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Covid-19 infection and postoperative follow-up of gynecological surgeries during the pandemic

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ABSTRACT

Introduction: The COVID-19 pandemic represented a major societal change with significant repercussions. The reduction in the number of active health professionals due to sick leave caused by viral contaminations made many hospitals restructure their services to prevent the intra-hospital spread of COVID-19, in addition to helping them deal with the new context. **Objective:** To determine the prevalence of COVID-19 infection in patients who underwent gynecological surgical procedures in a tertiary hospital during the pandemic. **Method:** This is a retrospective, descriptive, analytical, single-center study. It was carried out based on the analysis of medical records and the application of a questionnaire to patients who underwent gynecological surgical procedures at two different times during the pandemic. The first was from March 15, 2020, to July 30, 2020, and the second was from January 1st to February 28, 2021, when there was already mass vaccination for the Brazilian population and there was greater knowledge about the novel coronavirus. **Results:** There was no significant difference in the prevalence of infection by the novel coronavirus between the periods evaluated, with 3% in 2020 and 7% in 2022 (n=41 and n=76 in the first and second moments, respectively). No cases of hospital readmission were recorded. **Conclusion:** The performance of gynecological surgeries during the pandemic period in the population studied had no impact on the increased rates of respiratory infection by COVID-19, which could happen considering the patient's vulnerability in a hospital environment.

Keywords: Coronavirus; Gynecologic Surgical Procedures; Obstetrics and Gynecology Department, Hospital; Robotic Surgical Procedures.

INTRODUCTION

AThe COVID-19 pandemic, which began in China in the city of Wuhan in 2019, represented a major change in society, with significant repercussions worldwide, especially in health care1. This happened because the consequences of this disease go beyond compromising human health and also impact the logistics of hospital services and systems1. The reduction in the number of health professionals working due to sick leave caused by viral contamination, even if temporary, was one of the reasons that made many hospitals restructure their services, with rescheduling or canceling surgeries during this period in an attempt to prevent the spread of COVID-19, in addition to helping them deal with the new context[2].

COVID-19 infection can be asymptomatic or can have a wide spectrum of symptoms, ranging from mild manifestation of upper airway involvement to death3. Thus, precaution is necessary for patients who need to undergo surgical procedures so that there is no infection by COVID-19. This is because this virus compromises the immune system, increasing the risks of complications in the pre and postoperative period 4. In addition, it is worth noting that all surgical procedures can have an immediate impact on immune function and induce an early systemic inflammatory response, aggravating the patient's clinical condition5.

Compliance with health protocols established by the institution and the municipality led to a decrease in the number of surgeries performed6. During the period studied, there was a lack of conclusive and quality studies that evidence the post-surgical prognosis within the context of the pandemic, and further study on the topic is needed. This is justified so that there is a theoretical-scientific basis regarding the relationship between invasive procedures and COVID-19 infection, combined with the analysis of the impact of surgeries on the patient's clinical condition5.

In summary, the primary objective of this study is to determine the prevalence of COVID-19 cases in patients who underwent elective gynecological procedures in a tertiary hospital. The secondary objectives are to analyze the clinical prognosis of patients operated on during the pandemic, correlate them with the context of the period, and evaluate the potential impact of performing gynecological surgical procedures on the risk of infection by COVID-19 so that it is possible to measure the benefit for the patient in performing elective surgeries in contexts of infectious vulnerability, such as the pandemic, considering the rates of respiratory infection after attending the hospital environment. This analysis becomes important when considering the context of hospital vulnerability, combined with the performance of a surgical procedure in a pandemic period, which may be of great use later to improve infectious safety standards in the hospital environment in any situation.

METHODS

Study design and sample

This is a retrospective, descriptive, analytical, and single-center study evaluating patients admitted for gynecological surgeries in a private hospital in the city of Belo Horizonte. It was carried out in two different epidemiological periods of the COVID-19 pandemic. The first was from March 15, 2020, the initial period of the spread of the pandemic in our country, until July 30, 2020 (n=41). The second was during January and February 2022, when there was already mass vaccination for the Brazilian population, and there was greater knowledge about the new coronavirus (n=76)7.

The inclusion criteria were patients over 18 years of age who underwent a gynecological surgical procedure at the hospital where the research was carried out within the period established by the study and who agreed to the Informed Consent Forms (ICF). The exclusion criteria were pregnant patients and patients who manifested symptoms of COVID-19 within more than 60 days after the gynecological procedure performed at the hospital.

Instruments and procedures

The study was carried out with the analysis of data obtained from the institution's electronic medical records. The patient's clinical condition at admission for the surgical procedure and the entire perioperative period were analyzed retrospectively with the reading of medical records so that it was possible to select the patient who would be able to apply a single question-

naire later. This questionnaire was applied by the authors during an interview with the selected patients who agreed to participate in the research.

The contact with the patients was an objective interview that first included an invitation to participate in the study and, based on the patient's acceptance, direct questions about the research that were contained in the questionnaire previously assembled. The patients were informed that the information obtained would be used strictly for analysis and the study involved in this project. In addition, only the researchers had access to the participant's identification and the answers to the questionnaires.

The variables considered in the study were age, weight, height, body mass index (BMI), intraoperative and postoperative complications, readmissions, diagnostic tests for COVID-19, evolution, and postoperative clinical outcome (flu-like symptoms, for example). After data collection, the patients were divided into groups, with the criteria being the presence or absence of rehospitalization and COVID-19 infection/disease. Patients were considered infected after a positive rapid test or PCR test for COVID-198.

For all women who underwent gynecological surgery during the period proposed for the study, there was a subsequent contact to request the completion of a targeted questionnaire that addressed the assessment of COVID-19 symptoms, identification of tests performed to diagnose the infection, and what conducts were taken to relieve COVID-19 symptoms.

There was no differentiation between the modalities of gynecological surgeries performed for the analysis of respiratory infection by COVID-19, only their surgical routes.

Statistical analysis

For the statistical analysis, Fisher's exact test was chosen to analyze the association between two categorical variables in which the samples were small, and there were cells with low expected counts, while the Wilcoxon test was chosen to analyze the difference between two related samples in which the samples did not follow a normal distribution. Each test was chosen based on the characteristics of the samples and the specific hypotheses to be tested.

Ethical considerations

All ethical principles were observed and followed Resolution 466/12 of the National Health Council (CAAE 60180322.0.0000.5125). In addition, all personal information obtained for the study was collected after the patient's consent.

RESULTS

We included 117 patients admitted to a tertiary hospital who met the inclusion criteria of the research in the pre-established period, obtaining the appropriate sample for analysis in view of the limitations imposed by the COVID-19 pandemic.

Of the patients interviewed (Table 1), 33% were single, while 61% were married. For the registered education, 33% had completed higher education, and 33% had an uninformed level of education. Based on statistical parameters, the profile of the volunteers is characterized by (a) a median age of 42 years, ranging from 36 to 52 years; (b) a median weight of 67kg, ranging from 60kg to 77kg; (c) a median BMI of 25.5kg/m², ranging from 22.4kg/m² to 29.3kg/m².

Table 1 - Description of the characteristics of patients undergoing gynecological surgeries in a private hospital in the city of Belo Horizonte (n=117)

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Characteristics	**n** (%)
Marital status	
Single	38 (33)
Married woman	71 (61)
Stable Union	2 (1,3)
Divorcee	4 (3.5)
Widow	2 (1.2)
Schooling	
Complete elementary school	14 (12)
Complete high school	23 (20)
Complete higher education	39 (33)
Complete postgraduate	2 (2)
Other	39 (33)
Age	42 (36, 52)
Weight	67 (60, 77)
Body mass index	25,5 (22,4, 29,3)

The studies were carried out in two distinct epidemiological periods of the COVID-19 pandemic. The first was from March 15, 2020, the initial period of the spread of the pandemic in our country, until July 30, 2020 (n=41). The second was during January and February 2022, when there was already mass vaccination for the Brazilian population, and there was greater knowledge about the new coronavirus (n=76)7.

The study identified the prevalence of COVID-19 infection in the group of patients studied and the existence or absence of clinical and surgical complications involved in this context. Based on this, it was observed that the rate of COVID-19 infection related to elective gynecological surgeries during the pandemic period was 4.3% (Table 4). Among the infected patients, none required readmission to hospital or other health care services due to the complications caused by COVID-19.

Table 2 - Quantitative analysis of the variables

Characteristics	Total, N = 117	Presence of COVID-19, N = 5	P[2] value
Data			**0,3**
2020	76 (100%)	2 (32%)	
2022	41 (100%)	3 (7%)	
Length of hospital stay	21 (8,27)	9 (8,9)	**0,3**

[1]n (%); Median (Amplitude Interquartile)

Regarding the length of hospital stay (Table 2), there were differences between patients with and without COVID-19 since the median was 9 days (ranging from 3 to 14 days) and 22 days (ranging from 14 to 35 days), respectively. Among the patients with COVID-19 (n=5), only one patient reported the presence of comorbidity.

Based on data collection, the characterization of the surgical route represents another important aspect, as shown in Table 3:

Table 3 - Prevalence of a specific surgical route

Characteristics	Total, N = 117	Presence of COVID-19, N = 5
No perioperative complications	117 (100%)	5 (100%)
Laparotomy	11 (9%)	1 (20%)
Laparoscopy	38 (32%)	0 (0%)
Robotic laparoscopy	1 (0%)	0 (0%)
Vaginal	21 (18%)	0 (0%)
Hysteroscopy	43 (37%)	4 (80%)
Mixed	2 (2%)	0 (0%)

Absolute values and percentages of the crossings of some variables used in the study.

Thus, it is observed that the percentages of surgical routes used for patients who had COVID-19 and those who did not (Table 4) are, respectively: 9% and 91% for laparotomy, 0% and 100% for laparoscopy, 0% and 100% for laparoscopy with robotics; and 0% and 100% with vaginal method. Table 4 also presents the cases for hysteroscopy and mixed with their respective associated percentages. During the study period, none of the patients who underwent elective gynecological surgeries had complications.

In addition, it is possible to expose the prevalence of symptoms in patients positive for COVID-19 from the following table:

Table 4 - Prevalence of symptoms in patients with COVID-19.

COVID-19 patients	Presence or absence of symptoms, N=5[1]
Characteristics	**Total**, N = 73[1]
Ageusia	4 (80%)
Anosmia	4 (80%)
Headache	2 (40%)
Diarrhea	0 (0%)
Dyspnea	2 (40%)
Abdominal pain	1 (20%)
Fatigue	2 (40%)
Fever	4 (80%)
Myalgia and/or arthralgia	4 (80%)
Nausea	1 (20%)
Odynophagia	3 (60%)
Dry cough	5 (100%)
Productive cough	1 (20%)
Other	3 (60%)
Did you require readmission due to COVID-19 symptoms?	5 (100%)

Valores absolutos e percentuais dos cruzamentos de algumas variáveis utilizadas no estudo.

Among the patients who underwent gynecological surgeries and contracted the new coronavirus, the most prevalent symptoms (Table 4) and their respective percentages were: dry cough (100%), ageusia, anosmia, fever, and myalgia and/or arthralgia (80%); odynophagia (60%); headache, dyspnea, and fatigue (40%); abdominal pain, nausea, and productive cough (20%).

DISCUSSION

The initial number of patients recruited for the study was 330, but there was a loss of volunteers due to the difficulty in maintaining contact during the study phases since this is a retrospective study. Thus, only 117 women were considered for the project since the loss of contact with the patients previously reported was due to the change in personal telephone contact or only the absence of response to the call. Based on this assumption, there was a difference in the number of patients between the patient samples studied in the two periods, with a greater number of women in 2020, which can be justified by the fact that in this period, there is social distancing and, as a result, they were able to direct more attention to their gynecological complaints, seek help to resolve the complaint and, consequently, be more available for the current study9.

The results of the survey pointed to an increase in the rate of COVID-19 infection in patients undergoing gynecological surgeries from 2020 (3%) to 2022 (7%). This may be related to the increase in the overall rate of COVID-19 infection and the reduction in the safety measures used during the procedures. According

to the Epidemiological Bulletin of the City of Belo Horizonte, the numbers of confirmed cases of COVID-19 in April 2020 and January 2022 were, respectively, 398 cases and 306,248 cases, corroborating the data presented in the study. When undergoing statistical analysis, the data presented in the research indicated the variable ''p" with a value of 0.3 for the two characteristics mentioned above, framing them as negligible for the study.

In addition, the average length of hospital stay of patients with COVID-19 was considerably shorter when compared to patients who did not have COVID-19. The median length of hospital stay for patients with and without COVID-19 was 9 days and 22 days, respectively. This data suggests that the time the patient stays in the hospital is not directly related to the risk of infection by COVID-19 since the safety measures adopted by the hospital at the time of the pandemic were effective. Among them, the conduct and care protocols with isolation of specific areas and processes for patients suspected of being infected by COVID-19 stand out. The surgical teams, after an initial period in the pandemic of complete restriction of approximately three weeks of surgical procedures, except for urgencies and emergencies associated with high-risk potential in the postponement of their execution, began a careful individualization to perform elective cases10,13.

In addition, it was noticeable that the disease profile of patients who contracted COVID-19 was characterized by mild conditions characterized by the absence of the need for hospital readmission, which was confirmed by the data presented by the participants. In this sense, the hospital environment can be framed as a safe place with a low rate of contamination by COVID-1910.

Within this context, the fumes released during surgical procedures, especially laparoscopic procedures, with or without the assistance of robotics, was a reason for great speculation, and its choice was the reason for recommendations published at the beginning of the pandemic to minimize the risks of contamination for patients and teams.12 However, based on the data presented in this study, it was observed that patients who underwent laparoscopy and laparoscopy with robotics did not contract COVID-19 in any of the periods analyzed, going against the hypotheses established at the beginning of the pandemic11. In addition, hysteroscopy in clinical practice is a surgical route characterized by a short hospital stay, and according to the results illustrated in the "Surgical Routes" table, 80% of the patients (4 patients) who underwent hysteroscopy contracted COVID-19, demonstrating once again the non-direct relationship between length of hospital stay and coronavirus infection.

All procedures performed in the health unit strictly followed the clinical and surgical indications defined by the attending physician of the patients involved in the research and by the hospital, without any interference or procedure directly indicated by the study design.

This study is characterized as of great scientific importance when considering the analyses performed. Based on the rates of respiratory infections by COVID-19 during the pandemic in patients undergoing gynecological surgical procedures, further analyses on the quality of hospital prevention of the transmission of respiratory infections can be made. From this, future intra-hospital improvements can be applied continuously in medical practice.

CONCLUSION

The project contributed to science and society as it directed the understanding and comprehension of the COVID-19 pandemic, which was characterized by many uncertainties. The study can be a tool to help define the

risk-benefit equation related to elective gynecological surgical procedures during the pandemic period, contributing to decision-making regarding the indication and contraindication of various essential surgical procedures in daily life, the treatment of various pathologies that affect women in the various stages of their lives, and the adequate definition of the best moment in women's health14.

In short, subsequent studies will be necessary for a better analysis of the prognosis of surgeries performed during the pandemic period when considering the limitations involved in this research. However, it is possible to conclude that in the Hospital studied, the performance of surgeries during the pandemic period did not have a negative impact on the performance of elective gynecological surgeries and the rates of respiratory infection caused by COVID-19 during the pandemic. Through this study, it was not possible to identify a direct relationship with the severe form of the disease, characterizing it as one requiring hospitalization, which was confirmed by the absence of readmission to the service due to COVID-19 symptoms.

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THE AUTHORS DECLARE THAT THERE IS NO CONFLICT OF INTERESTS IN RELATION TO THIS ARTICLE.