SOCIETY OF MEANINGFUL LIFE MANAGEMENT

"SMLM CALLING!"

UPDATE
COVID 19 AND PREGNANCY

President Message

Dr. Maninder Ahuja

President SMLM

It gives me immense pleasure to introduce BRIDGING THE GAPS series from SMLM.

COVID 19 has set unprecedented challenges in the lives of humanity. Everything that was built up over decades, has been set to rumbles in the last two years.

Antenatal bookings have declined, Perinatal mortality and morbidity has increased and pregnant population has been directly affected by the disease.

In second wave, higher mortality rate was observed. At present, we are left on the mercy of vaccination to fight the dread.

To discuss various aspects of vaccination and disease affection in pregnancy and lactation, a webinar was planned with national and international faculty to bridge the gaps between existing knowledge and evidence.

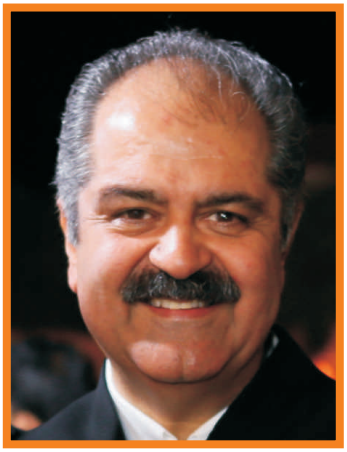
SMLM is moving ahead with its AIM of Going Digital with medical updates and taking up new and controversial topics so that we are able to bring out some concrete data and way forward !, Bridging The Gaps is one of series. Our other missions are Solution Finding for Healthy Health care for Country and Third is reaching out to Public with Right Messages

Regards

Dr. Narendra Malhotra

KOL SMLM

Congratulations to SMLM for bringing out this newsletter on the Hot topic by Cool Experts. We have to pool in data and knowledge, so as to build up the best snx most practical evidence to combat COVID 19. pregnant women are a High risk group and second wave has shown no empathy to them. All the collective information will help us to provide best care to this population.Best wishes



Dr. Ashok Khurana

KOL SMLM

History has witnessed epidemics and pandemics from time to time. And as we know, every time it devastated humanity. Populations are swept over a small time period. This time, may be due to advances in technology and science, we were able to fight with might or may be all our technology failed us. Pregnancy is a very delicate journey, and India contains 20 million pregnant females. Such a large group is at risk of contracting this SARS COV -V virus, so we need special education and efforts to mitigate the same. I am happy to learn that SMLM is putting up updates on bridging the gaps in this direction. I hope

Editor's Message

Dr. Shehla Jamal

Sml I'm calling update brings forward first in the series of covid-19 and pregnancy we have witnessed a mass destruction of facilities and we all witnessed second wave of covid-19 was more disastrous in pregnancy in its second occurrence covid-19 infection was more severe leads to more ecstatic morbidities and mortalities and all the previous research an efforts had to be overhauled so that better pregnancy outcome can be provided. Continuing our efforts s m l m is bringing out its knowledge update series on various topics and covid-19 in pregnancy lactation and vaccination will be released in three parts we wish all the readers and enhance knowledge and enriching experience

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FREQUENTLY ASKED QUESTIONS

Dr. Shehla Jamal

Dr. Akansha Tyagi

1. Can A Pregnant Women Take The Covid 19 Jab ?
   Ans. As Per ***WHO Guidelines May 2021:*** - Vaccinate The At Risk Pregnant Women.
   As Per RCOG Guidelines – In The Later Stages Of Pregnancy, Women Are At Increased Risk Of Becoming Seriously Unwell With Covid 19 And Vaccination Is Effective In Preventing The Infection And Is The Best Protection For The Female And The Baby .***Mohfw, Goi*** – Till Date Has Given No Recommendations WHICH MANDATES Taking Covid 19Vaccine For Pregnant Females.

2. Are There Any Pre Vaccination Warning Signs Which I Need To Be Wary Of?
   Ans. Persistant Headache, SHORTNESS OF BREATH , Hemoptysis, Pain In Labdomen, Or Leg Pain.
3. Can I Continue Taking The Vaccine Even If –Pregnancy Is Diagnosed After 1st Dose Of The Covid 19 Vaccine?
   Ans . As Per ***WHO Guidelines*** If 1st Dose Given AND Then Pregnancy Is Diagnosed, Still 2nd Dose Of Vaccine Can Be Taken. No Need To Hamper The 2nd Dose. Take It At The Stated Time (After 12 Weeks Preferably).

4. Does The Covid 19 Vaccination Affect One's Fertility Status In The Longer Run After Taking The Vaccination?
   Ans. No, There Are No Reports As Of Now Suggestive Of Impaired Fertility Status In The People Who Have Undertaken The Vaccination.

5. Can Breastfeeding Women Take The Vaccination?
   Ans. Lactating Women Are Allowed To Take The Vaccination As Per The Latest Recommendations Given By ***RCOG, MOHFW***, Etc.

6. I Am Planning For Conception, Can I Still Take The Vaccination?
   Ans. Yes. Your Vaccination Does Not Impede Your Chances Of Conception.

7. Are All The Different Available Covid 19 Vaccinations Safe For Administration?
   Ans. All Available Covid-19 Vaccines Are Proven To Be Safe And Highly Effective. Pregnant And Nonpregnant FEMALES Can Choose To Get Any Of The Available Vaccines.

8. Is Tocilizumab Recommended For Covid 19 Patients ?
   Ans. Tocilizumab Is Indicated For Patient With Severe Disease Variety Group.

9. Can Steroids Be Administered To A Covid – 19 Patient Routinely?
   Ans. No, Indicated Only In Mod To Severe And If Mild Cases Cross 7 Days Period Only After A Consultation With A Physician, Steroids Administration Can Be Done.

10. Do The Covid 19 Vaccines Have Any Side Effects?
    Ans. It Is Common To Feel Side Effects After Getting A Covid-19 Vaccine.. Some Vaccines May Make You May Feel Like You Have The Flu For A Few Days. There Are Different Types Of Covid-19 Vaccines That Have Varying Side Effects. Side Effects Also Vary From Person To Person

11. Is There Any Role Of Remdesivir In Treating Covid 19 Infection?
    Ans. Mod To Severe Variety Of Patients Requiring Supplemental Oxygen And Within 10 Days Of Symptom Onset With No Signs Of Renal Or Hepatic Toxicity Can Safely Administer Remdesivir.

12. Should A Covid 19 Positive Women Be Offered Delivery , If Near Term?
    Ans. Covid 19 Status Per Se Is Not An Indication
    For Elective Delivery Even If She Is On Oxygen Or Mechanical Ventilation. Need For Delivery Is Dependent Upon Maternal Status, Fetus Viability Etc.

13. Is Covid 19 An Indication For C Section.?
    Ans . For Patients With Severe Or Critical Patient C/ Section Is An Indication Only For Standard Obstetric Indications , With Concerns Of Acute Decompensation Of Intubation For Critically Ill Patients.

15. Should Breastfeeding Be Withhold 24 Hours After Covid 19 Vaccination?
    Ans. No, There Are No Recommendations Suggesting Withholding Of Breastfeeding 24 Hours After Vaccination.

16. I Was Tested For Covid 19 Recently, How Much Do I Need To Wait To Undergo Elective Surgeries?
    Ans. As Per ***The ICMR Guidelines***, A Waiting Period Of 4 Weeks For An Asymptomatic Patient. 6 Weeks For Symptomatic Patients, 8-10 Weeks For Symptomatic Patients Who Is Diabetic Or Has History Of Admission. 12 Weeks For Patient With Icu Admission.

17. I Contracted Covid 19 Infection Recently, When Am I Applicable To Take My Covid 19 Vaccine Shot?
    Ans. As Per ***MOHFW GOI Guidelines*** If Covid Positive , Vaccine To Be Given 3 Months After Recovery.

18. Should I Need To Undergo Screening By Rapid Antigen Test Prior To Covid 19 Vaccination.
    Ans. No There Is No Guideline That Mandates Testing Before Vaccination.

19. When Can I Go For Blood Transfusion After Getting Vaccinated?
    Ans. It Can Be Done 14 Days After Vaccination Or 14 Days After Testing Rtpcr Negative After Covid 19 Illness.- ***MOHFW***

20. If A Person Required Icu / Hospitalisation For Any Other Serious Illness then ?
    Ans. Waiting Period Of 1- 2 Months Is Recommended.

21. If A Covid Patient Received Plasma Therapy Or Antibodies , When Can She Administer Covid 19 Vaccine?
    Ans. Vaccine Is To Be Given 3 Months After Discharge.- ***MOHFW***

Myths and Facts - Part 2 Covid 19 Vaccine

Dr. A K Pandey

Dr. Asha Rijsinghani

The COVID-19 Vaccines will change nothing in your body, but they will teach your immune system to protect you from the corona virus. In effect, the principle of vaccination is to “mimic” an infection, but in a controlled way so that immunity is generated without causing illness. After a few weeks, once T cells and B cells have been generated, the person vaccinated will be protected.

VACCINE-Facts and Myths

Myth: The COVID-19 vaccine is unsafe because it was developed so quickly

Fact: The authorized vaccines are proven safe? and effective. Although they were developed in record time, they have gone through the same rigorous regulatory process as other vaccines, meeting all safety standards. No steps were skipped. Instead, we should thank the unprecedented worldwide collaboration and investment for the shorter timeframe on the development of the vaccines. The clinical trials and safety reviews actually took about the same amount of time as other vaccines.

Myth: The COVID-19 vaccine will alter my DNA

Fact: The first vaccines granted emergency use authorization contain messenger RNA (mRNA), which instructs cells to make the “spike protein” found on the new Coronavirus. When the immune system recognizes this protein, it builds an immune response by creating antibodies — teaching the body how to protect against future infection. The mRNA never enters the nucleus of the cell, which is where our DNA (genetic material) is kept. The body gets rid of the mRNA soon after it's finished using the instructions.

Myth: The COVID-19 vaccine includes a tracking device.

Fact: A video shared thousands of times on Facebook makes false claims about the products of syringe maker Apiject Systems of America, which has a contract with the government to provide medical-grade injection devices for vaccines. The company has an optional version of its product that contains a microchip within the syringe label that helps providers confirm a vaccine dose's origin. The chip itself is not injected into the person getting the vaccine.

Myth: The COVID-19 vaccine has severe side effects.

Fact: Some participants in the vaccine clinical trials did report side effects similar to those experienced with other vaccines, including muscle pain, chills and headache. Although extremely rare, people can have severe allergic reactions to ingredients used in a vaccine. That's why experts recommend people with a history of severe allergic reactions — such as anaphylaxis — to the ingredients of the vaccine should not get the vaccination.

Myth: The COVID-19 vaccine causes infertility in women.

Fact: Misinformation on social media suggests the vaccine trains the body to attack syncytin-1, a protein in the placenta, which could lead to infertility in women. The truth is, there's an amino acid sequence shared between the spike protein and a placental protein; however, it's too short to trigger an immune response and therefore doesn't affect fertility.

Myth: Once I receive the COVID-19 vaccine, I no longer need to wear a mask.

Fact: Masking, hand washing and physical distancing remain necessary in public until a sufficient number of people are immune (> 70%). Fully vaccinated people can meet with other fully vaccinated people without wearing masks (CDC guidelines but not implemented in India)

Myth: I have already been diagnosed with COVID-19, so I don't need to receive the vaccine.

Fact: If you have already had COVID-19, there's evidence that you can still benefit from the vaccine. At this time, experts don't know how long someone is protected from getting sick again after recovering from COVID-19. The immunity someone gains from having an infection, called natural immunity, varies from person to person. Some early evidence suggests natural immunity may not last very long.

Myth: You can get COVID-19 from the vaccine.

Fact: You cannot get COVID-19 from the vaccine because it doesn't contain the live virus.

Myth: Certain blood types have less severe COVID-19 infections, so getting a vaccine isn't necessary.

Fact: Research has shown there is no reason to believe being a certain blood type will lead to increased severity of COVID-19. By choosing to get vaccinated, you are protecting not only yourself and your familybut your community as well.

NOW VACCINE IS APPROVED FOR PREGNANT WOMEN & LACTATING MOTHER
VACCINE APPROVED ARE COVAXIN, SPUTNIK AND COVISHIELD

Vaccine Approved & Under Trial in INDIA

Table 1: Vaccines approved for use in India

Vaccine (Company name)	Dosage	Type of vaccine	Efficacy	Remarks
Covishield (Serum Institute of India)	2 doses im 12-16 weeks apart	Non replicating viral vector vaccine (using recombinant Chimpanzee adenovirus as vector, encoding SARS CoV2 Spike (S) glycoprotein	70-80%	Phase III completed
Covaxin (ICMR & Bharat biotech)	2 doses im 4-6 weeks apart	Whole virion killed virus vaccine	81%	Phase III completed Paediatric study trial ongoing
Sputnik V (Gamaleya Institute, Russia)	2 doses im 21 days apart	Non replicating double viral vector vaccine	91.6%	Phase III to be completed

Table 2: Vaccines under trial in India

Vaccine (Company name)	Dosage	Type of vaccine	Remarks
ZyCoV-D (Zydus Cadilla	3 doses intradermal at 0,28,56 days	Indigenous recombinant DNA vaccine	Completing Phase III
CORBEVAX (Biological E limited)	2 doses im 28 days apart	Recombinant protein vaccine	Completing Phase II
Ub612 (Vaxxinity Inc)	2 doses im 28 days apart	Recombinant protein vaccine	To start Phase II & III
Arct-021 (Arcturus)	Single im dose	mRNA vaccine	To start Phase II
BBV154 (Bharat biotech)	Intranasal	Intranasal Adenoviral vector COVID-19 vaccine	Phase I
HGCO19 (Gennova Biopharm. Ltd.)	2 doses Im 28 days apart	first indigenously developed self-replicating mRNA vaccine	In Phase I & II
Covovax (ICMR & Serum Institute of India jointly)	-	Recombinant spike protein nanoparticle vaccine (SARS-CoV-2 rS) with Matrix-M1™ adjuvant	In Phase II & III
COVID-Vac (Hetero-Biopharma)	2 doses Im 21 days apart	Combined Vector vaccine	Phase II completed started

Covid 19 and Covid 19 Vaccination in Pregnancy

In 2020, 1st wave though large in number, pregnant ladies were mainly asymptomatic, with a very negligible vertical transmission rate. **However as with most centers around the world, cesarean section rates were rather high to the tune of almost 52%. WHILE** In 2021, in the 2nd wave as it may be, symptomatic pregnant women appeared to be on the rise. Even severity of disease was seemingly higher. Although the absolute risk of severe COVID-19 in pregnancy remained a low, it is now established that pregnant women are at increased risk of severe COVID-19-associated illness compared with non-pregnant women. (FIGO Statement 2 March 2021). ALL COMPLICATIONS OF NORMAL PREGNANCY SEEN WITH COVID +VE CASES ALSO. As depicted in the table.

Effects OF Covid-19 on Fetus

No data suggesting an increased risk of miscarriage or early pregnancy loss. No evidence of teratogenicity. Not an indication for Medical Termination of Pregnancy or change in antenatal care, mode of delivery or Postnatal care.

COVID 19 POSITIVE WOMEN WITH ASSOCIATED OBSTETRICAL/MEDICO SURGICAL COMORBIDITIES

Medical comorbidities	Number of patients
Heart disease	11
Concurrent covid & dengue	5
Acute pancreatitis	2
Acute hepatitis	4
Chronic renal disease	5
Psychiatric disorder (malignant catatonia, major depression)	4
POCSO	2

Experience so far(April 2020 –TILL DATE)

- Total pregnant/postpartum women screened = 5,160
- Total number of pregnant/postpartum tested positive for COVID 19 = 350.
  TOTAL CAESAREAN DONE=180
  TOTAL VAGINAL DELIVERY=89

Experience with first wave

(April 2020 - Feb 2021)

Total number of pregnant/postpartum woman screened= 4475

- Number of women turned out to be positive= 198
- % of women turned out to be positive= 5%
- Asymptomatic =185(93%)
- Mild symptoms (cough, fever)=10(5%)
- Covid pneumonia =3,(1.5%) two required steroids
  Vertical transmission 2(1%)

EXPERIENCE WITH 2ND WAVE (UNPUBLISHED DATA BY DR BHARTI JOSHI) (MARCH 2021-TILL 21/5/21)

- Total screened =685
- Number of women turned out to be positive= 152
- Positivity rate= 22%
- Asymptomatic= 60(39%)
- Flu like symptoms=70(46%)
- Moderate to severe illness=22 (14%)

What was the difference?

So more pregnant women involved

- More severity
- More complications
- All of us have seen more death.

Previous experience of viral Infections

H1N1 influenza pandemic, pregnancy caused a higher risk of severe pneumonia, ARDS, mechanical ventilation, and death when compared with reproductive-aged non-pregnant women (Jamieson et al., 2009).

Similar results were also reported for the severe acute respiratory distress syndrome (SARS) and Middle East respiratory distress syndrome (MERS) epidemics, (Rasmussen and Jamieson, 2020; Schwartz and Graham, 2020; Wang et al., 2020a,b).

Categorization of COVID 19 in pregnancy

Pregnancy is an immunomodulatory state.

- Hence as per ICMR guidelines consider all pregnant women into category B .
- A thorough history, especially about covid symptomatology, extensive review of records, and a well done general and Obstetric examination is a must before further categorization.

Categorization of COVID 19 in pregnancy

- **Category B1 :** The asymptomatic pregnant woman/very mild symptoms

  Category B2 : The pregnant woman with symptoms (fever, cough, sore throat) or diarrhea or fatigue, or those with co morbidities like hypertension, diabetes, liver disease, renal disease.

  Category C: The pregnant woman with either breathlessness, chest pain, drowsiness, or hypotension hemoptysis, cyanosis [red flag signs].

  (Categorization should be reassessed every 24-48 hours for Category B1 & B2 based on symptoms and walk test.)

Table 1	National Institutes of Health COVID-19 Disease Severity Criteria[12]
Asymptomatic	Positive COVID-19 test result with no symptoms; unable to determine whether presymptomatic or asymptomatic
Mild	Cold symptoms to flulike illness (including fever, cough, myalgias, anosmia) without lower respiratory findings (dyspnea, abnormal chest imaging)
Moderate	Lower respiratory tract disease on clinical assessment (including dyspnea, crackles, CXR infiltrates) with oxygen saturation at 94% or greater on room air at sea level
Severe	Oxygen saturation less than 94% on room air, oxygen requirement, respiratory rate greater than 30 breaths per minute, ratio of P_{AO_2}:F_{IO_2} less than 300, chest imaging with greater than 50% lung involvement
Critical	Respiratory failure, requirement of mechanical ventilation or high-flow nasal cannula, multiorgan failure or dysfunction

Adapted from https://www.covid19treatmentguidelines.nih.gov/overview/clinical-spectrum/

CLINICAL STAGES OF SEVERITY

- **Mild** : no breathlessness or hypoxia, RR < 24/mt, spO2 > 94% on room air, and otherwise asymptomatic.
- **Moderate:** Dyspnea and / or hypoxia , RR 24-29/mt, spO2 91-94% on room air, or fever and cough.
- **Severe:** Dyspnea and / or hypoxia RR> 30 breaths/mt or spO2 < 90% on room air or a pulse rate > 125/mt with or without pneumonia.

EXACTLY WHAT HAS TO BE MONITORED ?

Pulse (by pulse oximeter)

- Spo2,
- Temperature
- Breathing
- Any accessory muscle of breathing ?
- How to tell her perfect use of hand held pulse oximeter
- Walk test after walking for 6 min check for oxygen saturation if fall by
- 3 % patient should be advised admission.

When to Admit ?

Rise in temperature

- If Spo2 falls < 95
- Cough persists
- Or obstetrics indication for admission

CRITERION FOR ADMISSION TO HOSPITAL

- Persistent fever >38°C despite using paracetamol
- Chest X-ray demonstrating pneumonia
- Pregnant women with other co-morbidities like chronic hypertension, obstructive pulmonary disease, pregestational diabetes, immunosuppression, organ transplant recipients, HIV infection with <350 CD4+ cells, or patients who receive corticosteroids equivalent to >20 mg of prednisone for >2 weeks, use of immunosuppressive drugs, neutropenia, etc.) must be carefully evaluated by an infectious disease specialist
- CURB severity scale with a total score >0 (each item gives a score of one point):
  C: Acute confusion
  U: Urea >19 mg/dL
  R: ≥30 bpm
  B: SBP ≤90 mm Hg or DBP ≤60 mm Hg
- Intensive care unit admission criteria (Table 2)

COVID-19, coronavirus disease 2019; DBP, diastolic blood pressure; SBP, systolic blood pressure.

ADVICE DURING HOME ISOLATION

Diet, Deep breathing, Hydration, Ventilated room, Hand hygiene, Separate bathroom, Isolation from other members, Mask whenever in contact. Treatment may include paracetamol

Anti-tussives

Routine iron, calcium and folic acid.
If less than 32 weeks prone position or left lateral position

ALGORITHM FOR MANAGEMENT

- ✓ Persistent fever >38°C despite paracetamol
- ✓ Imaging criteria of pneumonia
- ✓ Presence of co-morbidities: chronic hypertension, pregestational diabetes, obstructive pulmonary disease, renal insufficiency, immunosuppression
- ✓ CURB severity score >0
  - Confusion (acute)
  - Urea >19 mg/dL
  - Respiratory rate ≥30 bpm
  - Blood pressure: systolic ≤90 or diastolic ≤60 mm Hg

None → **Home isolation**

- Hydration
- If needed, paracetamol up to 4 g/d
- Phone follow-up: 24 h, 48 h, and 7 d
- Postponement of routine visits for 4 w

Any → **Admission**

- Avoid fluid overload
- Antivirals: lopinavir/ritonavir 7–14 d (COMPASSIONATE USE)
- Hydroxychloroquine/4 d (COMPASSIONATE USE)
- Azithromycin/4 d
- Prophylactic LMWH (maintain 2 weeks after discharge) (consider unfractioned if imminent risk of delivery)
- If alveolar infiltrate and/or elevated procalcitonin, consider starting ceftriaxone + teicoplanin
- Keep SO_2 >94%: nasal cannula ≥ Venturi mask ≥ CPAP ≥ ...
- Monitor fetal heart rate (CTG if >28 weeks)
- Consider delivery if unstable after 32–34 weeks

Category **B2: monitoring**

These women need indoor evaluation & symptomatic treatment

- Treatment may include paracetamol, anti-tussives in addition to the routine iron, calcium and folic acid. MDI/DPI Budesonide 800mcg twice a day can be started if symptoms (fever and/or cough) are persistent beyond 5 days of disease onset
- Lab investigations to be sent are CBC, RFT, LFT, RBS, S.electrolytes, ECG, CRP.
- Additional markers like d-dimer, Ferritin, CPK are to be sent if persistent symptoms.

WHEN DO WE NEED XRAY AND WHEN IS HRCT SCAN A MUST ?

It may be advisable to ask for an X-ray chest PA view with lead shielding of the abdomen in all cases who have a persistent cough.

- CT pulmonary angiography (CTA) should be considered when hypoxia or tachycardia persist despite minimal opacities demonstrated on chest
- Radiography or when clinical suspicion for pulmonary embolism is high.

Monitoring OF Moderate Cases

They should be monitored by thrice daily recording of Temperature, Pulse rate, respiratory rate, SPo2 and Walk test and review of symptoms.

- Oxygen administration as and when Required
- Once patients have been worked up and are stable with subsidence of symptoms, they can go into home quarantine with the same checks as detailed for others on quarantine

PICS of oxygen devices

OXYGEN DELIVERY SYSTEMS

Device: Nasal Cannula
Flow: 1 - 6 L/min
FiO2: 25 - 40%
(~4%/L of flow)

Device: Face Mask
Flow: 5 - 10 L/min
FiO2: 40 - 60%

Device: Face Tent
Flow: 10 - 15 L/min
FiO2: ~40%

Device: Venturi Mask
Flow: 2 - 15 L/min
(based on valve)
FiO2: 24 - 60%
(precisely controlled)

Device: Non-Rebreather
Flow: 10 - 15 L/min
FiO2: 80 - 95%

Device: High Flow Nasal Cannula
Flow: up to 60 L/min
FiO2: 21 - 100%

OXYGEN THERAPY

Target SpO2 above 94 %. Oxygen delivered

- Nasal cannula: upto 5L/mt
- Face mask: upto 10-15L/mt
- NRBM mask: upto 15L/mt
- HFNO device: can give upto 60L/mt
- CPAP: though relative contraindication in pregnancy, can be tried if above therapies fail

LABORATORY INVESTIGATION FOR ADMITTED COVID 19- POSITIVE PATIENTS

At Admission	**CBC, RFT, LFT, CRP, RBS, S. electrolytes, ECG, Pulse oximetry**
If clinically Indicated	Portable CXR, D-Dimer, Ferritin, LDH, CPK, procalcitonin, Blood culture, TROP T/I, HRCT Thorax [only in case of worsening}
To repeat Every 48 hours if clinically deteriorating.	CBC, Creatinine, AST/ALT, CRP, LDH, CPK, Ferritin, D Dimer.
For Immunocompromised patients eg Transplant recipients, HIV	Tests to rule out opportunistic infections.

REFERENCE RANGE OF PRO-INFLAMMATORY MARKERS

Marker	Normal value	High risk
CRP	< 5	CRP > 100 mg /L
D dimer	1st trimester :169-1202mcg/l 2nd trimester: 393-3258 mcg/l 3rd trimester: 551-3333 mcg/	
Ferritin	< 60 mcg/L	Ferritin =300mcg/L
LDH	< 400 U/L	LDH > 400 U /L
		#NLR >3.1*ALC < 0.8

Society of fetal Medicine recommendations about Ferritin

The Society for Maternal-Fetal Medicine (SMFM) recommends evaluation of ferritin in individuals with fevers higher than 39 °C despite acetaminophen in an effort to identify secondary hemophagocytic lymphohistiocytosis or cytokine storm syndrome, which may have a fulminant course.

BIOMARKERS

D-dimer: those with significant D-dimer elevation (arbitrarily defined as a 3-4 fold above ULN) be hospitalized even in the absence of other concerning symptoms.

Serum Ferritin: COVID-19 patients with a raised serum ferritin level of >300 □g/l had a 9-fold increase in the chances of death before discharge.

Criterion for admission to ICU

Major criteria

– Need for invasive mechanical ventilation
– Shock with the need for vasopressors

Minor criteria

– Respiratory rate ≥30 bpm
– PaO_2/FiO_2 ratio <250
– Multilobar infiltrates
– Confusion/disorientation
– Uraemia (blood urea nitrogen >20 mg/dL)
– Leukopenia: <4,000 cells/mm^3
– Thrombocytopenia: <100,000 platelets/mm^3
– Hypothermia/central temperature <36°C
– Hypotension in need of aggressive fluid resuscitation

Admission criteria: 1 major criterion or 3 minor criteria. FiO_2, fraction of inspired oxygen; PaO_2, partial pressure of oxygen.

SIGNS OF INFECTION ??

Mild Infection

Presence of local symptoms in the upper respiratory tract (cough, throat sore, rhinorrhea, or anosmia) with or without non- specific symptoms such as fever or myalgia and a CURB score of 0.

Moderate Infection

Mild pneumonia, considered as pneumonia confirmed by chest X-ray, without presenting severity signs (basal SO_2 >90%, no need for Vasopressors or ventilator assistance, and CURB score ≤1). The patient should be admitted to an isolation ward (ideally in a negative Pressure room) with vital signs monitoring and under the consultation of maternal-fetal, anesthesiology, and infectious diseases specialists.

Severe Infection

- Severe Pneumonia. When any of the following criteria are met
- failure of ≥1 organ, basal SO_2 <90%, respiratory rate ≥30 bpm, or need for vasopressors.
- Respiratory Distress.

Suggestive clinical findings (dyspnoea, chest retraction, respiratory effort) or radiological evidence of bilateral infiltrates plus oxygenation deficit (SO_2/fraction of inspired oxygen [FiO_2] ratio ≥315 [if partial pressure of oxygen (PaO_2) is not available] or PaO_2/FiO_2 ratio ≥300).
Mild: PaO_2/FiO_2 ratio 200– 300;
moderate: 100–200;
severe: ≥100.

- Sepsis. The Sepsis-Related Organ Failure Assessment (SOFA) scale can be used to evaluate sepsis severity (consider if score >2).
  Also quick SOFA with two of the three following criteria: Glasgow ≥13, systolic blood pressure ≥ 100 mm Hg, or respiratory rate ≥22 bpm.
- Septic Shock. Arterial hypotension that persists after resuscitation volume and that requires vasopressors to maintain a mean arterial pressure ≥65 mm Hg and lactate ≥2 mmol/L (18 mg/dL) in the absence of hypovolemia.

ROLE OF THRMBOPROPHYLAXIS ?
MODERATE TO SEVERECASES

LMW heparin

All admitted patients in category B2 and C in third trimester are to receive prophylactic Enoxaparin

- 40 mg sc od if between 50-90kg
- 60 mg sc od if between 90-130kg
- LMWH has to be stopped 12 hours prior to delivery/ C section 24 hours if taking therapeutic doses
- Therapeutic dose of enoxaparin may be needed in category C severely ill patients and those with very high d-dimer values.

Thrombocytopenia may be associated with severe Covid 19 infection.

- Lowdose aspirin at 150 mg/day HS can be considered a viable option for 2-3 weeks for woman not able to take heparin.
- VTE scoring must be done and duration of thromboprophylaxis to be modified accordingly. hydration and ambulation are to be ensured.

- If women are admitted with confirmed COVID 19 infection within 6 weeks post-partum, thromboprophylaxis should be offered for the duration of hospitalization and continued atleast 10 days after discharge.
- For those with significant comorbidity, duration of thromboprophylaxis may be extended to 6 weeks post-partum
- Low dose aspirin at 150 mg/day HS can be considered a viable option for 2-3 weeks.

REDFLAG

- Thrombocytopenia is associated with severe COVID-19. For women with thrombocytopenia (platelets <50,000) stop thromboprophylaxis
- Consider using mechanical aids (such as intermittent calf compressors) if thromboprophylaxis is paused secondary to thrombocytopenia

ROLE OF STEROIDS

WHEN NEEDED FOR OBSTETRICS INDICATION

- Start with Inj Dexamethasone 6 mg 12th hourly for 4 doses, followed by Intravenous Methyl prednisolone 0.5-1 mg/kg or 40 mg OD or oral
  Prednisolone 40 mg OD for 10 days or hydrocortisone 80 mg twice until discharge whichever is earlier.
- MDI Budesonide 800mcg twice a day started when the symptoms (fever and/or cough) are persistent beyond 5 days of disease on set.

Parenteral/oral steroids can be started when

- Moderate to severer rise in RR or a fall in spO2 even without pneumonia
- 3% desaturation with 6-minute walk test
- Bronchopneumonia and
- Marked rise in proinflammatory markers with symptoms.

COVID-19 therapies

The efficacy of antiviral and biologic agents for COVID-19 in pregnancy remains unclear, and no clinical trials in pregnancy have been conducted

- The decision to use currently available therapeutic agents approved under the US Food and Drug Administration's Emergency Use Authorization (EUA) is made in consultation with MFM and infectious disease experts and in accordance with institutional protocols following a discussion of potential benefits and risks with the patients.

Antibiotics

- Azithromycin, Inj Ceftriaxone or other higher antibiotics is considered with increasing counts or CRP.

Remdesivir

- May be indicated in Category C with bronchopneumonia not responding to steroids and oxygen.
- Its safety in pregnancy though not yet established, it may be offered on a compassionate basis with written informed consent.

It needs to be started within 10 days of onset of symptom. Recommended dose is 200mg IV on day1, followed by 100 mg daily IV x 4days

- RFT and LFT must be normal, and it is preferable to do a creatinine clearance.
- Ivermectin and Favipiravir are contraindicated in pregnancy.

REMDESIVIR

Considerations in Pregnancy:-

- Pregnant patients were excluded from the clinical trials that evaluated the safety and efficacy of remdesivir for the treatment of COVID-19, but preliminary reports of remdesivir use in pregnant patients from the remdesivir compassionate use program are reassuring.
- Among 86 pregnant and postpartum hospitalized patients with severe COVID-19 who received compassionate use remdesivir, the therapy was well tolerated, with a low rate of serious adverse events.
- Remdesivir should not be withheld from pregnant patients if it is otherwise indicated.

Tocilizumab

- Use in pregnant patients must be made on a case-by case-basis to be decided by the multi disciplinary team

Convalescent Plasma

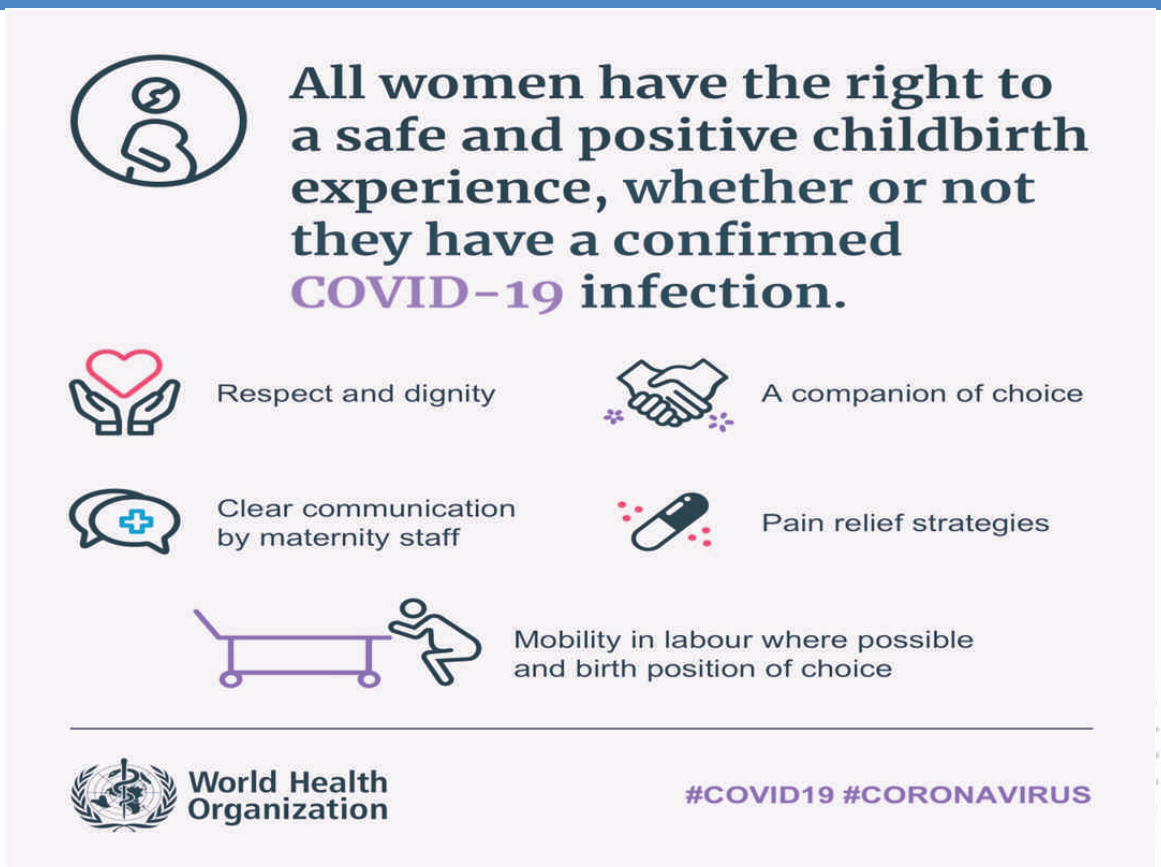
- Its use can be decided by multidisciplinary team in moderate to severe cases

Should we take consent for Remdesivir?
YES we should take consent.

Is vertical transmission or neonatal infection

Very Rare cases reported 1-2% and all neonates recovered

Right to Safe and Positive



Category C

- These patients require multi-disciplinary care and must therefore be admitted in Covid designated hospitals.

- A thorough history, especially with regard to covid symptomatology, extensive review of records, and a well done general and Obstetric examination is a must.

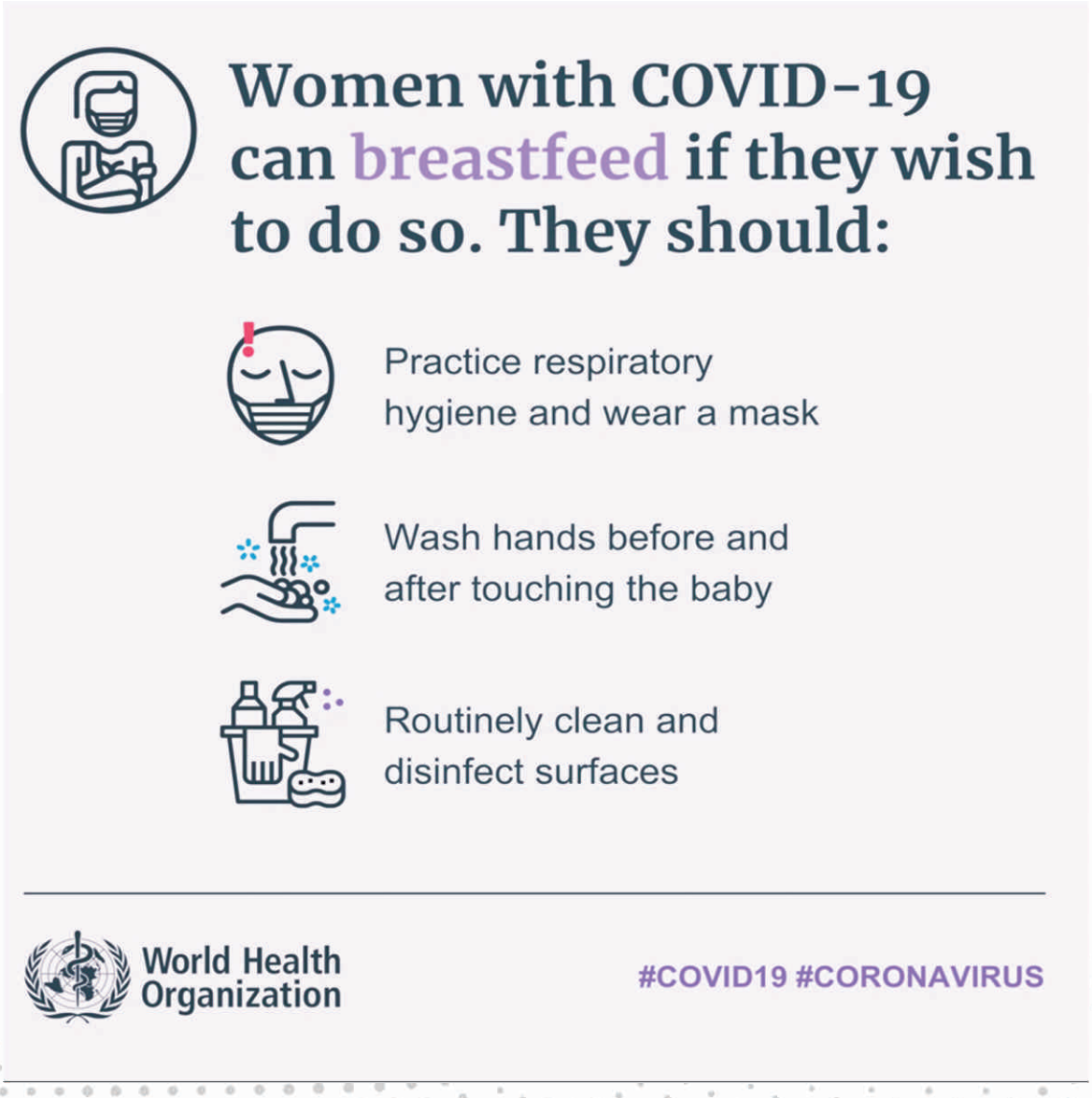
(Rule out other obstetrical causes)

On pronepositioning

If pregnancy is less than 28 weeks baby is not salvageable and patient needs proning for her covid 19 severity, patients should be given prone position

- If pregnancy is beyond 30 weeks and we need mechanical ventilation and proning we should consider LSCS, though keeping in mind in creasing risk of inflammation.

Pthas Delivered and is stable,
Counseling regarding lactation??



LAST BUT CERTAINLY NOT THE LEAST

Contraception

Home isolation advice

Vaccination advice

Post-Partum Care

Breast feeding can be permitted. Mother to ensure respiratory & hand hygiene.

- Encourage oral hydration, ambulation of patient.
- All post LSCS patients in covid ward should be given LMWH 40mg od x 10days.
- Patients should be taught to take LMWH by self after discharge.

Antibiotic prophylaxis guideline is to follow institution protocol

FIGO Statement

2 March 2021

FIGO International Federation of Gynecology and Obstetrics the Global Voice for Women's Health

COVID-19 Vaccination for Pregnant and Breastfeeding Women

- There are no risks–actual or the or etical–that would out weigh the potential benefits of vaccination for pregnant women. We support offering COVID-19 vaccination to pregnant and breastfeeding women.
- There is not sufficient evidence to recommend the routine use of COVID-19 vaccines for pregnant or breastfeeding women
- Reassuring data come from a statement, released in the USA in February, that 20,000 pregnant women had been vaccinated with no alarming signs reported.

Empower women to make informed choices

- **Following a risk-based approach may put pregnant women at a disadvantage**
- **Vaccine administration in pregnant women**
  - No preference for the use of a particular COVID-19 vaccine, but pregnant women who agree to be vaccinated should be advised to complete their two-dose series (where applicable)with the same vaccine product
  - It is advisable that a COVID-19 vaccine series should be administered without any other vaccine, with a minimum in interval of 14 days before or after administration of any other vaccine.

Women planning their pregnancy can take the COVID-19 vaccine if they choose to do so.

- Routine testing for pregnancy before COVID-19 vaccination is not recommended.
- Women who are trying to become pregnant do not need to postpone pregnancy after receiving a COVID-19 vaccine
- COVID-19 vaccines are believed to poseminimal to no potential risk to the new born through breast milk.

Current Recommendations on COVID Vaccine in Maternity Care in India

At present, he recommendations from the Ministry of Health and Family Welfare, Government of India state that pregnancy is still a contraindication to vaccination.

Based on the sound principle that there is no data available to

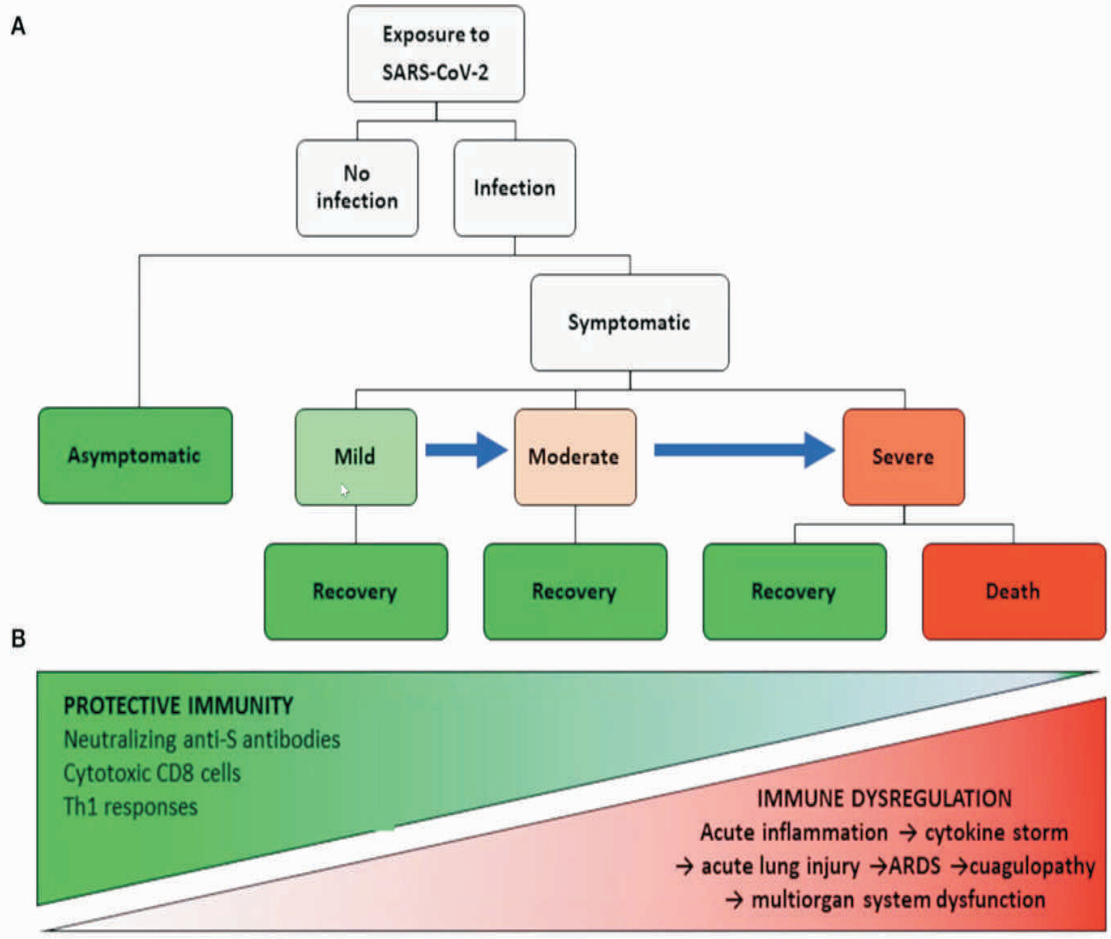


FIGURE 1 | COVID-19 Clinical and immunological spectra. **(A)** Clinical stages of COVID-19. **(B)** Protective immunity and inflammatory spectra.