them were deemed non-urgent and hence stopped altogether. Only a few surgical cases related to trauma were operated on during the pandemic period in these two departments. There was also a mild reduction in immunization under UIP, which fell by 12.17% during the pandemic period. The percentage reduction in the various study parameters is summarized in Figure 1.

Table 1 shows the demographic details of outpatients, inpatients, and surgical cases during pre-pandemic and pandemic periods. Table 2 shows the demographic information of the study population.

The analysis of the data correlated with the peaks and lull periods of the pandemic revealed that the decrease in the presentation of chronic non-COVID-19 conditions to the hospital was most acute during the first six months and last three months of our study period due to COVID-19 related restrictions. These periods corresponded to the first and second waves of the pandemic. A corresponding increase was observed in the presentation of non-COVID-19 patients to the hospital in the intervening six-month period, which was the lull period between the two peaks. There was also an increase in the chronic non-COVID-19 conditions presenting with emergencies to the hospital during this lull period. These findings are summarized in Figures 2 and 3 indicating the reduced access to healthcare for chronic non-COVID-19 conditions during the pandemic.

5. Discussion

COVID-19 pandemic has swept the world for the one and a half last year. The medical fraternity, as well as patients, have faced unprecedented and unforeseen challenges during this period.[11] The social, physical, mental, psychological, financial, and medical implications of this pandemic over the general population necessitate a novel approach for solutions to efficiently manage non-COVID-19 patients.

Our retrospective observational study shows a drastic reduction in the OPD visits, hospital admissions, and the number of surgical procedures performed. A similar reduction in hospital visits has been reported by Hartnett et al who described a 42% reduction in visits to the emergency department by non-COVID-19 patients[12] across the United States. Similar findings were experienced in Italy by Lazzerini et al.[13] Kapsner et al reported a 35% reduction in hospital admissions across 18 university hospitals in Germany.[14] Our reduction in the footfall of

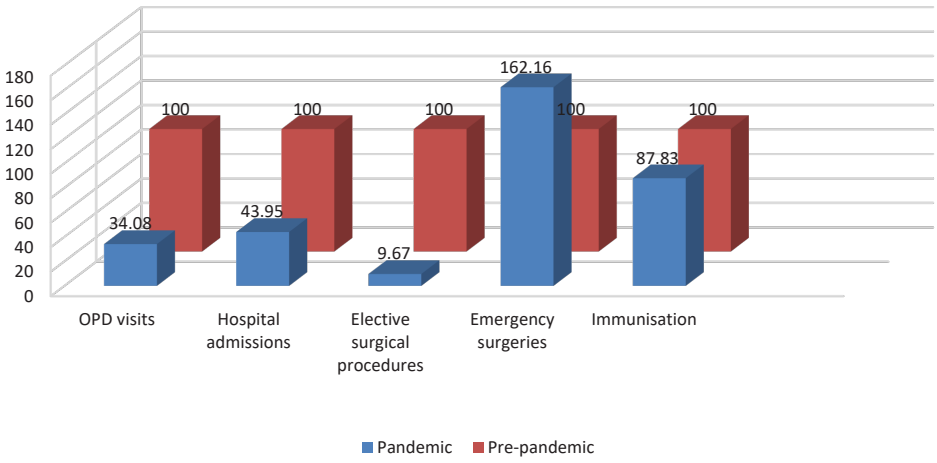

Figure 1. Percentage Reduction in Various Study Parameters .

Table 2. Demographic Information of Study Population

	Time Period	No. (%)	No. (%)	Mean (SD)
Outpatient visits	Pre-pandemic	15237 (53.67)	13513 (46.33)	34.6 ± 8.3 years
	Pandemic	6870 (70.13)	2927 (29.87)	54.7 ± 6.2 years
Hospital admissions	Pre-pandemic	778 (52.65)	701 (47.35)	37.5 ± 7.6 years
	Pandemic	399 (61.43)	251 (38.57)	46.5 ± 6.3 years
Elective surgeries	Pre-pandemic	278 (46.43)	322 (53.57)	46.4 ± 9.3 years
	Pandemic	20 (34.64)	38 (65.36)	33.7 ± 19.3 years

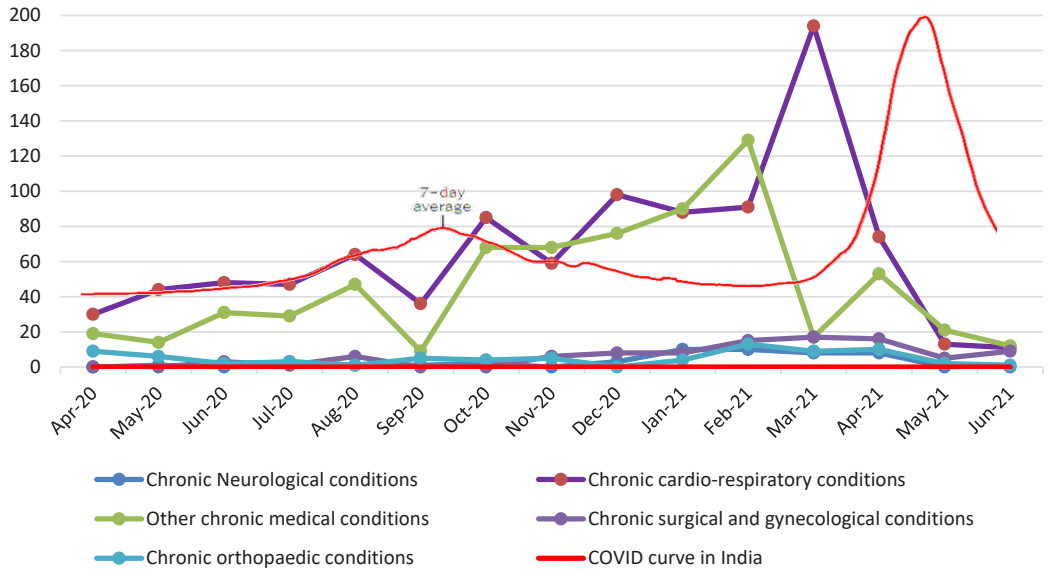

Figure 2. Presentation of chronic non-COVID patients during the study period. The red line shows COVID-19 cases in India.[28]

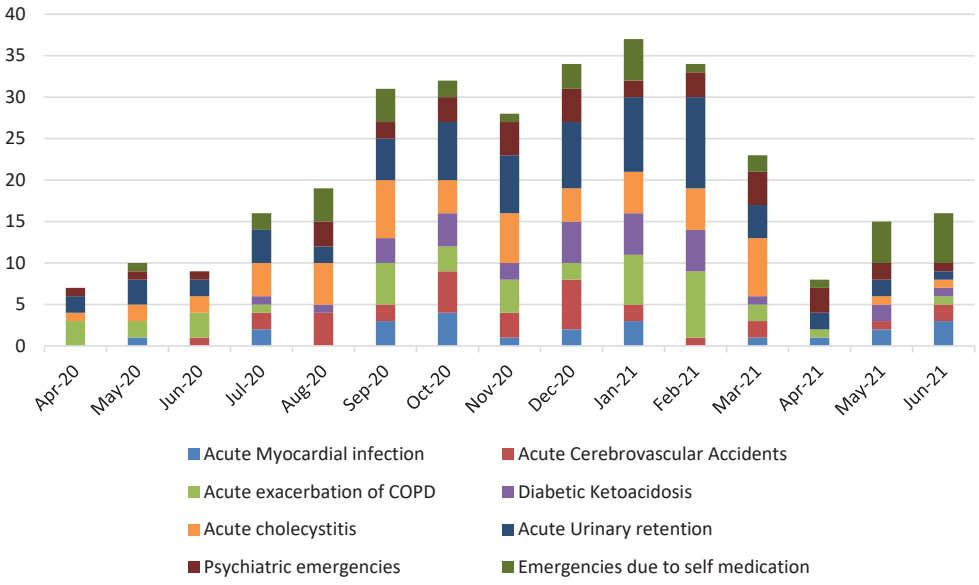

Figure 3. Chronic Non-COVID-19 Patients Presenting With Emergencies During the Pandemic .

non-COVID-19 patients was more pronounced (65.92%) possibly due to Hilly Terrain, lack of transport options during the lockdown, and the inclement weather.

The authors noted a drastic reduction (90.33%) in the elective surgical procedures. This decrease was in line with the results of Castoldi et al, who reported a 60% reduction in the number of emergency surgeries due to the pandemic in a region of Italy.[15] There was also a disproportionate impact on ophthalmological procedures in Italy falling by 76.7%.[16] A similar reduction in otorhinolaryngological surgeries has been reported.[17] The authors observed a similar disproportionate impact on surgeries in these two subjects in our department (94.66% fall in ophthalmological surgeries and 90.47% fall in otorhinolaryngological surgeries).

The fall in immunization coverage under UIP observed by us has also been reported by McDonald et al.[18] This reflects the effect of the pandemic on preventive health services.

The patients faced a lot of hardships in reaching the hospital due to frequent lockdowns leading to limited transport options. They were also apprehensive about the risk of contracting COVID-19 infection in the hospital and avoided hospital visits except during emergencies. Similar transport issues have also been described by other authors.[19]

Various departments of the hospital faced numerous challenges to provide adequate care to non-COVID-19 patients. Surgeons faced continuous adjournment of elective surgeries due to the employment of anesthesia

and surgical staff in COVID-19 duties. The oxygen supply was also diverted for the management of COVID-19 patients. This led to non-COVID-19 patients presenting with complications of their chronic non-COVID-19 pathologies, thus requiring emergency surgeries. Even between the peaks of the pandemic, the non-COVID-19 patients faced a long waiting list for surgeries. Given the lack of access to the hospital due to factors discussed earlier; patients suffering from musculoskeletal disorders, geriatric patients, and pediatric patients with cerebral palsy could not access physiotherapy services. Similar issues have been experienced by advanced healthcare systems of the western world.[20,21]

The pandemic adversely impacted the patients with malignancy. They presented at the advanced stage of their disease. This prevented the application of early and curative treatment options. A lot of patients also ignored the reduced flag signs of malignancy resulting in the delay in diagnosis. The screening services for breast and cervical cancer also took a backseat leading to missed detection of pre-malignant lesions.

All patients with respiratory symptoms had to undergo COVID-19 testing as per WHO directions. This led to an adverse impact on the management of non-COVID-19 respiratory conditions such as acute exacerbations of bronchial asthma and chronic obstructive pulmonary disease as these patients were initially presumed to have COVID-19 infection. These patients also presented late to the hospital due to apprehension about being quarantined or admitted to the COVID-19 ward. Patients with chronic conditions such as hypertension, diabetes Mellitus, thyroid disorders, cardiovascular disorders, old stroke, hepatic and renal failure require constant care and supervision by trained medical professionals. This became difficult due to the pandemic resulting in a vicious cycle of clinical worsening followed by a lack of proper care and subsequent presentation to the emergency department in a worse condition. There was a marked increase in self-medication and many patients resorted to alternative forms of medicine leading to associated adverse effects. These patients presented with conditions like perforated gastric/duodenal ulcer, renal failure, and drug overdoses. In their review, Rehman and Ahmad have discussed this subject extensively.[22]

Antenatal care was adversely affected due to lack of regular visits, lack of adequate nutritional supplementation, and inability to swiftly obtain transport even in an event like labor. These patients were also apprehensive about the possible effects of contracting COVID-19 on their fetuses. The postnatal and pediatric care was hampered due to reduced anesthesia staff, reduced opportunities for immunization, and fear of contracting COVID-19 infection. These issues have also been felt by the tertiary care hospitals in our country.[23] Geriatric patients and persons with disabilities were disproportionately affected by the pandemic due to isolation, lack of mobility, and the inability of family or caregivers to visit them.

The pandemic and the frequent lockdowns had a severe effect on mental health by affecting livelihood, interpersonal relations, sleep, nutrition, and physical activity. Prolonged indoor confinement led to a lack of balanced diet and exercise leading to the worsening of chronic diseases, development of obesity, low morale, and low self-esteem. These factors led to the development or aggravation of lifestyle illnesses. Lack of socialization for unusually long periods and reduced access to psychiatric health services had a perilous effect on mental illness cases. The authors experienced a steep rise in the stress-related issues in our telemedicine services, particularly during the second wave of the pandemic. This was likely due to increased morbidity and mortality during the second wave giving rise to fear and apprehension. These issues have been extensively discussed in the literature.[24-27]

These problems were further complicated by the environmental challenges posed by our location. The hospital faced inclement weather conditions such as frequent snowfalls, hailstorms, and landslides during the pandemic. These periods of incessant rains were associated with frequent power outages and this led to challenges in creating and maintaining the additional infrastructure on the hospital premises. The difficulties of access to the hospital were further compounded due to the frequent road closures and non-availability of public transport during these adverse weather events.

The authors discussed the solutions adopted by their hospital to tackle these issues and their experience with them in the algorithm in Figure 4. The hospital invoked multiple solutions to tackle the problems of non-COVID-19 patients. This included the Program for Patient Outreach, where the hospital initiated fortnightly medical camps in residential areas. This helped us with reaching out to the patients who could not visit the hospital due to lack of transportation and apprehension of contracting COVID-19 infection. This was further augmented by Doorstep Delivery of Medicines. The hospital also promoted a 'Hands below shoulders' policy to reinforce the COVID-19 appropriate measures in the hospital staff and the patients visiting the hospital. The hospital implemented an 'odd-even' system for OPDs to avoid overcrowding in the hospital complex. The patients were also given appointments online to stagger their hospital visits.

The authors felt that the psychological impact of the pandemic was being underestimated and hence took multiple steps to improve mental health during these testing times. The authors adopted the concept of 'counseling in continuum'[27] to provide mental health support to hospital staff as well as the patients. This was made possible by training health care workers in psychological counseling, taking help from community religious teachers, and utilizing the network of existing women's support groups. The hospital also started an online module for our clientele called 'Fight fear with Facts' to provide authentic evidence-based information to patients on topics such as COVID-19 infection and COVID-19 vaccination.

Figure 4. Challenges Faced by Non-COVID Patients and Novel Measures to Tackle Them .

Research Highlights

What Is Already Known?

- The COVID-19 pandemic resulted in a diversion of all the resources, attention, and energy of the medical personnel and administration towards the management of COVID-19 patients.
- This resulted in unforeseen difficulties and hazards for non-COVID-19 patients in accessing healthcare professionals and facilities.

What Does This Study Add?

- There are few original studies conducted in peripheral hospitals or Hilly Terrain on the plight of non-COVID-19 patients. This study bridges this gap in knowledge.
- The authors propose solutions to the problems of non-COVID-19 patients and narrate their experience with these measures in this setting. These measures can be adopted by other similar institutes in the future to handle any subsequent waves of the pandemic.

6. Conclusion

The authors acknowledge that their study was conducted at a single center with a relatively small study population. The authors also could not objectively analyze the impact of the pandemic on mental health due to the non-availability of a psychiatrist at our hospital. However, the authors have analyzed and discussed the effect of the pandemic on the inadvertently neglected non-COVID-19 patients while also taking into account the issues faced by a smaller hospital in a remote, hilly area. The authors have also discussed various novel solutions adopted by our hospital and propose the same for other hospitals to prepare for future waves of this pandemic. Continuous innovations are required to combat this ever-mutating virus and make our existing health care systems compatible with this 'new normal'.

COVID-19 pandemic has immensely challenged the traditional health care systems and has forced us to adapt ourselves to this new normal. However, more resources need to be geared towards solving the issues concerning non-COVID-19 patients and their caregivers. It is vital to simultaneously focus on both COVID-19 patients and non-COVID-19 patients to have a holistically healthy society.

Authors' Contributions

SM conceptualized the design of this study. SKK and SS contributed to the acquisition and analysis of data. SVGV and HCB contributed to the drafting and revision of the article. All authors have agreed to be personally accountable for their own contributions. They have ensured that questions related to the accuracy or integrity of any part of this work, even ones in which they were not personally involved, were appropriately investigated, resolved, and the resolution was documented in the literature; meanwhile, all authors have read and approved the manuscript.

Conflict of Interest Disclosures

The authors declare that they have no conflict of interest.

Ethical Approval

The present study was approved by the ethical board of the hospital in which the study was performed. This study was conducted in a medical educational center, in which all patients are informed that they may be subjects of scientific experiments and are informed of the ethical codes of conduct. This study complied with the latest version of the Helsinki Declaration. The ethical approval code for the present study was 04/2021.

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