Management of the first patient with confirmed COVID-19 in pregnancy in India: From guidelines to frontlines

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As the COVID-19 pandemic continues to affect millions of people across continents, it follows that pregnancy and childbirth will also be affected. Data are emerging on the consequences of the infection on mother and baby. Many guidelines on pregnancy management during the pandemic have been released, but the actual journey to establishing an obstetric unit can be challenging. The present article describes the stepwise informed approach that was taken to rapidly establish a unit for suspected COVID-19 patients within existing resources, and the experience of delivering the first pregnant patient with confirmed COVID-19 in India.

1 | DEVELOPING A FACILITY FOR SUSPECTED COVID-19 PATIENTS

- Step 1: Adopting a local standard operating procedure (SOP)

A team from the Departments of Obstetrics and Gynecology and Neonatology at the All India Institute of Medical Sciences reviewed the available literature and guidelines2-5 to develop an SOP for pregnant women with suspected/confirmed COVID-19. A pragmatic SOP was agreed and approved.

- Step 2: Setting up a triage area

A triage counter was established in a well-ventilated, spacious area close to the labor ward entrance. Personnel stationed at triage included residents and social workers who were posted in the area according to a meticulously planned duty roster. Guidelines for personal protective equipment (PPE) for triage areas were followed.7 Pregnant women meeting the criteria for COVID-19 screening were immediately directed to the screening area of the emergency department.

- Step 3: Setting up an area for patients with suspected COVID-19

It was anticipated that pregnant women who presented with symptoms of a flu-like illness would be considered suspected cases until classified as negative and would require a place for isolation. Although preparations for a designated COVID hospital were underway, an urgent need was recognized to set up a facility for labor and delivery, including cesarean delivery, of suspected cases.

The existing labor ward had no isolated space that satisfied the criteria. Furthermore, the air handling unit (AHU) was linked to the neonatal intensive care unit (NICU) area, which did not make this area feasible for use of patients with suspected infection.

As the routine outpatient services had been closed, the non-functional gynecology outpatient department presented a second option. Initially, this seemed improbable for several reasons, including lack of oxygen points, a small operating theater with lack of appropriate lighting, no provision for anesthesia, and no connection for emergency lights. However, the advantages included availability of several rooms for isolating patients, an AHU separate from the ward block, the feasibility of creating a separate entry for patients and doctors, provision of a doffing area with shower, and a separate clean exit.

With the cooperation of colleagues from neonatology, anesthesiology, hospital administration, as well as nursing colleagues, the obstacles were soon overcome. We initiated unidirectional movement of doctors from the PPE donning area to the operating theater/labor area/recovery room to the doffing and wash and shower area and,
finally, to the exit. A systematic approach included making PPE available, organizing personnel by training them in PPE use, making a rotational staff duty roster, conducting mock drills, and putting appropriate infection control practices in place. A floor-standing operating theater light was obtained from a peripheral facility. With limited engineering support available during the emergency conditions, oxygen cylinders were brought in and an anesthesia workstation was transported from another operating theater. Once the area had been established, a mock drill was carried out (Supporting Information Video S1).

### Step 4: Managing a patient with confirmed COVID-19

Within 4 days of preparing this facility, the first patient with confirmed COVID-19 presented on April 2, 2020—the first such case in India. The patient (gravida II) was at 38 + 6 weeks of pregnancy; her first delivery had been normal and the prenatal period uneventful. Although the patient was asymptomatic, she was tested because her husband was symptomatic and found to be positive for infection; her lab result was also positive for COVID-19. On examination, she was

| TABLE 1 | Summary of challenges faced in setting up an obstetric facility for COVID-19 patients. |
|---------|------------------------------------------------------------------------------------------------|
| **Challenges** | **Solutions** |
| 1. Setting up a triage area | Outside existing labor delivery as majority of patients would report there |
| Location: Emergency room or outside the existing labor delivery | Dedicated team for triage separate from on call team |
| Composition of team | Infographics were made |
| IEC materials | Appropriate PPE was arranged per guidelines for the screening area |
| PPE | |
| 2. Setting up area for suspected patients | Currently non-functional outpatient department identified |
| Identifying a suitable location | Both ward and operating theater staff were posted on request by the chief nursing officer |
| - Isolated | Separate teams posted to cover suspected area |
| - Separate entry and exit | Training roster was made in association with hospital administration |
| - Separate air conditioning | |
| Manpower for the area | |
| Nursing staff | |
| Resident teams | |
| Training in donning and doffing PPE | |
| - Residents | |
| - Faculty | |
| - Nursing staff | |
| - Cleaning staff | |
| - Technical staff | |
| Setting up operating theater | In the minor operating room in the outpatient department |
| Location | Brought in from another operating theater in the department |
| Anesthesia workstation | From a peripheral facility |
| Operating theater lights | Through cylinders |
| Oxygen supply | |
| Infection control protocols | |
| Movement of healthcare workers within the area | Entry from donning area to doffing area and exit was traced and approved by microbiologist |
| 3. During the procedure | This needs to be worked out for subsequent cases (dedicated landline/handset) |
| Communication between the surgical team and the team outside was a challenge as the entire team was in PPE | Formats need to be standardized |
| Consent formats have not been standardized | Can be defined for subsequent cases |
| Arranging blood for surgery was a challenge as the protocol was not in place (whether in the ward or operating theater) | Goggles might be a better option |
| Operating with PPE can be challenging especially with face shields that can be heavy and loose-fitting | |
| Transfer of patients in and out of delivery suites presents huge challenges. Sanitation of the path after patient movement should be meticulous | Research into affordable transport systems may present solutions |

**Abbreviation:** PPE, personal protective equipment.
found to have an appropriately grown, term fetus in oblique lie. After counseling, the couple opted for a cesarean delivery the same day.

Written informed consent encompassed additionally the risks of COVID‐19 infection. Experienced obstetric, anesthesia, and neonatology teams performed their standard checks. The patient was transported to the operating theater through a preplanned corridor that minimized the risk of contamination. A lower‐segment cesarean delivery was performed under spinal anesthesia with delivery of a healthy male neonate who cried immediately. The newborn was transferred to the mother’s side, breast fed, and tested negative for COVID‐19 on day seven. The postnatal period was uneventful.

The strengths of our experience were a motivated and well‐trained staff and full cooperation from hospital administration to set up a near‐ideal facility. Simulation conducted before the actual scheduled procedure helped to minimize difficulties. The major challenges and limitations are summarized in Table 1.

In these times of a pandemic, every facility should be prepared to handle patients with suspected/confirmed COVID‐19. Since facilities in low‐resource countries are often short‐staffed and have limited space, it is important to optimize resources and establish local protocols. Preparedness is the key to success that can help deliver ideal services even in a less than ideal situation.

**AUTHOR CONTRIBUTIONS**

KAS, RK, GK, AC, RA, SK, and NB contributed significantly to development of the facility and patient management. KAS, NB, AS, and RA contributed to drafting the manuscript.

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**CONFLICTS OF INTEREST**

The authors have no conflicts of interest.

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**SUPPORTING INFORMATION**

Additional supporting information may be found online in the Supporting Information section at the end of the article.

**Video S1.** Layout of the COVID‐suspect area with donning, patient and newborn care, and doffing areas.