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Gynecologic surgery during the COVID-19 pandemic: Patan Hospital experience

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Abstract

Introduction: The COVID-19 pandemic is a major challenge for health care services including safe and effective surgery. This study aims to analyze gynecological surgery delivery during the COVID-19 pandemic.

Method: Data on gynecologic surgeries performed at Patan Hospital from 01 Jan to 31 Dec 2020 during pre-lockdown, lockdown, and post-lockdown period of the COVID-19 pandemic were analyzed from the medical record for surgical procedures, blood transfusion, ICU stay, length of hospital stay, mortality, COVID-19 PCR positive cases. Chi-square and ANOVA tests were used to compare between three periods, p-value <0.05 was considered statistically significant. Ethical approval was obtained.

Result: Out of 413 surgeries, 159(36.1%) were done during pre-lockdown, 116 (28.1%) during a lockdown, and 148 (35.8%) during the post-lockdown period. Major surgery was 155(37.5%), minor 249(60.3%), minimally invasive 9(2.2%) and 61(14.8%) required blood transfusion. Mean hospital stay was 3.75±3.711 d, 15(3.63%) stayed in ICU following procedure and 1(0.2%) expired. Thirteen patients were suspected with COVID-19 infection 8 were PCR positive.

Conclusion: There was a decrease in major procedures during the lockdown period.

Keyword: COVID-19 pandemic, gynecological surgery, lockdown, pre-lockdown, post-lockdown

Introduction

The COVID-19 epidemic which was identified in December 2019, was declared a public health emergency by WHO on January 30, 2020,¹ and pandemic on March 2020.² In Nepal, a country-wide lockdown was issued on 24 March 2020 till 21 July 2020.³ Infection with SARS-COV-2, has been associated with considerable postoperative mortality and morbidity for surgical patients.⁴ So, it required significant changes in gynecologic health care delivery to minimize the risk of transmission during the pandemic.⁵ Since then, safety protocols have been adopted for patients and health professionals to enable the continued execution of both elective and necessary surgical procedures and minimize the risk of transmission during the pandemic.⁶

People may have avoided seeking out available health care services because of fears.⁷ Patan hospital has been one of the referral centers for COVID-19 patients. The hospital developed a triage system based on COVID-19 risk to prevent a widespread outbreak of the disease. A considerable number of gynecologic surgeries were performed minimizing the risk of nosocomial spread of COVID-19 against continuing care for acute gynecological surgical conditions and managing urgent elective surgery during the pandemic.

This study aims to present gynecologic surgery performed during the pre-lockdown, lockdown, and post-lockdown period of the covid-19 pandemic, perioperative complications, number of cases with suspected and positive COVID-19 infection.

Method

This is a retrospective analysis of patients who underwent gynecologic surgeries at Patan hospital, Patan Academy of health sciences, Nepal from 01 Jan to 31 Dec 2020 during the COVID-19 pandemic. The Government of Nepal issued a nationwide lockdown from 24 Mar to 21 Jul 2020. On 05 Aug, the Nepal government enforced a partial lockdown in

various parts of the country. Lockdown was reimposed in Kathmandu valley, Lalitpur, and Bhaktapur on 20 Aug extended until 09 Sept.⁸ The decision was made in light of a rising number of COVID-19 cases in the country. Nepal's land borders remain closed to foreign nationals until at least September 16.⁸ Different phases of lockdown and restrictions were planned to contain virus circulation and prevent complete socioeconomic collapse.

Data of the patients collected from the medical record section have been divided into three groups: Pre-lockdown (01 Jan - 23 Mar 2020), Lockdown (24 Mar - 21 Jul), and Post-lockdown period (22 Jul - 31 Dec 2020). Ethical approval for the study was obtained from the Institutional Review Committee of PAHS.

High-risk patients suspected of COVID-19 as defined by the national testing guidelines were admitted through fever clinics for further treatment.⁹ During the phase of pre-lockdown, the PCR test for detection of SARS-COV-2 was conducted for suspected cases or close contact with a confirmed case. In the lockdown period, the PCR test was performed in all cases coming from high-risk areas distributed by the government of Nepal. In the post-lockdown phase, starting from 15 Sept 2020 antigen test was done to all admitting cases, confirmed with PCR test.

Data of the patients were collected in terms of types of surgery (major, minor, and minimally invasive), perioperative outcome (mortality, length of hospital stay, blood transfusion, ICU stay), PCR for COVID-19 for the suspected group. Major surgery is any invasive operative procedure in which a more extensive resection is performed with the opening of a mesenchymal barrier (pleural cavity, peritoneum, meninges). In our study, it included total abdominal hysterectomy with or without bilateral salpingo-oophorectomy, subtotal hysterectomy, Vaginal hysterectomy with pelvic floor repair, Fothergill operation, exploratory laparotomy, re-laparotomy.¹⁰ Minor surgery is any invasive operative procedure in which only skin or mucus membranes and connective tissue is resected,

biopsy for procurement of tissue is taken.¹⁰ In our study included manual vacuum aspiration, evacuation of the retained product of conception, check curettage, suction, and evacuation, endometrial biopsy with or without cervical polypectomy, cervical biopsy, vulval biopsy, perineal tear repair, Norplant removal, Cu-T removal, debridement, re-suturing, marsupialization, incision and drainage of Bartholin abscess, labial abscess, hematoma exploration, examination under anesthesia, McDonald cerclage, post-cesarean section endometriosis excision. Minimally invasive surgical approach refers to surgical techniques performed with a digital camera connected to a telescope that is inserted either into the abdomen (laparoscopy) or through the cervix into the uterine cavity (hysteroscopy),¹¹ which in our study included diagnostic hysteroscopy, hysteroscopic endometrial biopsy, hysteroscopic polypectomy, hysteroscopic Cu-T removal, laparoscopic hysterectomy.

Data were analyzed using IBM statistical package for social sciences (SPSS) software and descriptive analysis were performed for frequency and percentage, and p-value was calculated using chi-square test to compare the number of surgeries, blood transfusion between the pre lockdown, lockdown, and post lockdown periods. ANOVA test was used to identify the p-value for the length of hospital stay. The p-value <0.05 was considered statistically significant.

Result

This analysis includes 413 patients who had gynecologic surgeries between January 1 and 31 Dec 2020 of whom 155(37.5%) had major

surgery, 249(60.3%) had minor procedures and 9(2.2%) had minimally invasive surgery.

The number of surgeries done during the pre-lockdown period (1st Jan-23rd mar) was 149(36.1%), lockdown (24th mar-21st jul) was 116(28.1%) and post-lockdown (22nd Jul-31st Dec) were 148(35.8%), statistically not significant, p=0.054, Table 1. The Pearson and likelihood chi-square statistics were 9.293 and 11.345 respectively. There was a decrease in the number of major procedures and no minimally invasive surgery was done during the lockdown period.

Blood transfusion due to surgical bleeding was done in 61 (14.8%) Table 2, p-value calculated by chi-square test was 0.954 which was not significant. In the entire group, the mean hospital stay was 3.75±3.711 days, and the longest hospital admission during pre-lockdown, p 0.038 calculated by ANOVA was statistically significant Table 3.

Postoperatively 2(0.5%) cases required ICU care during pre-lockdown phase, 9(2.2%) during lockdown (included PCR positive cases) and 4(1%) during post-lockdown (including PCR positive cases). The PCR-positive cases were kept in COVID-19 ICU. There was 1(0.2%) mortality during post-lockdown. It was a case of exploratory laparotomy for left endometriosis cyst rupture with COVID-19 pneumonia in septic shock.

All 13(3.15%) suspected cases for COVID-19 were operated in the COVID-19 operating room with full protective gear. Among them, 6(46.15%) presented during lockdown and 7(53.85%) during post-lockdown, Table 4.

Table 1. Gynecologic surgeries in Patan Hospital, Nepal during the COVID-19 pre-lockdown, lockdown, and post-lockdown period, N=413

	Major surgery		Minor surgery		Minimally invasive		p value
	N	%	N	%	N	%	
Pre-lockdown, 149	55	36.9	91	61.1	3	2.0	0.054
Lockdown, 116	37	31.9	79	68.1	0	0.0	
Post-lockdown, 148	63	42.6	79	53.4	6	4.1	
	155	37.5	249	60.3	9	2.2	

Table 2. Blood transfusion in gynecologic surgeries in Patan Hospital, Nepal during pre-lockdown, lockdown, and post-lockdown period

Total cases (413)	Blood transfusion		p value
	N	%	
Pre-lockdown (149)	23	15.4	0.954
Lockdown (116)	17	14.7	
Post-lockdown (148)	21	14.2	
	61	14.8	

Table 3. Length of hospital stay during COVID-19 pre-lockdown, lockdown and post-lockdown

	Mean	SD	p value
Pre-lockdown (149)	4.28	4.381	0.038
Lockdown (116)	3.78	3.728	
Post-lockdown (148)	3.18	2.792	
Total (413)	3.75	3.711	

Table 4. COVID-19 suspect and positive cases during lockdown and post-lockdown, N=13

COVID status	Lockdown, N=6		Post-lockdown, N=7	
	PCR +ve N=2	PCR -ve, N=4	PCR +ve, N=6	PCR -ve, N=1
With COVID symptoms	1	1	2	-
Without COVID symptoms	1	3	4	1

Discussion

This study elicited the majority of minor cases being performed in one year of pandemic, even during lockdown period, with thirteen suspected cases for COVID-19 out of which eight turned out to be positive. Our study reflects the number of gynecological surgeries performed with curative intent in our institution despite the constraints caused by the pandemic, without compromising on COVID-19 care. For surgical patients, a joint statement was released on March 16, 2020, stating elective procedures should be postponed to divert health care attention and resources for a public health crisis.¹² During the period of lockdown, there was a decrease in the number of surgeries to 116 (28.1%) but a considerable number of minor procedures 68.1% were done which included mostly emergency cases. In another study done during the COVID-19 pandemic in New York City, 105 surgeries were completed from March 15 to April 30, out of which 45 cases were identified as emergent and urgent gynecological surgical procedures as in Mid-March of 2020 there was a moratorium on elective services due to the COVID-19

pandemic. Pre-operative PCR testing for COVID-19 was available on March 31, but emergency cases were not delayed to await test results.¹³

In Brazil, both the National Health Agency (ANS) and National Health Surveillance Agency (ANVISA) advised the postponement of elective and non-essential surgeries, causing a considerable impact on the number of surgical procedures that decreased by 33.4% in this period.¹⁴ In the study for determination of the effect of the pandemic on elective surgical practice, they found a significant reduction in the volume of elective surgical services rendered during April to June 2020 when there were total lockdowns in Nigeria, compared to a corresponding period in the preceding year.¹⁵ The lockdowns which severely limited movement can be considered responsible for this significant reduction. This reduction in clinic visits was noticed by other investigators.¹⁶

In our study, initially, during the pre-lockdown period, PCR test was not done in any cases admitted for gynecological surgery as none of them were suspicious or in close contact with

a confirmed case. No patient came from high-risk areas allotted by the government of Nepal. In our hospital, the Hospital Incident Command System (HICS) was activated on 16 Mar 2020 with an endorsement of the COVID-19 preparedness and response plan.¹⁷ The PCR test was conducted only in cases with clinical suspicion, or close contact with the confirmed case, or coming from high-risk areas distributed by the government of Nepal. The PCR report was made available after 12-24 h. Antigen test was started from 15 Sep 2020 to all admitting cases and confirmed with PCR test. Thirteen suspected cases were operated in COVID-19 operating theatre wearing full protective gear during the lockdown and post-lockdown period out of which eight turned out to be positive. In another study, preoperative COVID-19 RTPCR testing was performed in all cases within 72 hours of the proposed surgery. A rapid antigen test was also conducted, and surgery was performed in a separate suspect operating room with all precautions. Only patients who tested negative were taken up for semi-emergency surgery.¹⁸ Other literature stated that if urgent surgery is required, preoperative COVID-19 screening should be performed, and surgery should be performed after.¹⁹

In our study, 23(5.6%), 17(4.1%), and 21(5.1%) patients received a blood transfusion during pre-lockdown, lockdown, and post-lockdown period respectively; 15(3.63%) required ICU care postoperatively. In one study from India, out of 60 patients, postoperative complications were confined to fever (n=5), blood product transfusion (n=6), and inadvertent exposure (n=1) of patients with COVID-19. No cases of respiratory distress requiring intensive care or mortality were observed.¹⁸ In another study, 15 (44.1%) patients required admission to ICU of which 7(20.5%) died.²⁰

Out of total surgeries performed, during pre-lockdown one patient had to stay for a longer duration because of superficial surgical site wound infection after exploratory laparotomy, and was discharged after wound debridement and re-suturing.

In our setting, we had no minimally invasive surgery during the lockdown period. However, in a study done in turkey during the COVID-19 pandemic, between 10 Mar to 20 May 2020, out of 200 patients, a minimally invasive surgical approach was used in 18%.²¹ Laparoscopic surgery was quickly flagged up as a potential area where the risk of transmission might be higher in patients with the COVID-19 infection.²² In our case, during the pre-lockdown phase, a minimally invasive surgical procedure was used in 2%, none during the lockdown, and was restored to 4.1% during post lockdown. The laparoscopic approach was the preferred mode of surgery in some studies.¹⁸

There was one (0.2%) mortality, a case of exploratory laparotomy for left endometriotic cyst rupture with COVID-19 pneumonia in septic shock. The risk of perioperative mortality in patients infected with COVID-19 who are already receiving ventilator support is likely to be high.²³ In China, a group of asymptomatic patients infected with SARS-COV-2 who underwent a surgical procedure had an unfavorable evolution; 100% of patients developed symptoms, 44.1% required intensive care and 20.5% died.²⁰ A retrospectively analyzed data of patients who received abdominal emergency surgery in Wuhan, China, between 15 Jan and 15 Mar 2020, including eight patients with COVID-19 and 22 uninfected patients found that for mildly infected or asymptomatic patients, postoperative recovery was not affected.²⁴ A mortality rate as high as 20% has been observed in patients with subclinical COVID-19 infection who underwent surgery, which is much higher than the adverse outcomes attributed to other perioperative complications, such as surgical site infections or venous thromboembolism.²⁰ Although no mortality or increased morbidity was encountered in the management of emergency surgeries in their study, a challenge in surgeries during COVID-19 times include operating in a PPE, and most surgeons reported a moderate degree of difficulty while operating in a PPE.²⁰ The COVID-19 status of

every patient should be evaluated by pre-operative screening on the day of surgery.²⁵ When possible, testing should also be undertaken for symptomatic and at-risk patients before surgery.²⁵ As testing becomes more rapid and readily available, universal testing for COVID-19 may be recommended.

A decrease in the number of gynecological surgery during lockdown could be due to travel restrictions and fear of transmission of COVID-19 among patients. Our findings show limited surgery can be continued with a recommendation to wear appropriate safety measures during pandemic without significant compromise of the safety of patients and healthcare workers. However, this should be evaluated on a case-by-case basis, taking into account the patient's risk factors and comorbidities, and local resources.

One of the limitations of this study is possibly that of a retrospective data analysis and a limited number of samples from one institution which may not be generalized.

Conclusion

The present study found out that there was decrease in number of gynecologic surgery during lockdown period of the COVID-19 pandemic which was restored back during post-lockdown.

Conflict of Interest

None

Funding

None

Author Contribution

Concept, design, planning: ALL (APM, PG, SL, RST); Literature review: APM, SL, RST; Data collection: ALL; Data analysis: ALL; Draft Manuscript: APM; Revision of draft: ALL; Final Manuscript: ALL; Accountability of the work: ALL.

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