

Perioperative Anesthesia Management for a Laboring Mother with COVID-19 Infection for Low Segment Transverse Uterine Incision Cesarean Section: Case Report

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ABSTRACT

Recently, the need for cesarean section is enormously increasing and increasing, addressing the concern of anesthesia for cesarean section in a similar manner. Physiologic changes during pregnancy such as increased cardiac out, heart rate, and oxygen consumption, decreased lung compliance and capacity, a shift away from cell-mediated immunity, and increased risk of thromboembolic disease reduce maternal compensation during stress and certain pathological conditions like infections. Importantly, the provision of anesthesia for a pregnant mother is perceived as a challenging situation, because of the attending physiological, anatomical, and pharmacological changes of pregnancy. This culminates in the modification and dosage adjustment for certain medications specially sedative-hypnotics and delivery as well as management of anesthetic techniques, in the pace of optimizing and ensuring maternal organ function and fetal well-being.

Certain perioperative factors such as COVID-19 infection, comorbid disease and obstetrics complications increase the risk of maternal morbidity and mortality with a subsequent fetal compromise during the perioperative state, besides the aforementioned anesthetic challenges. Moreover, COVID-19 infection increases the perils of complicating pregnancy and pregnancy outcomes including maternal artificial ventilation and intensive care admission, preterm labor, fetal distress, neonatal intensive care admission, fetal and maternal death. Preventive strategies toward the spread of COVID-19 infection, vaccines, and the proper use of personnel protective equipment by health care providers reduce the spread and severity of COVID-19 infection and improve the obstetrics and pregnancy outcomes.

Keywords : Anesthesia; COVID-19; Cesarean-section; Obstetrics anesthesia; Pandemic; Pregnancy; Severe acute respiratory syndrome

INTRODUCTION

COVID-19 (severe acute respiratory syndrome coronavirus 2) pandemic outbreak became a major international concern of public health emergency. Even though the severity of the COVID-19 was around 4% of the early outcomes, this condition can accrue an increased resource burden associated with intensive care [1,2]. There was a great challenge in optimizing the health service delivery in health facilities including hospitals to handle only emergency cases, in a sense to address resource issues and reduce the risk of infections. Over all, this widespread

outbreak of COVID-19 compromises the health service and systems management lockdown. On top this, with the continuous transmission of COVID-19 epidemic, the urge of health systems, health professionals and stakeholders toward identifying the risk of this contagious infection, resource allocation and plan design had neglected or became deteriorating [3,4]. Pregnancy-related physiological changes; particularly involving the cardiovascular, respiratory, and immune systems in pregnant woman pose the vulnerability toward increased maternal and fetal complications in the presence of the COVID-19 virus. The infections of the virus

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during pregnancy incredibly increase the risk of serious morbidity including the need for artificial airways like endotracheal intubation, intensive unit care admission, renal failure, and death [5]. As the physiology of pregnancy decreases the pregnant women's response to certain infectious conditions like COVID-19 infection; which increase the risk of obstetrics and pregnancy complications such as maternal tracheal intubation, mechanical ventilation, intensive care admission, coagulopathy, preeclampsia, and maternal death. In addition, COVID-19 infection increases adverse obstetric and pregnancy outcomes, including miscarriage, preterm birth, intrauterine growth restriction, preterm premature rupture of membranes, fetal distress and neonatal intensive care, fetal death, stillbirth, and neonatal death [6]. On the other hand, health professionals and patients should be protected from contamination by this contagious virus [7]. In addition to the preventive strategies outlined by the World Health Organization to prevent COVID-19, the COVID-19 vaccine was established as a key novel protective measure to reduce the predisposition to disease during pregnancy. Evidence supported that, the use of COVID-19 vaccines of mRNA, viral vector, and protein subunits vaccines proved to have no adverse effect on pregnant women, the fetus, and or breastfeeding infants. Accordingly, some inactivated COVID-19 immunizations contain adjuvants like insoluble aluminum salts in Tdap and AS0-3 adjuvanted influenza vaccines are safely used during pregnancy. However, vaccines containing novel adjuvants are avoided in pregnant women as they increase the risk of pandemic leading to severe COVID-19 infection including death, and placental transfer of antibodies and through breastfeeding. COVID-19 vaccines provide protective effects for both, the mother and fetus against the adverse effects of COVID-19 infection; reduce the severity of COVID-19 infections during pregnancy, and may decrease the adverse effects on pregnancy outcomes [8]. We reported a case of women who experienced suspected COVID-19 infection and underwent emergency cesarean section under general anesthesia in a low-resource area.

CASE PRESENTATION

18 years old, first gravid mother (156 cm, 64 kg) at 37 weeks and 3 days gestation without any other obstetrics complications was transferred from another district hospital to Hawassa University Comprehensive Specialized Hospital. On admission, she had complained of low-grade intermittent fever, cough, fatigue, and shortness of breath of four days duration. She was presented with tachypnea, use of accessory respiratory muscles, and oxygen saturation of (90%-91%) on room air. A negative result for blood film and hepatitis B-surface antigen screen [9]. She was admitted to the obstetrics operation room for emergency cesarean section with the diagnosis of the prolonged second stage of labor, non-reassuring fetal heartbeats status (severe fetal bradycardia), and confirmed COVID-19 infection. The contact and droplet precaution was made throughout the procedures. Immediately upon arrival in the waiting room, we assessed the mother airway as mallampati class-II, adequate mouth opening (Inter-incisor gap of 4 cm), neck flexion/extension adequate, No missed or loosed teeth, and normal limits of sternomental and

thyromental distances. After placing standard monitors, an 18 G cannula was secured, and aspiration prophylaxis was given [10].

A due concern should be given to limiting the number of health professionals in the operation room during extubation. However, in the absence of personal protection materials like an N95 mask, and level 3 protections the anesthetist had used only surgical gloves before extubating the patient. At a deep level of anesthesia, suction was applied to the lower airway, and oropharynx to adequately remove secretions before extubation. At the time of extubation, propofol, intravenous lidocaine, and fentanyl were administered to combat or minimize the cough reflex. The patient was transferred to the post-anesthesia care unit and continuously monitored at the post-anesthesia care unit for 30 minutes and transferred to the COVID-19 ward with a medical face mask in place. The perils of postoperative deterioration can still be there, obligating the continued close monitoring of both the mother and the newborn (Figure 1).



Figure 1: Preparation of necessary equipment's for mother and the newborn patient.

Post-operative pain was addressed by the administration of titrating the dose of opioids. Adequate prophylaxis was given to combat postoperative nausea and vomiting, as it culminated in the viral-containing aerosol. A multitude of preventive strategies was used by identifying the precipitating factors. Routine monitoring, including pulse oximetry, non-invasive blood pressure, body temperature, bleeding tendency, and urine output were monitored thoroughly at the post-anesthesia care unit. The newborn was breastfed deemed after the mother adequately awoken from anesthesia. The mother was given instruction to put in place the medical face mask to minimize the cross-contamination of health care providers and patients and maintain hand hygiene. The newborn was tested on days 7 and 13 post-delivery using reverse transcriptase and became negative on two occasions. The mother was screened on days 14, 21, and 23 after the operation and discharged home after two negative results with her baby [11].

RESULTS AND DISCUSSION

Hawassa University Comprehensive Specialized Hospital is a referral center for high-risk pregnant mothers and while suiting a COVID center in the hospital that is constructed for other clinical care provisions being from the setup. This center was designated to provide clinical care for COVID-19 patient including an obstetrics facility to handle admitted women with suspected or confirmed COVID-infection and who need immediate care. The isolated COVID center comprises of emergency room, labor room, operation room, and post-anesthesia care unit with enough space for donning and doffing of Personal Protective Equipment by health professionals and respective wards. But, there exist resource constraints including personal protective equipment.

An emergency low segment transverse cesarean section was considered to be the safest option for this mother, as letting extra time increase fetal compromise, even though emergency cesarean section poses the need for general anesthesia and tracheal intubation, which increase the risk of aerosol generation and may decrease the success rate of first-pass tracheal intubation. In the present case, the fetus was in non-reassuring fetal heart status at term, which was primarily managed by emergency low segment cesarean section providing general anesthesia with tracheal intubation in our institution. Effective management of suspected or confirmed COVID-19 pregnant mothers needs a multidisciplinary team approach including anesthetists, obstetricians, nursing staff, infectious disease and critical care, and other important health care providers [12].

Pregnant women with confirmed COVID-19 infection should be counseled to inform their maternity unit, arrange antenatal care, and the important issues discussed during routine antenatal care. It is suggested to be good to delay institutional appointments for high-risk pregnant women with suspected or confirmed COVID-19 infection if the patient status allows until after the recommended period of self-isolation. For patients with suspected or confirmed COVID-19 infection, there should be a separate unit providing care, including a delivery room, delivery unit, and surgical gowns. During the acute COVID-19 infection illness it is considered to monitor fetal wellbeing. When a pregnant woman with suspected or confirmed COVID-19 infection is admitted to the delivery unit, all members of multidisciplinary teams should be informed [13]. It is essential to restrict the number of health providers caring for pregnant women with suspected or confirmed COVID-19 infection throughout labor, including the operating room teams. Proper and early multidisciplinary team discussion to facilitate the level of care and delivery plan is necessary. All procedures should be performed by the most experienced anesthetist available. A clear plan for emergency delivery is critical; should be discussed timely with all relevant senior personnel in the delivery unit. Neonatal teams should be informed of plans for delivery as the newborn may need intensive care unit admission. All staff should use personnel protective equipment.

Even though, personal protection against COVID -19 cross infection is a challenging situation for the surgical team during

Cesarean section because of exposure to highly contagious fluids such as blood, amniotic fluid, and other body fluids; it is pivotal to protect the mother and newborn safety while safeguarding them self from infection. The previous study showed that the use of level 3 personal protective equipment's reduces the risk of being infected by COVID-19. Furthermore, 2.7% of anesthetists infected by COVID-19 after providing anesthesia for the case of confirmed COVID-19 infection besides the use of personal protective equipment [14]. However, in our case, we had no experience with the COVID-19 cross-infection among health professionals during the management of the case of confirmed COVID-19 infection.

CONCLUSION

Unfortunately, it was a great challenge to balance the risk and benefit of delaying these time-sensitive obstetric emergencies in the pace of conserving critical resources such as personal protective equipment, and Intensive Care Unit beds for post-operative ventilator support if ensues. In general, we successfully provide general anesthesia and deliver the baby of the confirmed COVID-19 infection case who underwent low segment transverse uterine incision cesarean section under general anesthesia in this low-resource area without any perioperative complications.

INFORMED CONSENT

The authors ensure or record that they had received proper patient consent. The patient was given her consent for her clinical data to be incorporated into the paper. Confidentiality will be maintained throughout, with due concern will be made to protect her privacy.

CONSENT FOR PUBLICATION

Written informed consent for the publication of this data was obtained from the patient.

DATA AVAILABILITY

Data will be availed by the corresponding author upon reasonable request.

AUTHOR CONTRIBUTIONS

All the authors cited in the manuscript had substantial contributions to the concept and design, the execution of the work, or the analysis and interpretation of data, drafting or revising the manuscript, and have read and approved the final version of the paper.

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CONFLICT OF INTEREST

No

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