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COVID 19 AND OBSTETRIC ANAESTHESIA

Anesthesiology

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ABSTRACT

Covid 19 infection caused by the novel coronavirus Sars Cov-2 has become a global pandemic. Due to a high human to human transmission rate of the virus and the physiological changes of pregnancy, these patients may be at high risk. Obstetric anaesthesia including antenatal perioperative and postoperative care of pregnant patients and protection of health care workers from infection is an important area for anaesthetic management

KEYWORDS

Covid, pregnancy, perioperative anaesthetic management

INTRODUCTION

COVID 19 infection was first found in Wuhan, China on December 2019 [1] since then it has grown exponentially to be declared a pandemic on March 11 2020 by WHO. [2]

	Mild	MO	SEVERE
Clinical Criteria			
SPO2	> 94 % in Room Air	90 - 94 % in Room Air	< 90 % in Room Air
RR	< 24 / min	24 – 30	> 30
	No Pneumonia	Pneumonia +	Pneumonia ++
Laboratory Findings (Expected)			
NLR	< 3.2	> 3.2	> 5.5
CRP	< 40	40 – 125	> 125
Ferritin	< 500	> 500	> 800
D-Dimer	< 0.5	> 0.5	> 1.0
LDH	< 300	300 – 400	> 400
IL6	< 4.8	5 – 50	> 80
LFT	Normal	Slight Derangement	Moderate Derangement
Treatment			
Routine	T. Paracetamol 500 mg TDS	T. Paracetamol 500 mg TDS	T. Paracetamol 500 mg TDS
	Anti-tussives SOS	Anti-tussives SOS	Anti-tussives SOS
	T. Vitamin C 500 mg OD	T. Vitamin C 500 mg BD	T. Vitamin C 500 mg BD
	T. Zinc 50 mg BD	T. Zinc 50 mg BD	T. Zinc 50 mg BD
	C. Omeprazole 20 mg BD	C. Omeprazole 20 mg BD	Inj. Pantoprazole 40 mg IV OD
Fluids	Adequate Hydration - Oral	Adequate Hydration - NS	Conservative Fluids
HCQ (Not prescribed routinely)	T. HCQ Day 1 - 400 mg BD Then 400 mg OD x 4 Days	T. HCQ Day 1 - 400 mg BD then 400 mg OD x 4 Days	-
Antibiotics	T. Azithromycin 500 mg OD x 5 Days (or) T. AmoxClav 625 BD if T. Azithromycin is contraindicated	T. Azithromycin 500 mg OD x 5 Days + Inj. Ceftriaxone 1 gm IV BD if secondary bacterial infection suspected	T. Azithromycin 500 mg OD x 5 Days + Inj. Piptaz 4.5 mg/ Inj meropenam 500mg IV TDS if secondary bacterial infection suspected

Mode of transmission

The virus replicates in the respiratory epithelium and spreads via: -Droplets – Detectable in air for upto 3 hours upto a 1-2m radius [3] -Aerosols (small particle nuclei, may penetrate standard surgical masks) remain suspended for hours in the air contaminating a wider dispersing radius and greater number of individuals.[4] -Fomites- Viable on surfaces for upto 72 hours, viral transmission from asymptomatic individuals possible. [5]

Pregnant women do not appear more susceptible to the infection than the general population [6].

Emerging evidence suggests that vertical transmission of the virus from woman to her baby antenatally or intrapartum is possible [7] but further investigation is needed and ongoing. [8]

Clinical features

Most pregnant women experience mild/cold or flu like symptoms. Others include Cough , Fatigue ,Shortness of breath ,Myalgia , diarrhoea, anosmia, ageusia. [9]

Physiological changes in pregnancy to the immune system can cause severe symptoms in viral infections but there is currently no evidence that pregnant women with COVID 19 are more likely to be critically unwell. [10]

Current data do not suggest an increased risk of miscarriage ,early pregnancy loss or birth defects in pregnancies with COVID-19 [11] but Cases of preterm delivery have been seen [12],

Current treatment protocol for COVID 19 patients

Specific diagnostic tests approved by ICMR in practice now - RT-PCR (gold standard), CBNAAT, TRUENAT, Rapid antigen test and Antibody test (IgM and IgG) Trial therapies- Inj. Remdesivir 200mg IV OD on Day 1 and 100 mg IV OD x 4d -Convalescent Plasma 200 ml slow IV Single Dose -Lopinavir 400 mg + Ritonavir 100 mg) Twice Daily x 14 Days+ Interferon Beta 8 Million IU on Alternate Days x 3 Doses [13]

*NLR1- Neutrophil leucocyte ratio, CRP- C Reactive protein, LDH- Lactate dehydrogenase, IL6- Interleukin 6, LFT- Liver Function test, NRM- Non rebreathing mask, HFNC- High Flow Nasal Cannula, CPAP- Continuous Positive Airway Pressure, MV-

Anticoagulation	-	Inj. Enoxaparin 40 mg SC OD x 5 Days Inj. Dalteparin 2500 IU SC OD ×5 days In ESRD, UH – 5000U SC BD can be used	Inj. Enoxaparin 40 mg SC BD x 5 Days Inj. Dalteparin 5000 IU SC OD × 5 day In ESRD, UH – 5000U SC BD can be used
Steroids	-	Inj. Dexamethasone 0.1 – 0.2 mg /kg ≈ 6 mg IV OD x 5 Days or inj. Methyl Prednisolone 0.5 -1 mg/kg ≈ 60mg x 5 Days	Inj. Dexamethasone 0.2 – 0.4 mg /kg ≈ 6 mg IV BD x 10 Days or inj. Methyl Prednisolone 1.0 -2.0 mg/kg ≈ 80 mg x 10 Days
Oxygen Support	Not Required	Maintain Target SPo2 of 92 to 96 % Nasal Prongs (4 lit / min) ↓ Face Mask (5-10 lit / min) ↓ NRM (10 -15 lit / min) ↓ HFNC (10 - 40 lit / min) ↓ CPAP (TV 6ml/kg; PEEP 5-15 cm H20; Target PP 30 cm H20)	Maintain Target SPo2 > 90 % NRM (10 -15 lit / min) ↓ HFNC (10 - 60 lit / min) ↓ CPAP (TV 6ml/kg; PEEP 5-15 cm H20; Target PP 30 cm H20) ↓ MV (ARDS Protocol)
Proning	-	Awake Proning (if > 4 L / min)	Prone Ventilation 16 to 18 hrs / Day
Cytokine Storm	-	Inj. Toculizumab 400 mg (max 800 mg) slow IV in 100 ml NS over 1 Hour	-

Neuraxial analgesia- There is no current evidence that its use in COVID 19 patients is contraindicated. Early epidural placement is recommended -

(1) Helps avoid exacerbation of respiratory status by labor pain relief

(2) Reduces the need for GA if cesarian delivery is planned intrapartum Check platelet counts before block and before removal of catheter- Mild thrombocytopenia common in non-pregnant patients with COVID-19. [17] Pregnancy is associated with an increase in platelet aggregation and decrease in circulating platelets,[18]. All standard contraindications to neuraxial block apply.

Droplet precautions for all health care workers in the room (Labor ventilation and neuraxial block placement -not an aerosol-generating procedure) [19]

The patient should wear a surgical mask at all times. A dedicated anaesthesia cart and machine is recommended due to difficulty in disinfecting anaesthesia workspaces. If not the non dedicated cart should be left outside the room. [20]

All PPE donning and paperwork outside the labour room.The most senior provider should perform the procedure with one nurse to assist. Positioning table for position support for patient instead of a health care worker.

An assistant- available outside the room to hand over equipment. After careful doffing, dispose of equipment, drugs, and PPE and complete paperwork.

Temperature monitoring during labour and appropriate management of fever [21]

Anaesthesia for Cesarian delivery

Pre-operative preparation

Avoid auscultation with a stethoscope to reduce cross-infection. Document vitals.

If patient in respiratory distress or hypoxaemic, involve the intensive care team, before commencing anaesthesia for surgery for post operative critical care management.

Intraoperative care

Dedicated operation theatres should be prepared for COVID 19 patients during the pandemic with essential equipment only inside and disposable monitors and equipment.

Elective cesarians should be scheduled at the end of the operating list. And emergency cesarians in a second obstetric theatre, where available, allowing time for a full postoperative theatre deep cleaning. Assistant outside theatre to supply emergency drugs and equipment The chance of requiring conversion to a GA during a caesarean birth commenced under regional anaesthesia is small, but increases with the urgency of caesarean birth . If there is significant risk or if GA is planned from the outset, all staff in theatre should don PPE prior to commencing the GA. The time delays due to donning of PPE which can affect decision-delivery time should be explained to all women presenting in labour. [16]

Maintain proper clean intra-operative record of care Neuraxial anaesthesia (epidural extension of labour analgesia, spinal or CSE anaesthesia) is preferred.Consider measures to avoid conversion to general anaesthesia – denovo Spinal anaesthesia rather than prolonging a poorly functioning labour epidural analgesia, or use CSE anaesthesia.

There is a likelihood of excessive hypotension in a patient with COVID-19 and an increased requirement for vasopressors so prophylactic intravenous infusion of a vasopressor recommended . [22] Give uterotonics by slow bolus or infusion.

General anaesthesia

Tracheal intubation and extubation are AGPs thus increasing the risk of viral transmission to healthcare workers. The effect of tracheal intubation on a patient with acute respiratory compromise is another concern.

Intubation checklists developed for intubation of COVID 19 patients should be used. [23]

Antacid prophylaxis as routine

Use checklists for closed loop communication because the PPEs can impair verbal communication. [24]

Preoxygenation mandatory due to risk of rapid desaturation following induction -impaired respiratory function and pregnancy-related reduction in lung capacity. Connect a HEPA or HMEF filter to the Y piece on the patient's side before pre-oxygenation. [25] Avoid high flow nasal oxygen or facemask oxygen due to risk of aerosolization. Gentle, low-pressure manual ventilation with two hand technique and a tight seal on the face mask or a supraglottic airway device may be required.

Double gloves and in some places even triple gloves are used when intubating the patient.[25]its an extra layer of protection and the outer glove can be used as a sheath for the laryngoscope blade after use. Rapid sequence induction to minimize the risk of aspiration and avoid manual mask ventilation[26]

Ensure satisfactory depth of anesthesia and paralysis on induction to avoid coughing during intubation.

Increased risk of difficult and failed airway management in obstetric practice [27] hence the most skilled anaesthetist should intubate the patient and use videolaryngoscope for intubation.

Maintain a reasonable distance between the provider and patient's faces and decrease procedure time.

Cardiovascular collapse following induction of anaesthesia has been reported in the non-obstetric population with severe COVID-19 so vasopressors should be immediately available for managing hypotension.

Avoid unnecessary disconnections of circuit. If needed clamp between the HMEF and the circuit /endotracheal tube before disconnection. Attach extensions before intubation Decontaminate the work surfaces around the patient's head and the anaesthetic machine after intubation to reduce fomite transmission. Extubation is a more critical event than intubation due to the higher chances of coughing and spreading the virus.

Routine prophylactic antiemetics minimize environmental contamination from vomiting.

A recent analysis has evaluated pharmacological methods to minimise emergence coughing after general anaesthesia with tracheal intubation. [28] (dexmedetomidine, remifentanil, fentanyl, intra-cuff or intravenous lidocaine and lidocaine via tracheal or topical application) and found to be better than placebo or no medication. Immediate and proper disposal of the endotracheal, suction and oro-gastric tubes to decrease contamination.

During transport, intubated patients should have an HMEF filter between the self-inflating bag and the patient. Non-intubated patients should wear a surgical mask.

Postpartum

Judicious fluid management, surveillance for respiratory decompensation, and early involvement of subspecialty care as needed should be done Precautionary separation of neonate from the mother until she tests negative for COVID-19.[8,16]

Asymptomatic or mild symptoms- breastfeeding and rooming-in can be considered with strict adherence to hand hygiene and droplet precautions. The benefits of breastfeeding outweigh any potential risks of transmission of the virus through breastmilk. [16] Severe or critically ill mother- separation of neonate with attempts to express breastmilk. Use a dedicated breast pump which must be thoroughly washed after each feed[29]

Oxytocin and methylergonovine recommended for post partum hemorrhage. Avoid carboprost due to the potential for bronchospasm and risk of aerosolization during bronchospasm management. [30] Asymptomatic or mild pain- Acetaminophen and NSAIDs safe [31] as the alternative of opioids likely poses more clinical risks.

CONCLUSION

Obstretic anaesthesia in the times of COVID 19 pandemic comes with its own set of challenges. Strict and judicious use of the standard operating protocols is necessary for the safety of the mother and health care worker.

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