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Changes in obstetric practices in the first 3 months of the COVID-19 pandemic in a private tertiary hospital: A descriptive cross-sectional study

Kristine Mae A. de Guzman[1], Agnes L. Soriano-Estrella[1,2]

Abstract:

BACKGROUND: With the increasing number of COVID positive cases still being reported in the country, coupled with the possible vulnerability of pregnant patients to the disease, aggressive measures must be taken by all institutions to ensure safety of the patients.

OBJECTIVE: This study aimed to the determine the clinical profile and pregnancy outcome of patients who were admitted at a tertiary private hospital in Metro Manila from March 16, 2020 to June 15, 2020 in relation to the protocols that were implemented in response coronavirus disease 2019 pandemic.

METHODS: The protocols and guidelines implemented by the Department of Obstetrics and Gynecology of a private tertiary hospital in Metro Manila from March 16, 2020 to June 15, 2020 were retrieved. The case record of patients who were admitted and delivered during this period were retrieved and reviewed for pertinent data, which were recorded in a patient data collection form.

RESULTS: During the 3-month study period, COVID positive pregnant patients were effectively separated from COVID negative patients from admission to discharge based on a health declaration form and universal reverse transcriptase polymerized chain reaction (RT-PCR) testing. Discharge was facilitated after 12–48 h for uncomplicated deliveries and post partum follow-up was done via telemedicine.

CONCLUSION: The separation of COVID positive from COVID negative patients based on symptoms and RT-PCR results were effective in ensuring the safety of patients.

Keywords:

COVID-19, obstetric protocol, pandemic, quarantine, SARS-CoV-2

[1]Department of Obstetrics and Gynecology, St. Luke's Medical Center-Global City, Taguig City, Philippines, [2]Department of Obstetrics and Gynecology, Philippine General Hospital, University of the Philippines, Manila, Philippines

Address for correspondence:
Kristine Mae A. de Guzman, M.D.
Department of Obstetrics and Gynecology, St. Luke's Medical Center-Global City, Taguig City, Philippines.
E-mail: tinmae123@gmail.com

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Introduction

In December 2019, a new strain of coronavirus, designated as severe acute respiratory syndrome coronavirus or SARS-CoV-2, which caused a rapidly progressive pneumonia, was first identified in Wuhan, Hubei City, China.[1-3] It subsequently spread throughout China resulting in an epidemic.[1-3] The World Health Organization (WHO) designated the disease as coronavirus disease 2019 (COVID-19), which stands for COVID-19 in February 2020.[1-3] Soon, there was widespread transmission of the virus leading to a rapid increase in the number of infected individuals in various countries around the world.[1-3] As a result, the WHO declared COVID-19 as a pandemic in March 11, 2020.[4]

Currently, the number of infected individuals being reported worldwide has continued to increase. As of June 14, 2020 confirmed cases

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worldwide have reached 7,915,926 with 433,181 deaths and 4,067,248 recoveries.[5] The United States has the most number of reported cases and deaths. In the Philippines, cases of COVID-19 have also rapidly increased, starting with a Chinese couple who arrived in the country on January 21, 2020 from Wuhan.[4] They arrived in Cebu and travelled to Tacloban, where they became symptomatic. Six days from their arrival, they were diagnosed with the disease.[4] Over the next weeks, more cases of COVID-19 were reported in various parts of the country. The initial batch of individuals who were diagnosed with the disease all had a history of travel to a country with reported cases. Soon, local transmissions were reported leading to a rapid increase in the number of infected individuals and deaths, particularly in the National Capital Region (NCR). As a result, the Philippine Government put the NCR, and soon after, the entire island of Luzon and other key cities in the country under community quarantine in order to limit the spread of the disease. Despite this, the number of diagnosed cases of COVID-19 has continued to increase. As of June 14, 2020, a total of 25,930 cases have been reported in the country. Of these, 1088 individuals have died and 5954 have recovered.[6]

In the past few months, risk factors for serious conditions associated with the disease have been identified.[7] The elderly, the young, and the immunocompromised are considered a vulnerable population.[7] While more information regarding the COVID-19 is being accumulated from patients afflicted with the disease, there is still limited data on the susceptibility of pregnant women to infection with coronavirus.[7] However, based on limited data, pregnant women may be considered at higher risk of severe illnesses or mortality compared with the general population.[7]

There is still limited data on the susceptibility of pregnant patients to contract the disease. With the increasing number of COVID positive cases still being reported in the country, coupled with the possible vulnerability of pregnant patients to the disease, all hospitals across the country instituted new protocols and guidelines in order to ensure safety of the patients.

Objectives

General objective

To the determine the clinical profile and pregnancy outcome of patients who were admitted at a tertiary private hospital in Metro Manila from March 16, 2020 to June 15, 2020 in relation to protocols and guidelines that were implemented in response COVID-19 pandemic.

Specific objectives

1. To determine the proportion of pregnant patients who tested positive for COVID-19 reverse transcriptase polymerized chain reaction (RT-PCR)
2. To determine the most common clinical signs and symptoms among admitted pregnant patients with confirmed COVID-19
3. To determine the proportion of patients admitted to the medical arts building-operating room (MAB-OR) and obstetrician-gynaecologist (OB-GYN) complex who underwent cesarean section
4. To determine the proportion of pregnant patients who were transferred to the COVID floors and regular room postpartum
5. To determine the mean length of hospital stay of admitted pregnant patients
6. To determine the prevalence of preterm births, poor APGAR score, intensive or intermediate care unit (IMCU) admission among pregnant patients with symptoms or confirmed COVID-19.

Methods

Study design

This descriptive cross-sectional study was conducted in a private tertiary hospital in Metro Manila with the approval of the institution's ethics review committee.

Study population

All pregnant patients admitted in the Department of Obstetrics and Gynecology of a private tertiary hospital in Metro Manila from March 16, 2020 to June 15, 2020 were included the study.

Methodology

A review of the protocols and guidelines implemented by the Department of Obstetrics and Gynecology in a private tertiary hospital from March 16, 2020 to June 15, 2020 were retrieved. A review of the admissions census of the said department was also done to identify pregnant patients who were admitted for labor and delivered during the study period. The case records of patients who were eligible for inclusion into the study were then retrieved from the hospital's medical records section and reviewed for pertinent data, which included the following demographic characteristics: patient's age on admission, gravidity and parity, age of gestation, work environment, COVID-19 RT-PCR result, date and age of gestation when the test was done, probable source of COVID infection, chest X-ray findings if done, pertinent history and symptoms as stated in the health declaration form [Table 1] and physical examination findings pertinent to COVID-19. The following perinatal outcomes were also obtained: manner of delivery, indications for CS, hospital unit where the patient was admitted, delivered and transferred postpartum, length of hospital stay and breastfeeding status, APGAR score, and neonatal intensive care unit (NICU) or IMCU admission. All pertinent data were recorded in a patient data collection form. Other pregnant patients admitted

Table 1: Hospital health declaration form

Screening questions	Patient's response
Health declaration	
Evaluated as probable or suspected for COVID-19?	☐Yes ☐No
If yes, when did quarantine start? _____	
Any travel history in the past 14 days?	☐Yes ☐No
If yes, when and where? _____	
Come in close contact or staying in the same close environment with someone who is a confirmed COVID-19 case?	☐Yes ☐No
Come in close contact with a Probable or Suspected person with COVID-19?	☐Yes ☐No
Experienced the following symptoms recently?	☐Yes ☐No
Fever	☐Yes ☐No
Diarrhea	☐Yes ☐No
Shortness of breath	☐Yes ☐No
Headache	☐Yes ☐No
Joint pain or muscle pain	☐Yes ☐No
Sorethroat	☐Yes ☐No
Cough	☐Yes ☐No
Colds	☐Yes ☐No
New loss of smell	☐Yes ☐No
New loss of taste	☐Yes ☐No

for reasons other than delivery were excluded in this study.

Data collection

Data were entered, tabulated and analyzed using the Microsoft Excel software version 14.4.8 (150116).

Data analysis

Continuous and normally distributed demographic variables were expressed as means and standard deviations. Categorical variables were expressed as frequencies and percentages. Both point and interval (95% confidence interval) estimates for means and proportions were reported.

Results

Hospital policies for pregnant patients

On March 15, 2020, the Department of Obstetrics and Gynecology implemented a triaging system of all pregnant patients who were for admission for labor and delivery. The steps were as follows:

1. All pregnant patients were initially screened by their attending physician via teleconsultation using the hospital's health declaration form before sending them to the hospital. Patients with a positive response to any of the criteria in the checklist were directed to the emergency room for assessment while those with negative responses were asked to proceed to the OB-GYN complex
2. Upon arrival in the hospital, patients who were directed to the emergency room by their attending physician, were re-screened by the nurse on duty by asking them to fill-up the health declaration form. COVID-19 RT-PCR testing were done and samples were sent to the Research Institute for Tropical Medicine Laboratory for processing. These patients were then transferred to the MAB-OR for labor, delivery and immediate postpartum care. Patients were categorized as follows:
   a. COVID-19 suspect: the patient presents signs and symptoms of acute respiratory infection (e.g., fever, cough, shortness of breath) and with no other etiology that fully explains the clinical presentation and with history of travel or resides in an area with local or community transmission during the 14 days prior to symptom onset or patient who had close contact with a confirmed or probable COVID-19 case in the last 14 days prior to onset of symptoms[7]
   b. COVID-19 probable: the patient has inconclusive COVID-19 test or with positive result on a pan-coronavirus assay[7]
   c. COVID-19 confirmed: the patient had laboratory confirmation of virus causing COVID-19 infection, irrespective of clinical signs and symptoms.[7]

From the MAB-OR, patients who tested positive for COVID-19 and those whose COVID-19 RT-PCR results were not yet available were transferred to designated COVID-19 floors at the main hospital building while those who had negative results were brought to regular rooms. All personnel stationed at the MAB-OR or tasked to look after COVID-19 suspects, probable and positive patients donned level 4 personal protective equipment or PPE.[Table 2].

Table 2: Levels of personal protective equipment

Setting	Type of activity	Type of PPE
Level 1	Jobs that do not require contact with people known to be or suspected to be infected Workers in this category have minimal occupational contact with the public and other coworkers	Medical/procedure mask (rare cases where close contact is necessary) Cloth face coverings are required** when working in areas where others are present and there is no potential exposure to hazardous materials (e.g., hazardous chemical use, work with biohazards). If work with hazardous materials is taking place, a medical/procedure mask and/or other appropriate PPE is worn
Level 2	Jobs that require frequent/close contact* with people who may be infected, but who are not known to be infected In areas where there is ongoing community transmission, workers in this category may have contact with the general public (e.g., schools, high- population-density work environments, some high-volume retail settings)	Medical/procedure mask Face shield or splash barrier Disposable gloves Medical/procedure mask or N95 (voluntary use) Face shield or chemical goggles (splash potential) Safety glasses with face shield Disposable gown (optional) Disposable gloves
Level 3	Jobs with a high potential for exposure to known or suspected sources of COVID-19. No aerosol generating procedures performed	Respirator (N95, PAPR, or tight-fitting cartridge-style respirator) Face shield, chemical goggles, or safety glasses Disposable gown Disposable gloves
Level 4	Jobs with a high potential for exposure to known or suspected sources of COVID-19 during specific medical, post-mortem or laboratory procedures	Respirator (N95, PAPR, or tight-fitting cartridge-style respirator) Face shield, chemical goggles, or safety glasses Disposable gown Disposable gloves

PPE: Personal protective equipment, PAPR: Powered air purifying respirator

3. Patients who were negative for all items in the checklist were admitted to the OB-GYN complex for labor and delivery. No COVID 19 RT-PCR test was done on these patients.

On April 8, 2020, the Department of Obstetrics and Gynecology implemented a mandatory chest X-ray on all pregnant patients prior to admission to the OB GYN complex or MAB-OR as part of the screening process.

By April 21, 2020, the department implemented a mandatory COVID-19 RT-PCR testing of all pregnant patients at term. Testing was preferably done at 38 weeks age of gestation for patients with planned vaginal delivery. Validity of the test was 14 days. Patients were advised to self-quarantine from time of testing until delivery. If patients did not deliver after the 14-day validity period, repeat testing was required. On the other hand, patients scheduled for an elective cesarean section were advised to have the RT-PCR test done around 5 days prior to a scheduled procedure.

Discharge of all asymptomatic, chest X-ray negative or COVID 19 RT-PCR negative patients were facilitated after 12 h of an uncomplicated vaginal delivery. Those who underwent an uncomplicated cesarean delivery were discharged after 48 h. Confirmed COVID-19 cases stayed in the hospital for 2 days to >7 days.

Clinicodemographic profile of admitted patients

A total of 358 pregnant patients who were admitted for labor and delivery at the Department of Obstetrics and Gynecology of the private tertiary hospital from March 16, 2020 to June 15, 2020 were included in the study. The patients' demographic and baseline clinical characteristics are presented in Table 3. Majority of the patients were between 30 and 39 years old (66.9%) with mean maternal age of 31.9 years. More than half of the patients had at least 2 pregnancies (75.1%) and, were between 39 and 41 weeks and 6 days age of gestation (47.5%) at the time of admission. Majority of the patients (99.7%) lived where there was known local transmission of COVID-19 and worked from home since the enhanced community quarantine was implemented by the government.

A total of 174 pregnant patients were admitted prior to the implementation of mandatory RT-PCR testing, that is, the period from March 15, 2020 to April 21, 2020. Of these, 165 had negative response to all the items in the HDF and were thus admitted at the OB-GYN complex [Figure 1]. These patients did not undergo RT PCR testing, except for one who, after being admitted at the OB-GYN complex, relayed that her husband actually had travel history and had symptoms referrable to a possible infection. She had a COVID-19 test and was positive for COVID-19. There were nine patients who were admitted at the MAB-OR and underwent the COVID-19 test, two of whom had exposure to a COVID-19 suspect individual while five had symptoms but all tested negative. Two patients who had symptoms (one had fever and cough while the other had sore throat and loss of smell) had a positive result [Table 4]. Out of the nine patients

Table 3: Clinicodemographic profile of patients included in the study

	Frequency (%)
Age on admission (years old)	
20-29	106 (29.6)
30-39	238 (66.5)
40-45	14 (3.9)
Gravidity	
</=2	269 (75.1)
>/=3	89 (24.9)
Parity	
</=2	348 (97.2)
>/=3	10 (2.8)
Age of gestation (weeks)	
<34	7 (2.0)
34-36 6/7	24 (6.7)
37-38 6/7	157 (43.9)
39-41 6/7	170 (47.5)
>/=42	7 (2.0)
COVID-19 result	
Not done	160 (44.7)
Negative	194 (54.2)
Positive	4 (1.1)
Source of infection	
(−) Local transmission	1 (0.3)
(+) Local transmission	357 (99.7)
Work environment	
Work from home	294 (82.1)
Office-based	37 (10.3)
Hospital-based	27 (7.5)
Leukocyte	
Not done	202 (56.4)
Normal	64 (17.9)
Leukopenia (<4000 u/L)	0
Leukocytosis (>10,000 u/L)	92 (25.7)
Lymphocytes	
Not done	202 (56.4)
Normal	141 (39.4)
Lymphopenia (<1000 u/L)	15 (4.2)
Platelets	
Not done	202 (56.4)
Normal	156 (43.6)
Thrombocytopenia (<100,000 u/L)	0
Symptoms	
Without symptoms	351 (98.0)
With symptoms	7 (2.0)
Chest x-ray not done	287 (80.2)
Chest x-ray done	71 (19.8)
Chest x-ray without symptoms	65 (91.5)
With opacities	0
Without opacities	65 (100)
Chest x-ray with symptoms	6 (8.5)
With opacities	2 (33.3)
Without opacities	4 (66.7)
Pertinent physical examination findings	
Clear breath sounds	357 (99.7)
Crackles	1 (0.3)

admitted at the MAB-OR, five delivered by primary cesarean section and four by vaginal delivery. Among the five patients who underwent cesarean section, four were COVID-19 suspects who underwent outright primary cesarean section. One patient was a confirmed COVID-19 case who was delivered abdominally due to deteriorating maternal status [Figure 1]. All neonates had APGAR score of more than 7.

A total of 71 pregnant patients underwent chest X-ray as a consequence of the policy implemented by the department on April 8, 2020. Of these, 65 (91.5%) were asymptomatic and all had negative X-ray findings. Six patients (8.5%) had symptoms but only two had chest X-ray results showing pulmonary opacities. One out of these two patients with pulmonary opacities also had crackles on auscultation and tested positive for the disease [Figure 2].

A total of 184 patients were admitted after the implementation of mandatory COVID-19 RT-PCR testing prior to admission in the hospital. A total of 175 patients had negative results and were likewise asymptomatic. Nine asymptomatic patients who were unable to undergo COVID-19 RT-PCR testing prior to admission, were admitted at the MAB-OR for labor and delivery. Three patients delivered by primary cesarean section, one for arrest in cervical dilatation and two for uncontrolled hypertension, three by repeat cesarean section while three by vaginal delivery [Figure 2]. Among them, six were preterm at 35 weeks and 2 days to 36 weeks and 6 days age of gestation. All had good APGAR score of more than 7. These patients had their COVID-19 RT-PCR only upon admission. Only one out of the nine patients delivered due to uncontrolled hypertension had a positive COVID-19 RT-PCR, result of which was made available only after delivery.

Overall, of the 358 patients included in the study, 194 (54.2%) underwent COVID-19 RT-PCR testing. Of these, only 4 (1.1%) tested positive, 2 of whom were asymptomatic. Seven (2.0%) symptomatic patients and two (1.0%) asymptomatic patients with exposure to COVID-19 suspect tested negative.

Among the symptomatic COVID-19 negative and confirmed COVID-19 mothers, three babies were transferred to NICU/IMCU. The rest were transferred to a room adjacent to the mother's room. None of the babies tested positive for COVID-19.

All postpartum patients with uncomplicated deliveries were discharged early following the protocol set by the department but confirmed COVID-19 cases had a mean hospital stay for 2 days to >7 days.

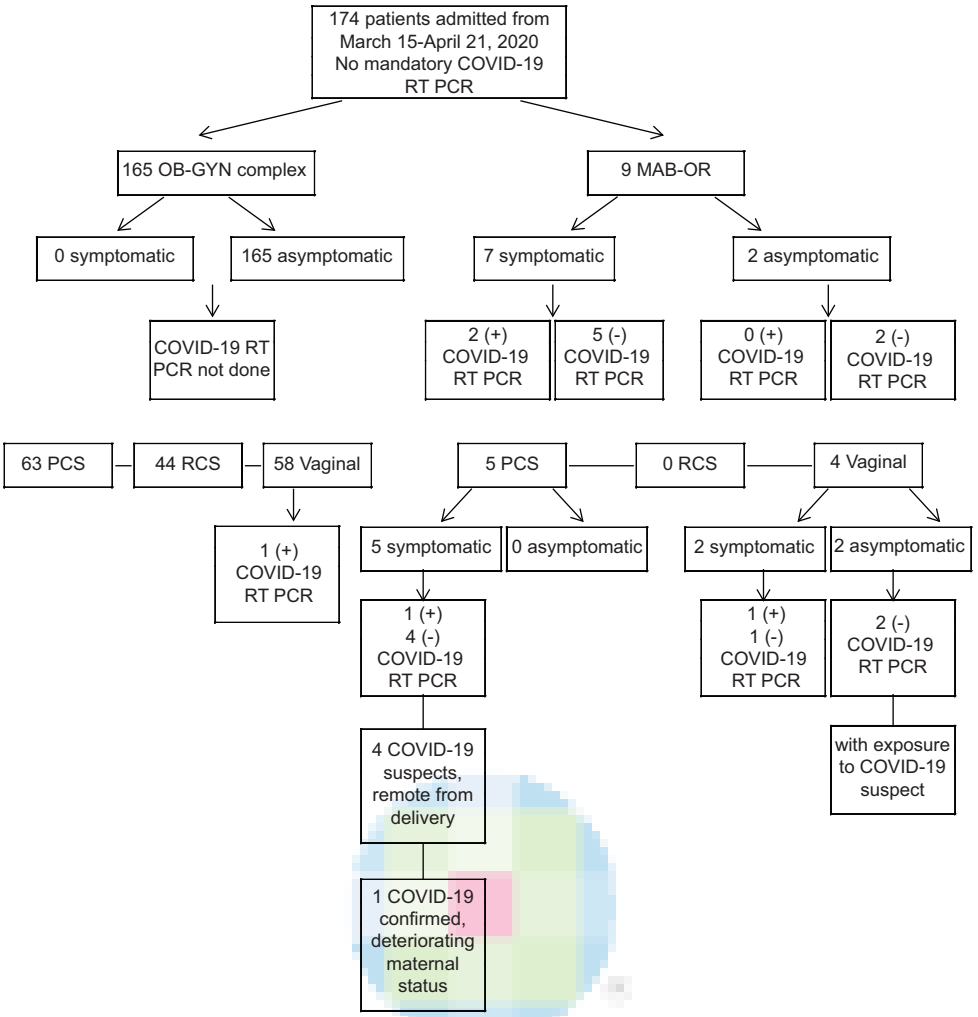

Figure 1: Patient screening using the hospital's health declaration form prior to mandatory COVID-19 RT PCR testing starting from March 15, 2020 to April 21, 2020

Discussion

During this 3-month study period, new protocols and guidelines were implemented by the department for the management of obstetric patients as a response to the COVID-19 pandemic. In order to protect the pregnant patients, a screening and triaging system were put into place. This was done to separate the pregnant patients who might be infected with the virus from those who were not.

In May 2020, Boelig *et al*. published an article on Labor and delivery guidance for COVID-19, suggesting appropriate screening. Screening for symptoms like fever and or respiratory symptoms was done. Contact or exposure to a suspected or confirmed case of COVID-19 was also part of the screening by phone calls prior to sending pregnant patients to the hospital. They also suggested a special room reserved for patients who screen positive for symptoms. Universal testing of all labor admissions was performed due to likely high rate of asymptomatic COVID-19 positive patients.[8]

Apparently, not only symptom-based screening should be done. COVID-19 RT-PCR was still important since there were symptomatic pregnant patients who had negative results and asymptomatic patients who had positive results. It is also important to get a thorough history not only of the patient but as well as the husband and other household members. Additionally, patients should be honest in answering the health declaration form. Any dishonesty may put the healthcare workers, others patients and babies at risk for exposure. We had one patient who, after being admitted at the OB-GYN complex, relayed that her husband actually had travel history and had symptoms referrable to a possible infection.

At beginning of the pandemic, COVID-19 test kits were limited and were only available for other patients who have symptoms or exposures relating to their travel history or otherwise, hence, on April 8, 2020, the Department of Obstetrics and Gynecology implemented mandatory chest X-ray as part of the screening for all pregnant patients admitted at the OB-GYN complex and MAB-OR. Based on the General Guidelines on COVID-19

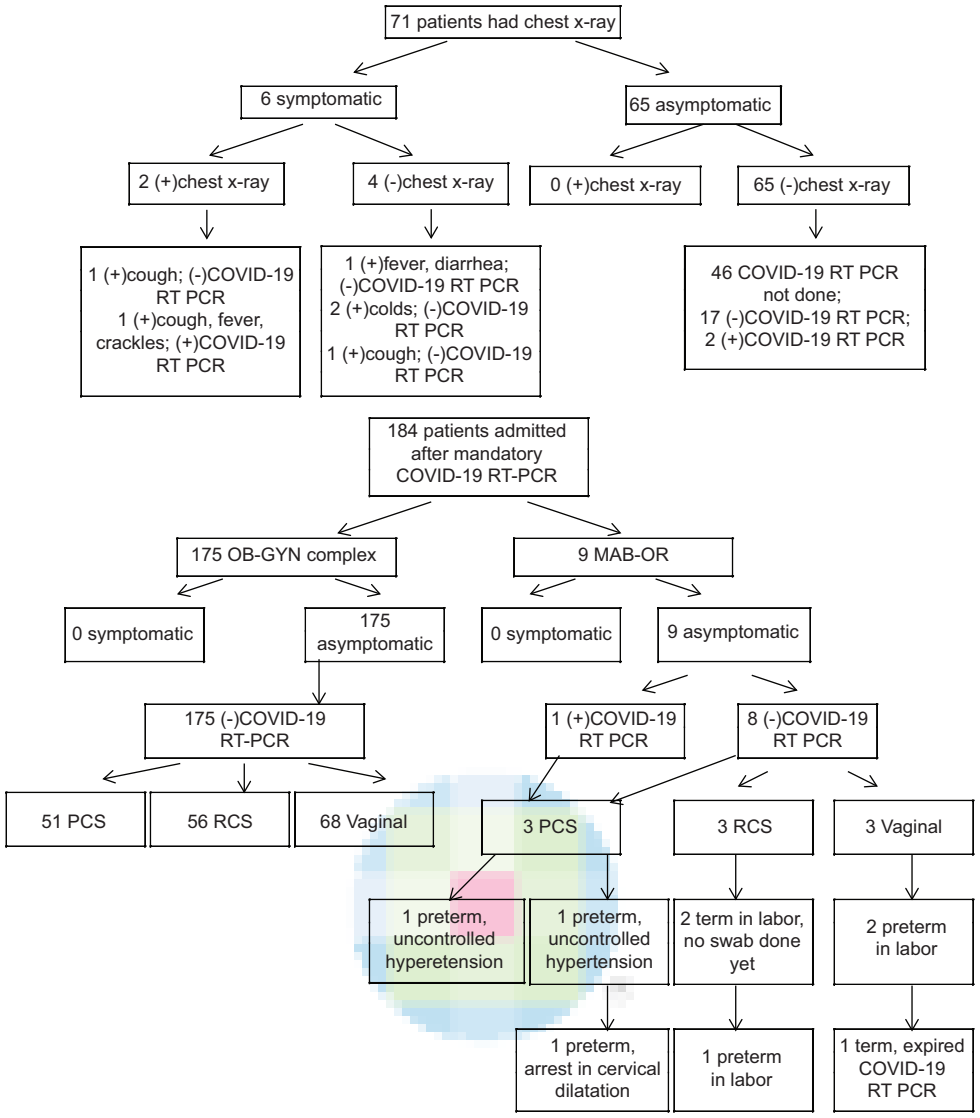

Figure 2: Mandatory chest x-ray implemention prior to mandatory COVID-19 RT PCR testing on April 8, 2020; Mandatory COVID-19 RT PCR testing implemention prior to admission starting April 21, 2020

Table 4: Most common clinical signs and symptoms referrable to a possible COVID

	COVID-19 RT PCR result, frequency (%)		
	RT PCR not done (*n*=160)	Negative (*n*=194)	Positive (*n*=4)
Fever	0	1 (0.5)	1 (25.0)
Sore throat	0	0	1 (25.0)
Cough	0	2 (1.0)	1 (25.0)
Anosmia	0	0	1 (25.0)
Diarrhea	0	1 (0.5)	0
Colds	1 (0.6)	2 (1.0)	0

RT PCR: Reverse transcriptase polymerized chain reaction

and Pregnancy released by the Philippine Obstetrical and Gynecological Society, Inc. and Philippine Society of Maternal Fetal Medicine, Inc. on March 27, 2020, there has been growing interest in the role of chest imaging as part of the diagnostic work-up where RT-PCR is not available or results are delayed. The WHO also published an article on their recommendations on the use of chest imaging including chest X-ray as a diagnostic work-up for symptomatic patients with suspected COVID-19 when RT-PCR testing is not available and RT-PCR testing is available, but results are delayed.[9]

In our study, those who had chest X-ray, none of the asymptomatic patients had an abnormal results. Only two among six symptomatic patients showed pulmonary opacities but only one tested positive for COVID-19. Therefore, screening with chest X-ray during this time was important since the number COVID-19 test kits were only limited and the results were delayed. However in an article published on "How accurate is chest imaging for diagnosing COVID-19?" in the Cochrane Collaboration in April 2021 by Islam *et al*., states that chest X-ray correctly diagnosed COVID-19 in 80.6% of people who had COVID-19. However, it incorrectly identified COVID-19 in

28.5% of people who did not have COVID-19. So chest X-ray may not be used as screening tool for COVID-19 due to its sensitivity for those who don not COVID-19 infection.[10]

In April 21, 2020, in response to the Philippine Obstetrical and Gynecological Society, Inc. and Philippine Society of Maternal Fetal Medicine, Inc. as much as the WHO recommended mandatory testing with COVID-19, the Department of Obstetrics and Gynecology implemented mandatory COVID-19 RT-PCR testing announced via Viber official group of the Department and with further instruction by the Department Chairperson. The tests were done starting at 38 weeks age of gestation for pregnant patients with planned vaginal delivery and 5 days prior for those with scheduled elective surgery. This measure was implemented due to great percentage of asymptomatic COVID-19 pregnant patients admitted for delivery. Validity of the test was 14 days. Patients were advised to self-quarantine from time of testing until delivery. If patients did not deliver by the 14-days validity period, a repeat test was performed.

This response was proven important when a retrospective study by Breslin *et al*. on COVID-19 infection among asymptomatic and symptomatic pregnant women in March 2020, showed that pregnant women with COVID-19 for delivery are often asymptomatic. A total of 14 out of 43 pregnant patients (32.6%) presented without any COVID-19 associated viral symptoms but were identified positive after they developed symptoms during admission or after the implementation of universal testing for all obstetric admissions.[11]

However, in our institution we only had one asymptomatic pregnant patient who was admitted at the OB-GYN complex whose COVID-19 test came out positive negating the study.

Initially, we had pregnant patients delivered by outright primary low transverse cesarean section, remote from delivery to lessen hospital exposure. However, it was discouraged when The Philippine Obstetrical and Gynecological Society, Inc. and Philippine Society of Maternal Fetal Medicine, Inc. released the Interim Guidelines on Labor and Delivery stating that COVID-19 alone was not an indication for cesarean delivery and that mode of delivery was dictated by obstetrical indications.[12]

Postpartum COVID-19 confirmed cases were transferred to a designated COVID floors. Those who were symptomatic were temporary transferred to these floors but after a negative COVID-19 RT-PCR result, they are brought to a regular room. Babies were also transferred to a separate but adjacent room from the mother.

To lessen further hospital exposure, discharge was facilitated after 12 h for uncomplicated vaginal deliveries. Likewise, uncomplicated cesarean deliveries were discharged after 48 h. Postpartum follow-up by the attending physician was done through patient consultation via telemedicine.

Conclusion

The changes in obstetric protocol implemented by the Department of Obstetrics and Gynecology has been beneficial to all pregnant patients admitted for labor and delivery. The symptom-based screening and the universal testing for all pregnant patients identified patients who could be infected with COVID-19. The separation of symptomatic from asymptomatic patients was effective to safeguard the safety of these patients.

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Conflicts of interest
There are no conflicts of interest.

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