

PREGNANT WOMEN'S ASPECTS, CONSEQUENCES, PREVENTION, AND MANAGEMENT DURING THE COVID-19 OMICRON WAVE

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ABSTRACT

Background - COVID-19 or coronavirus is an emerging international disease that causes severe illness rate and death to the patients. This virus can also cause severe effects on pregnant women. Pregnant women have potential transmission chances of virus from mother to child, therefore, women need much more attention in this pandemic time. This virus can cause severe effects on women who are suffering from already pre-existing diseases.

Objective- Our research intended to determine the clinical characteristics and consequences of pregnant women who had been infected with the coronavirus, as well as preventive and numerous technologies that may help with coronavirus care in pregnant women.

Methods- Several combined data from review, research, meta-analysis from different source like PubMed, science direct, WHO guidelines, Various guidelines like The Royal college of obstetricians and gynecologists, the royal college of pediatrics and child health and Web of Science are studied.

Result- After reviewing a variety of data from numerous sources, it was discovered that coronavirus can pose a concern to some women and cause life-threatening complications, as well as affect newborns. Additionally, pregnant women with a pre-existing condition have a higher risk of coronavirus infection. Given the acute and chronic placental changes produced by COVID-19, it would be appropriate to check for foetal development restriction." Foetal surveillance, including serial ultrasound exams of women with COVID-19, will be challenging for maternity institutions to provide.

Conclusion- Pregnant women should get vaccinated and take precautions to avoid infection, such as maintaining social distance, using telephonic conversation, and not leaving the house unless absolutely required.

KEYWORDS

"Corona virus", "Omicron", "Corona-virus Variants", "Physiology of COVID-19 in pregnant women", "Role of Technology in management of pandemic", "Symptoms of coronavirus in pregnant women", "complication of COVID-19 in pregnant women".

INTRODUCTION

COVID-19, or coronavirus, is an emerging international disease that causes severe illness and death to patients. This virus causes an effect on both humans and animals. This virus is causing symptoms like high fever, headache, dry cough, and sometimes diarrhea in some patients. Nowadays, COVID-19 is an emerging international disease [1]. Covid-19 was first reported to the world health organization (WHO) in Wuhan, China in December 2019 [8,9]. On January 30, 2020, the World Health Organization (WHO) declared the novel coronavirus as the sixth international concern of a public health emergency [2,3]. During the first wave of coronavirus, several obstetricians and gynecologists says that if pregnant women were infected with the virus, they did not suffer too much. It was seen during the first wave that if even pregnant women get infected and there is a condition of hospitalization due to severity and mortality, then it is also manageable by taking more precautions to deliver the child. But the second wave was proven too dangerous to everyone. It changed everything. There was considerable speculation in the first wave that the hormone associated with pregnancy would provide some protection against COVID-19. However, in the second wave, several women became critically ill and required intensive care, with the infection, in some cases, being fatal. The second wave, which is due to the delta variant, saw a large number of women get the disease and suffer serious difficulties during pregnancy or shortly after birth. As a result, it raises a question about how the health of pregnant women can be protected if the number rises again [4].

Omicron is a recently identified coronavirus variant B 1.1. 529 and was discovered in November 2021 in Southern Africa. This virus was identified when the number of infected people suddenly increased in South Africa and then in other countries. It is designated as a "variant of concern" by the World Health Organization. This variety contains multiple mutations, some of which are troublesome. A preliminary study suggests that this variant has a higher risk of reinfection than other VOCs [5]. The SARS-CoV-2 Virus Evolution Technical Advisory Collection is a group of experts who are not affiliated with the virus. It analyses and tracks SARS-evolution CoV-2's on a regular basis to check if specific mutations or combinations of mutations have emerged in the behavior of the virus. The variety B.1.1.529 was designated as a concern variant, known as Omicron, on the recommendation of WHO's Technical Advisory Group on Virus Evolution (TAG-VE).As shown in **figure 1**, WHO has classified the following variants of concern (VOC) [6]. In 2021, the global number of cases of this virus increased dramatically, peaking in January and February 2022. This shows that this virus poses a special concern to some people, such as pregnant women, elderly immunosuppressed people, and those with certain pre-existing morbidities. Pregnant women in their third trimester have also been found to be at an elevated risk [7,8]. Across the world, everyone is facing a crisis due to the coronavirus and keeps fighting against the most powerful threat of the 21st century. Throughout the world, 3 notable waves of this coronavirus infection have been witnessed, and now we are in preparation to fight the upcoming waves. Patients infected with coronavirus continue to arrive; data on the number of coronavirus patients is shown in

figure 2 [9].COVID-19 variant characteristics are changing time-to-time. Therefore, it is important to study its effects on pregnancy and its outcomes. It has been seen that the new variant of SARs COV2 has increased morbidity in pregnant women who have not been vaccinated.

So, in this study, we will look at the many effects of coronavirus during pregnancy, as well as treatment and prevention strategies that can help control the spread of illness and deal with problems it causes. We will pay special attention to how technology is used to prevent coronavirus.

Morphology and Pathophysiology and Transmission of Coronavirus in Pregnant Women.

Coronavirus is a member of the coronavirinae subfamily of the order Nidovirales in the coronaviridae family. Coronavirus has enveloped, non-segmented, single-stranded, positive-strand RNA viruses characterized by some spherical morphological features with surface spike projections as shown in **figure 3**. Coronavirus is a Latin term which means crown or like structure which has particles like a crown- fringe when seen under electron microscopy. This crown-fringe is referred to as "spike glycoprotein." Human coronaviruses are classified into two categories: Alpha coronavirus and Beta coronavirus [10-14]. The common human coronaviruses which cause the common cold are 229E (α), NL63 (α), OC43 (β) and HKU1 (β). The other three human coronaviruses which are causing severe and chronic effects are MERS-COV, which causes Middle East respiratory syndrome (MERS), SARS-COV, which causes acute respiratory syndrome (SARS), and SARS-COV-2, which causes COVID-19. The genome of this coronavirus was quickly sequenced and is genetically similar to severe acute respiratory syndrome [15–18]. Coronavirus is a zoonotic virus, meaning it can affect both people and animals. COVID-19 is a droplet infection induced by respiratory droplets, a contact infection (person-to-person), and this virus may also live on non-living surfaces, making it critical to clean the touched surface on a regular basis [19,20]. There are seven coronaviruses that cause illness, with two of them being deadly, SARs-CoV-1 and the Middle East Coronavirus Respiratory Syndrome (MERS-CoV). These viruses feature receptor-binding domains that are similar to those of COVID-19, and they share the same pathogenesis [21,22]. This virus enters the body by the nasal channel and promotes infection in pulmonary cells via SARs-COV receptor angiotensin-converting enzyme 2 (ACE2) and S protein priming by transmembrane serine protease 2 (TMPRSS2) [23,24]. As illustrated in **figure 4** [25], coronavirus infection is followed by viral replication and release of the virus, which causes the host cell to pyroptose.

Because SARs, as an ACE2 receptor, are widely expressed in the placenta and share a receptor binding domain structure with SARs-COV and SARs-COV2, there is a possibility of vertical transmission [26,27]. It was recently discovered that a new-born from a COVID-19-infected mother tested positive shortly after delivery, which could indicate vertical transmission. However, this fact is still unknown. There is no clinical data on perinatal outcomes during the first trimester [28-33]. Early investigations found no evidence of

vertical coronavirus transmission from mother to child in late pregnancy, although utero transmission was subsequently discovered. The presence of IgM antibodies in cord blood in neonates indicates vertical transmission [34]. In one case, an anti-SARs IgM antibody was found 2 hours after birth. Only a few investigations have shown evidence of a virus in the placenta. Vertical transmission cannot be considered if a virus is present in the placenta. The placenta serves as an immune barrier, preventing viral transmission from the maternal to the foetal side [35-37]. Understanding the pathophysiology and mechanism of coronavirus is crucial to understanding the COVID-19 phenotype.

Symptoms of the different variant of corona virus in pregnant women

The symptoms of some viruses do not appear right away. They usually appear 14 days after being exposed. Shortness of breath, cough, myalgia, fever, and severe pneumonia are all symptoms of the coronavirus. Symptoms of the coronavirus in pregnant women vary over the first, second, and third trimesters, as illustrated in **figure 5**. Patients with pre-existing conditions such as diabetes and lung disease, as well as the elderly, are more susceptible to this virus [38–40].

Omicron, SARS MERS

The omicron variant of the coronavirus, which was discovered to be the most dangerous to everyone, especially pregnant women, was a particularly stressful situation during the second wave. The coronavirus variant omicron is the most dangerous. Public health professionals have urgently encouraged pregnant women to take extra precautions and avoid getting COVID-19 throughout the pandemic. Omicron was first discovered as a variety of concerns by the World Health Organization (WHO) in late November, before it quickly spread around the world. Since then, health officials have been tracking various subvariants of the Omicron family, including BA.1 and BA.2. In December, January, and February, BA.1 accounted for the majority of COVID cases. However, the subvariant BA.2 has taken over as the dominant strain this spring. BA.2 has been proven in certain studies to be more transmissible than BA.1, but the difference is smaller than the difference between the Delta variation and BA.1 [41].

SARS is a severe acute respiratory syndrome, while MERS is a Middle East Respiratory Syndrome. These are respiratory diseases caused by SARS-CoV and MERS-CoV. The first case of SARS was seen in China's Guangdong, and this virus resulted in more than 8000 cases and 700 deaths throughout the world in over 30 countries. MERS was first reported in Saudi Arabia in 2012, and this virus resulted in more than 2500 cases and more than 860 deaths. SARS symptoms include nausea, chills, headache, malaise, myalgia, and sometimes diarrhea, while MERS symptoms include extreme respiratory illness, including fatigue, cough, shortness of breath, and sometimes diarrhea too in some patients. SARs are transmitted by contact like person-to-person touch or via droplets when an infected person coughs or sneezes, which is produced by the respiratory tract mucous membrane [42-44]. There are also some records that are found in which there are possibilities of fecal-oral transmission and fomite airborne transmission due to

inhalation of a small particle of aerosol. The incubation time for this virus is 2-14 days. Transmission tended to occur more frequently during the second week of illness. Fetal growth restriction occurred in 11.7% of pregnant women, and pre-eclampsia occurred in 16.2%. Coronavirus pregnancyinfection has various prenatal and perinatal outcomes for pregnant women. It causes miscarriage, premature membrane rupture, and preterm birth [45].

Several Guidelines and Major concern of variants cause more severe disease in pregnant women

Pregnancy is an indicator of viral infection, which increases the risk of adverse obstetrical and neonatal outcomes [46].As coronavirus is continuing to spread throughout the world, the potential transmission (mother to fetus), prenatal management, and fetal safety are major concerns. Pregnant women with pre-existing diseases like diabetes (hyperglycemia), blood pressure (hypertension), and preeclampsia in this pandemic time have a greater chance of infection by coronavirus. Recently, the Ebola and SARS pandemics have had the worst effect on pregnant women. During pregnancy, this results in increased oxygen demand and lower functional residual capacity [47,48]. As a result, the coronavirus may pose a greater danger to pregnant women than to non-pregnant women. Pregnancy suppresses a woman's immune system, and a weaker immune system renders women more susceptible to illness [49-52]. Because women's physiological and immunological functions change during pregnancy, resulting in lower residual volume volumes, diaphragm elevation, and decreased cell immunity, all of these factors lead to an increased risk of infection [53-55]. For COVID-19-positive pregnant women, vertical transmission, miscarriage, deformity, foetal development damage, and/or stillbirth are two key concerns. There are only a few exceptions that require hospitalization in an intensive care unit, and some needs for artificial breathing have been reported [56-58]. It is recommended that pregnant women take extra measures against COVID-19. The International Federation of Gynecology and Obstetrics (FIGO) recommends replacing conventional prenatal care with video or telephone consultations wherever possible to avoid transmission of infection during a pandemic [59-61].

The FIGO recommendations outline how to treat women throughout their pregnancy, including ambulatory prenatal care in outpatient clinics, obstetrical triage, intrapartum, and postpartum care. On March 21, 2020, the Royal College of Obstetricians and Gynecologists (RCOG), the Royal College of Pediatrics, and the Royal College of Child Health will release a guideline on the coronavirus and its effects on pregnant women. According to RCOG (2020), there is no current evidence that the virus can cause miscarriage or that it can be passed on to the baby during pregnancy [62,63]. According to several studies, respiratory virus infections during pregnancy cause issues including low birth weight and premature birth. High fevers that develop early in pregnancy might sometimes raise the risk of some birth abnormalities. Intrauterine transmission of these viral infections to the baby poses a concern for pregnancy [64,65]. Although there is no evidence to support this, coronavirus has an immunological effect on pregnant women

[66]. Pregnant women's immune systems allow the semi-allogenic baby to develop, which leads to a change in immune response in pregnant patients. In general, pregnant women maintain sufficient immunity and become tolerant of fetoplacental semi-allografts. Increased induction of interferon (IFN)-beta plays an important role in protecting the fetus against viral infection. Even if they do not infiltrate embryonic tissue, they may harm foetal life. However, there is no clinical evidence that coronavirus infection during pregnancy causes negative consequences in pregnant women. [67-69]. Several complications when pregnant women are exposed to coronavirus are shown in **figure 6**.

Clinical Management Of coronavirus among pregnant women

The severity of the infection determines how omicron and other variants are treated. If there is a mild infection, then women are advised to stay at home in isolation, during which they should keep their bodies hydrated and check their temperature at least thrice a day. If the temperature rises, take paracetamol 500-600 mg and some zinc and vitamin supplements. If a woman is susceptible or infected, she should postpone all her routine pregnancy visits, tests, and screening ultrasound until the end of the isolation period. One negative PCR test is a must after completing the incubation period. In moderate to severe cases, hospital admission is required in which monitoring of vital signs is the first step, which includes blood pressure, respiratory rate, SO₂ and heart rate, and intensive care. (Shown in figure 7) [70].

When compared to non-pregnant adults, pregnant women are at a higher risk of serious sickness from COVID-19. This might include illnesses that need hospitalization, mechanical ventilation, or death. There is minimal information on the safety of the COVID-19 vaccine for pregnant women. There are various studies received from Moderna, Pfizer-BioNTech, or Johnson & Johnson's for the COVID-19 vaccine on animal trials showing no safety concerns [71]. Currently, the anti-viral drug is also widely used in the treatment of coronavirus. These anti-virals include Lopinavir, Ritonavir, Favipiravir, Remdesivir, Hydroxychloroquine, Ciclesonide, and Tocilizumab [72,73]. Possible therapeutics for COVID-19 during pregnancy are shown in table no. 1.

Remdesivir is a wide-ranging antiviral nucleotide prodrug that inhibits SARS-CoV-2 replication in vitro and MERS-CoV replication in nonhuman primates [74], and it is safe to use during pregnancy [74].

Chloroquine phosphate is an antimalarial quinolone medication with broad-spectrum antiviral and immunomodulatory properties. It stops coronavirus infections in cell culture by raising the endosomal pH, which is needed for cells to fuse, and by stopping SARS-CoV cell receptors from becoming sugary [75].

Ribavirin is an antiviral guanosine analogue that targets coronaviruses. This medicine has been proven to have a high risk of serious side effects in pregnant women, including miscarriage and limb abnormalities, so it should be avoided, especially during the first trimester [76].

Favipiravir is a modified pyrazine analogue that works as a viral RNA polymerase inhibitor. This medication is used to treat new strains of influenza. Based on what we know about animal reproduction, this medicine shouldn't be used during pregnancy because it can cause birth defects [77].

Ciclesonide is a kind of inhaled steroid that is used to treat bronchial asthma and also has anti-inflammatory properties.

Tocilizumab is a human IL-6 receptor-targeting monoclonal antibody that has been utilised to treat rheumatoid arthritis and other collagen-related diseases. This drug has been demonstrated to be effective against COVID-19 in China.

COVID-19 Prevention: Pregnant Women Protect Their-selves from the Virus

There is less information on how to handle coronavirus in pregnant women, although they should all have had the vaccine. Coronavirus infects humans either directly (via contact with an infected person) or indirectly (by touching objects exposed by an infected person). During this epidemic, pregnant women must be extremely vigilant and cautious. They should closely adhere to preventative measures such as good handwashing, avoiding outside activities unless absolutely necessary, and avoiding crowded locations and public gatherings. To avoid droplet infections, they should wear a suitable mask. Women must wash their hands after using the restroom and before eating, as well as sanitize their surroundings, such as tables, doorknobs, ATMs, and keys. They should avoid foreign meals and exercise regularly. Women with a travel history to suspicious locations with COVID-19 symptoms should be isolated for at least 14 days. In pregnant women, pneumonia may be more severe. Because the uterus is larger, it raises the diaphragm and pushes the lungs upward, preventing ventilation and making the lungs more prone to congestion. or infection. So, women who are pregnant need to be careful to avoid getting sick as much as possible [78–80].

They should take their temperature on a daily basis and notify their doctor if their fever rises. They are not to attend hospitals or medical institutes unless there is an emergency. Women should prefer e-communication via phone or email for online treatment, medications, and proper guidance; this is the best way to protect them. Various guidelines on this infectious illness have also been issued [81]. Figure 8 depicts the general precautions that must be taken. COVID-19 pregnant women should be segregated for adequate treatment and then transferred to a hospital with suitable health care resources and professionally educated physicians to provide excellent care [82,83]. During this pandemic, pregnant women at various stages of pregnancy can be managed and cared for by taking precautions during their prenatal, intrapartum, and labor stages as shown in figure 9 and figure 10.

Technology's Role in the Management of Coronavirus in Pregnant Women

Several technologies are useful in managing the COVID-19 epidemic during a pandemic. Figures 11 and 12 demonstrate technologies such as the Internet of Things (IOT), remote patient monitoring, and the Internet of Medical Things (IOMT), among others. These technologies form a network of machines and gadgets that can communicate effectively with one another. Women are unable to travel when pregnant, and attending the hospital may be hazardous to their health. The absence of isolation wards and appropriate medical gadgets has pushed the medical profession to advise patients with mild or suspected symptoms to stay at home. As a result, numerous obstetricians and gynecologists advise pregnant women to seek internet guidance and avoid leaving the house unless absolutely necessary [84].

Discussion and Conclusion

In this brief review article considering the detailed coronavirus effect and its all-variants' effects in pregnant women, we aimed to highlight and conclude the current patient record affected by coronavirus, its morphology in general, and the pathophysiology of coronavirus transmission in pregnant women, as well as the main drugs and some prevention that provided the best results until now. Vaccination is a helpful tool in the struggle against COVID-19 during this epidemic. Based on the study, it was found that viral transmission in pregnant women mostly takes place during the intrauterine pregnancy, during birth, and in breastfeeding throughout the postpartum phase [85]. There is currently no indication that COVID-19 infection in the mother increases the risk of preterm delivery, and COVID-19 infection in pregnancy is less severe than other coronavirus illnesses such as SARS or MERS in terms of maternal conditions [86]. A decline in maternal health can result in an emergency delivery in approximately 45 percent of women. In this post, we explored various drug therapies, COVID-19 management, and COVID-19 prevention. Based on a thorough assessment, we selected several technologies that have been shown to be the most successful during this pandemic. Due to the absence of clear data on the safety and effectiveness of current medications for this group, clinicians should weigh all of the risks and advantages specific to each patient when choosing a treatment for a patient infected with coronavirus during pregnancy or nursing. Despite the need for further evidence on the safety and efficacy of SARS-CoV-2 vaccinations, prevention remains the best option given the absence of established therapeutic techniques for COVID-19 infection in pregnant women [87]. Precaution and preventative measures are strongly advised for pregnant women since infection can only be avoided via prevention. Women should stay away from other people, try to clean the floor and everything around them, stay out of public places if they can, wear masks, and wash their hands often to stay healthy.

According to the research, pregnant women with coronavirus infection show symptoms that are comparable to those of other people. The impact of coronavirus on pregnant mothers and their newborns is poorly understood. They all said, "Most women will have moderate or asymptomatic illness," after analysing the available data. "Some will have

noticed elevated rates of ICU hospitalization and the requirement for mechanical ventilation in pregnant women." Given the acute and chronic placental alterations caused by COVID-19, screening for foetal growth limitation would be prudent. It will be difficult for maternity facilities to provide foetal monitoring, including serial ultrasound examinations of women with COVID-19. There is limited data on coronavirus physiology in pregnant women. Breastfeeding is prohibited for newborns whose mothers have proven or suspected 2019-n-COV, according to Chinese regulations. Pregnancy and seclusion of pregnant women in this lockdown situation may raise the risk of prenatal and postnatal anxiety, stress, and family abuse. As a result, pregnant women may need mental health assistance and treatment. The research on this virus, particularly for pregnant women, newborns, and lactating mothers, is undeniably expanding and global. Instructions are updated on a regular basis.

Abbreviations

WHO	World Health Organization
VOCs	Variant of Concern
TAG-VE	Technical Advisory Group of Virus Evolution
RNA	Ribonucleic Acid
MERS	Middle East Respiratory Syndrome
SARS	Severe Acute Respiratory Syndrome
MERS-COV	Middle East Respiratory Syndrome Coronavirus
SARS-COV	Severe Acute Respiratory Syndrome Coronavirus
ACE2	Angiotensin Converting Enzyme-2
TMPRSS2	Transmembrane Serine Protease2
ICU	Intensive Care Unit
FIGO	The International Federation of Gynecology and Obstetricians.
RCOG	The Royal College of Obstetricians and Gynaecologists.
IFN	Interferons
PPE	Personal Protective Equipment
RT-PCR	Reverse Transcription Polymerase Chain Reaction.
LAMP	Loop Mediated Isothermal Amplification
DNA	Deoxyribonucleic Acid
IOT	Internet of Things
IOMT	Internet of Medical Things

CONFLICT OF INTREST

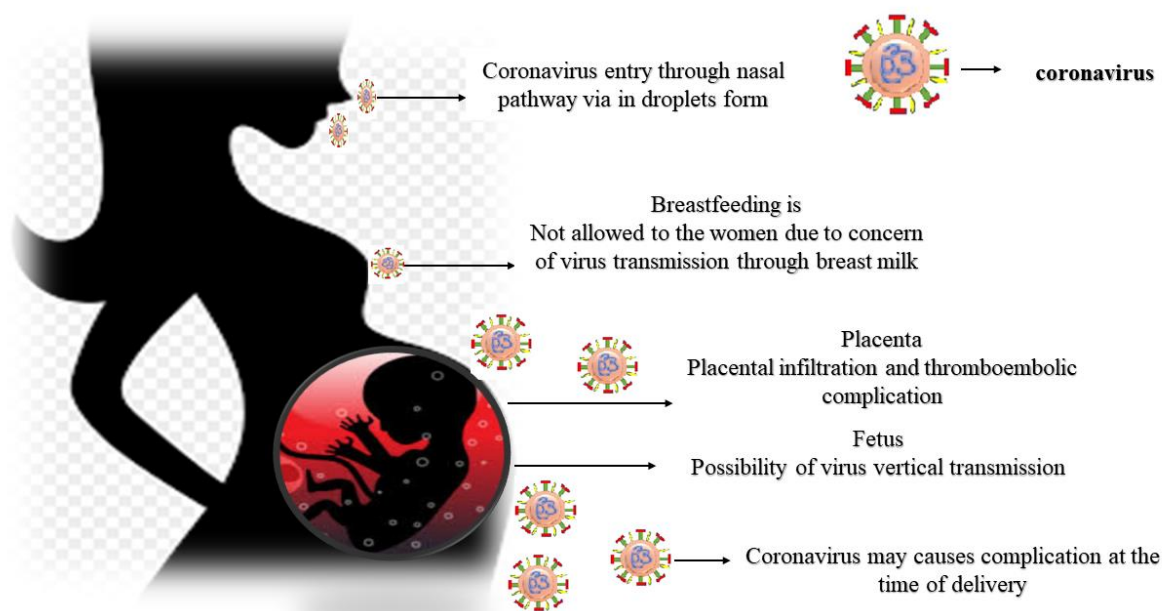
The author expresses no conflict of interest.

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Figures

Graphical abstract



Main Text Figures

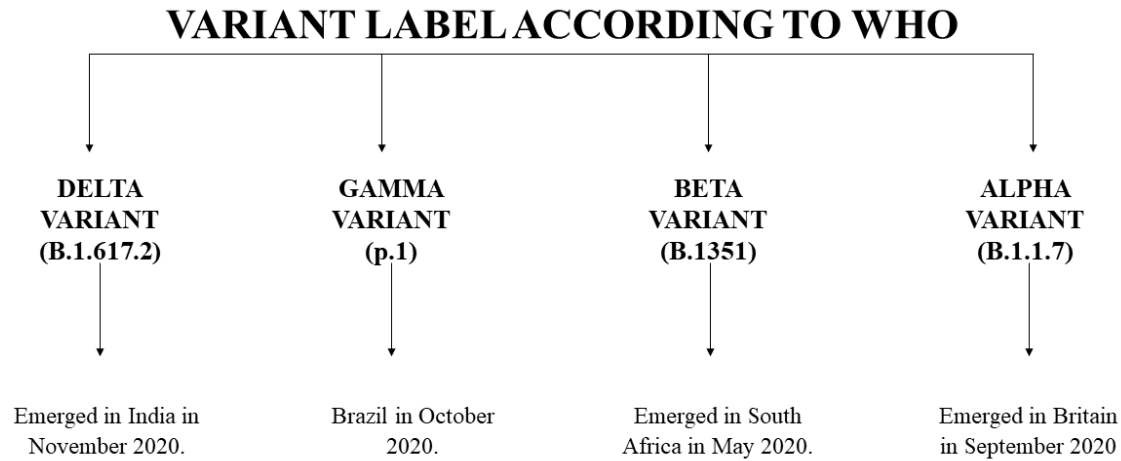


Figure. (1) Different Variant of Concern Classified by WHO.

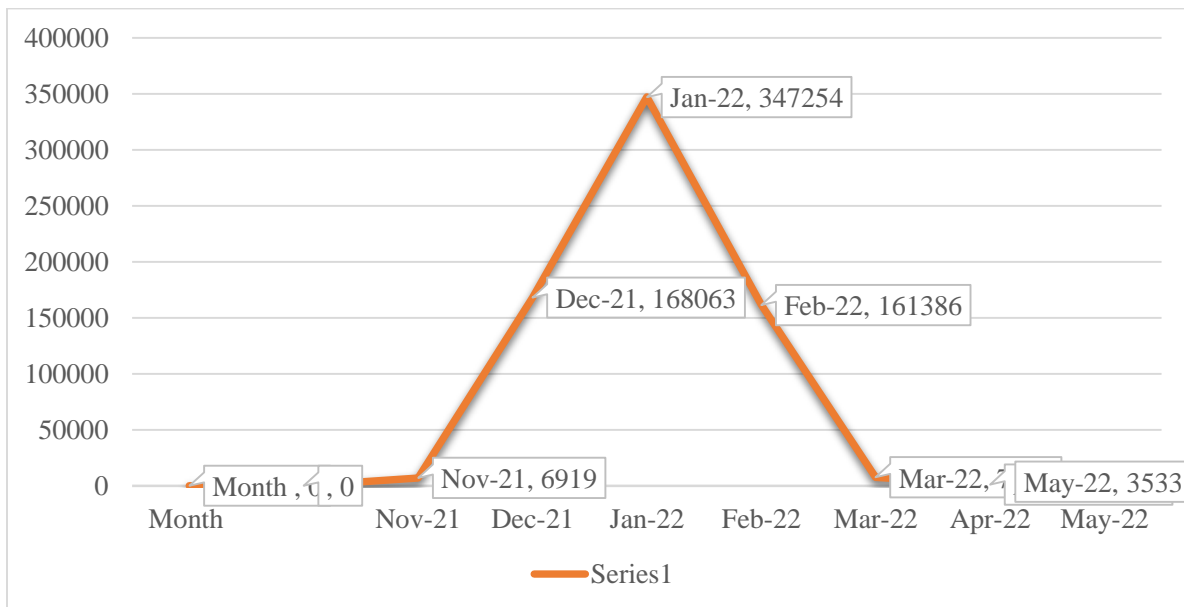


Figure. (2) WHO database of infected patients of coronavirus in past months to till month.

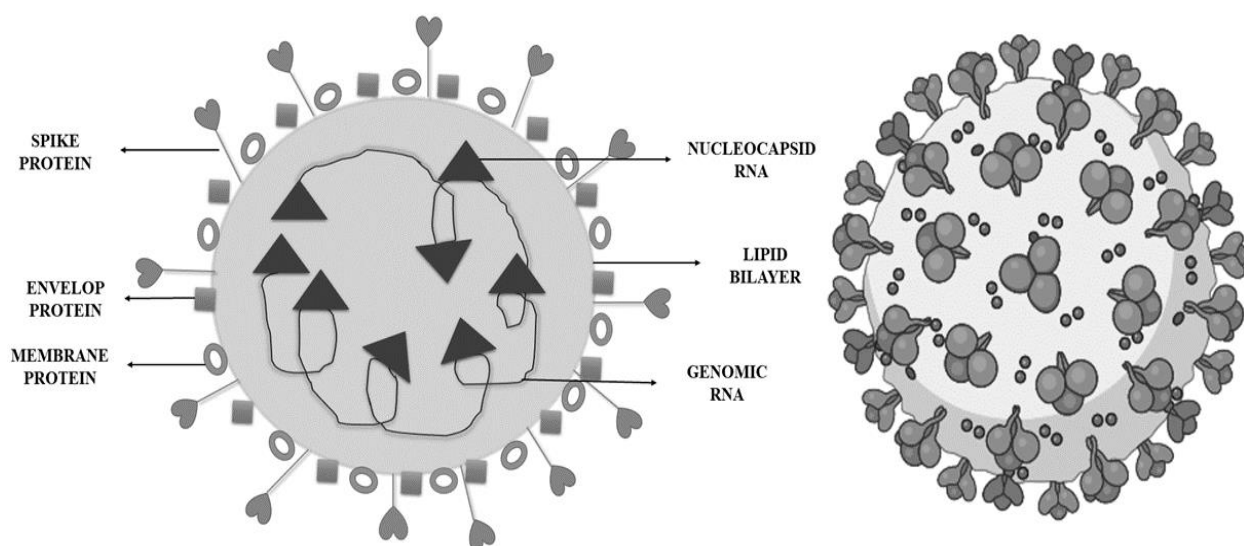


Figure. (3) Structure of corona-virus

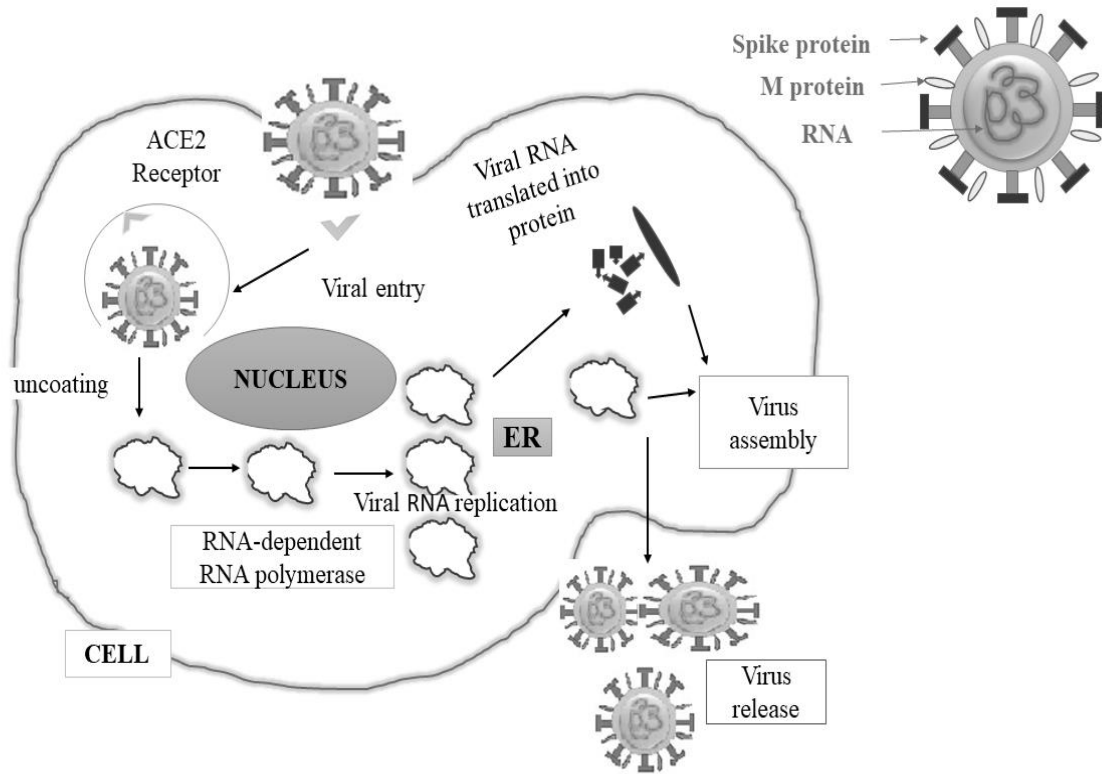


Figure. (4) In pregnant women, the coronavirus attaches to the cellular receptor angiotensin-converting enzyme2 (ACE2). The viral genome reaches the cytoplasm, where it is followed by the uncoating of RNA, which allows it to translocate into the endoplasmic reticulum. The viral genome is replicated in the presence of RNA-dependent RNA polymerase.

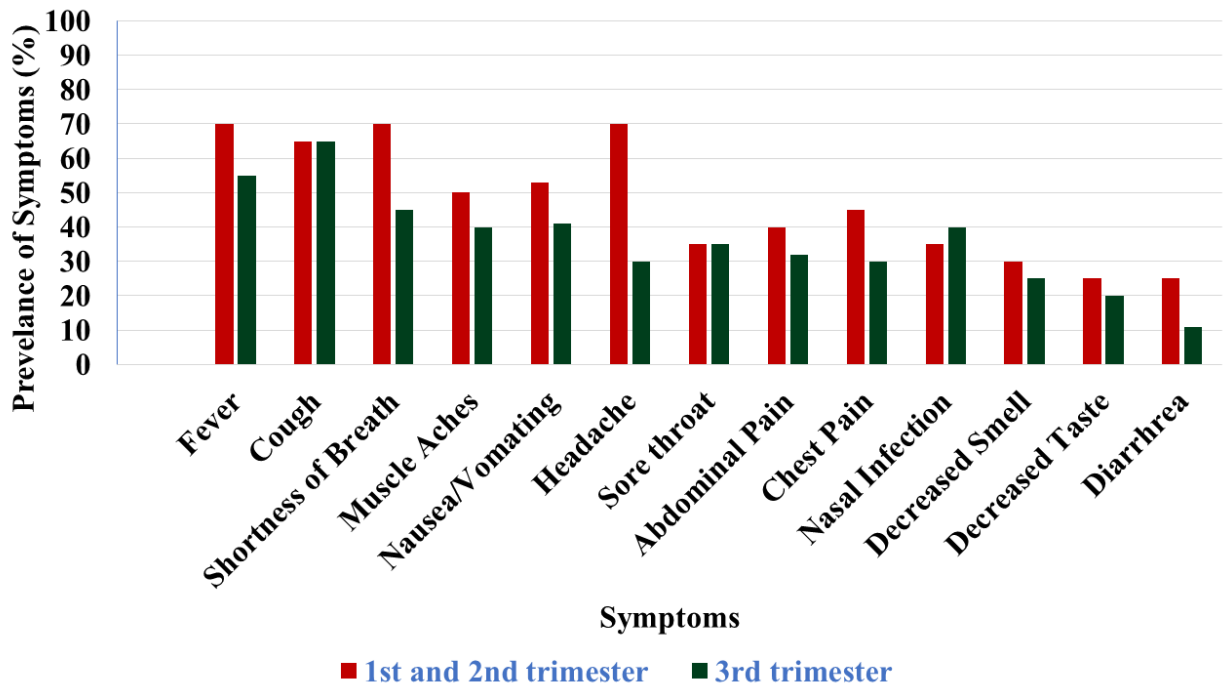


Figure. (5) The incubation period for this novel coronavirus is recorded approximately 7-14 days. During these days coronavirus shows some clinical features that may include Fever, Lower airway infection, Upper respiratory tract problems like Sneezing, Sore-throat, and Rhinorrhea and sometimes diarrhea also occurs to patients.



Figure. (6) Several Complication of Pregnant Women Faced during COVID-19 Pandemic

Initial Management	Clinical Deterioration	Discharge
<ul style="list-style-type: none"> ○ Oxygen level should keep sats>94%. ○ Thrombophylaxis. ○ Corticosteroids. ○ Dexamethasone is used for fetal lung maturation. ○ Check anti-spike SARs-COV-2 antibodies. 	<ul style="list-style-type: none"> ○ Increased oxygen requirement. ○ Discuss with obstetric physician at regional maternal medicine center. ○ Give tocilizumab. If continued clinical deterioration- <ul style="list-style-type: none"> ○ Re-consider delivery ○ Proning in discussion with intensive care team. ○ Early discussion with an ECMO center. 	<ul style="list-style-type: none"> ○ Thromboprophylaxis for at least 10 days. ○ Safety net/telephone follow up. ○ Encourage COVID19 vaccination: can be given 28 days following recovery. ○ Advise: if given tocilizumab/sarilumab, be aware of an increased risk of infection without typical signs for several months.



Figure. (7)



Figure. (8)

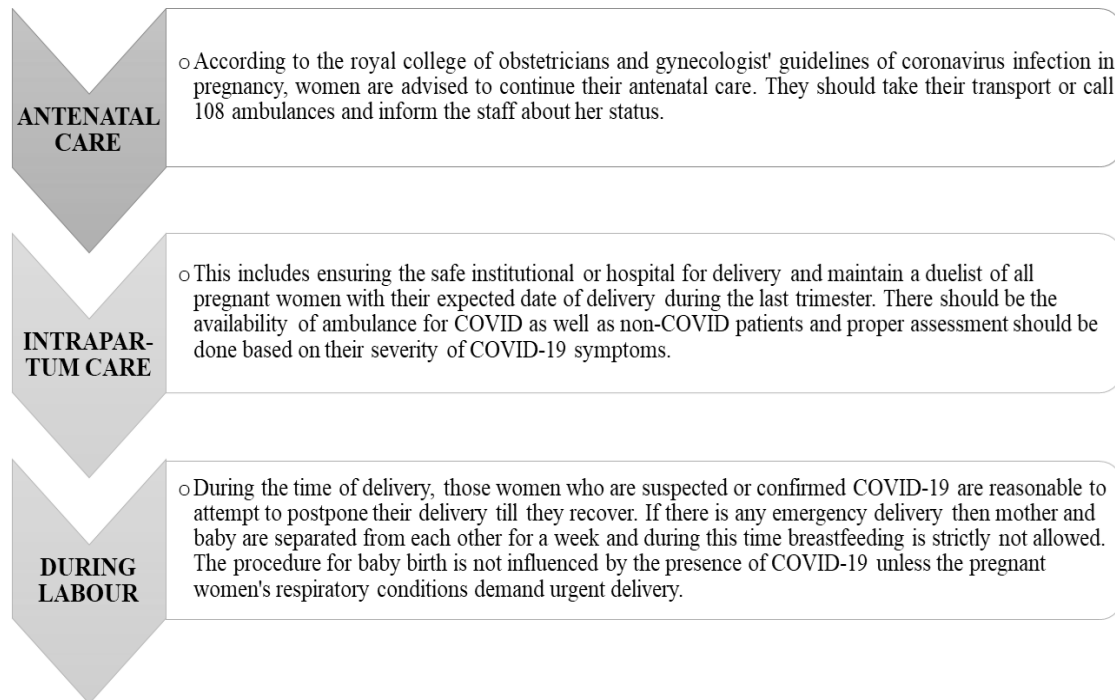


Figure. (9)

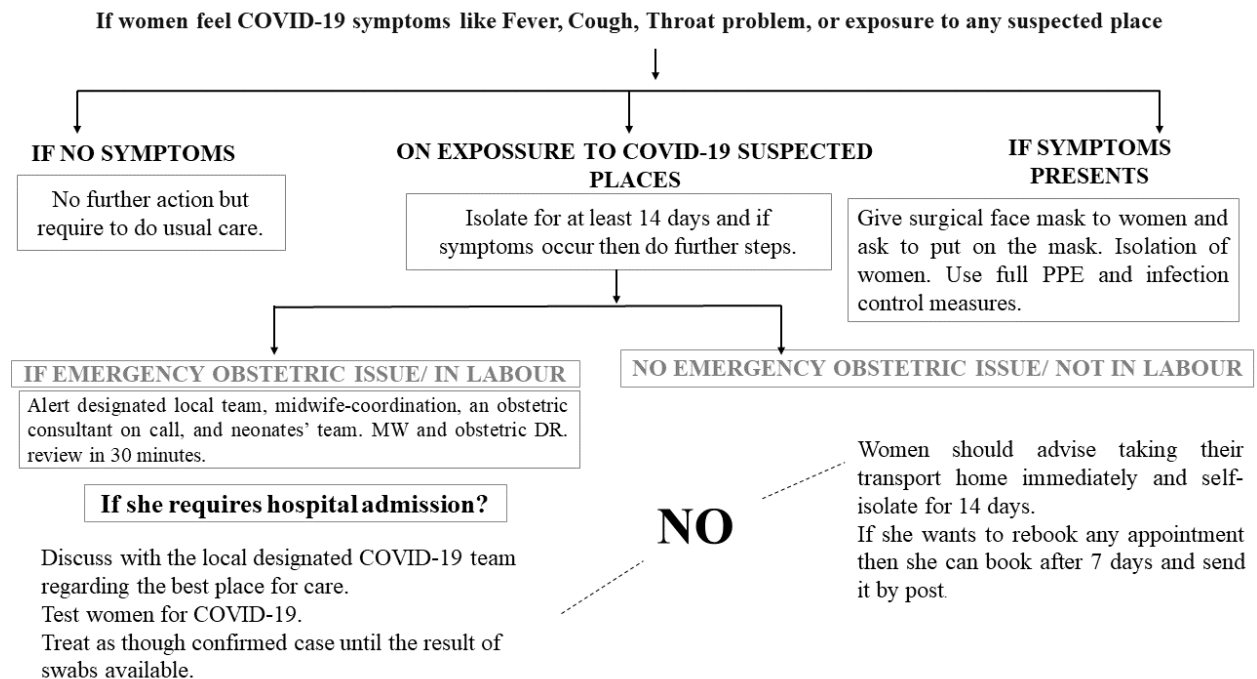


Figure. (10)

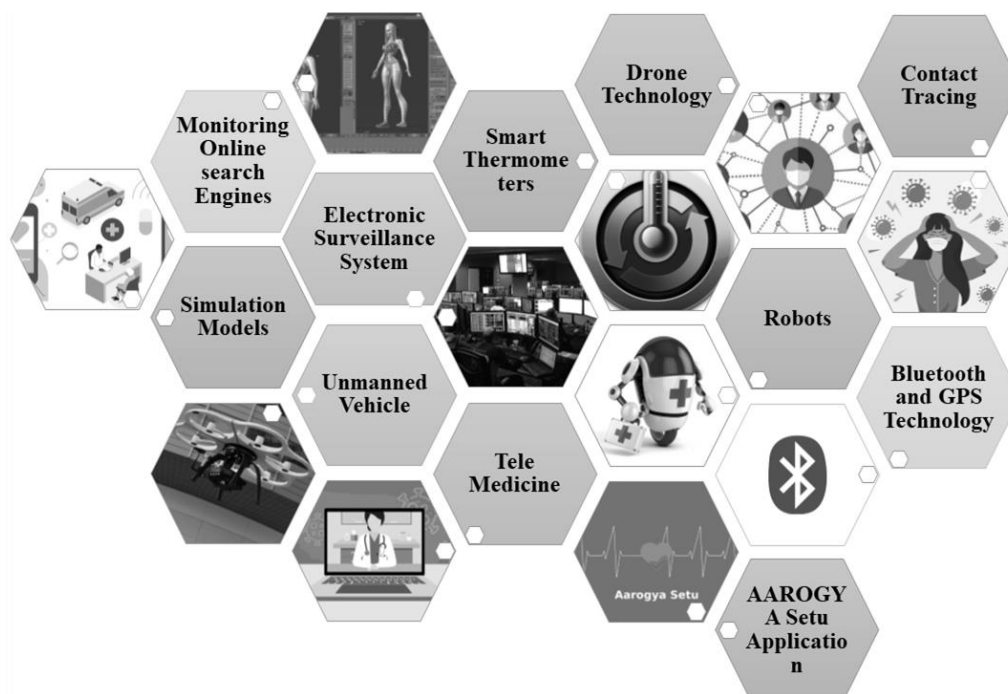


Figure. (11)

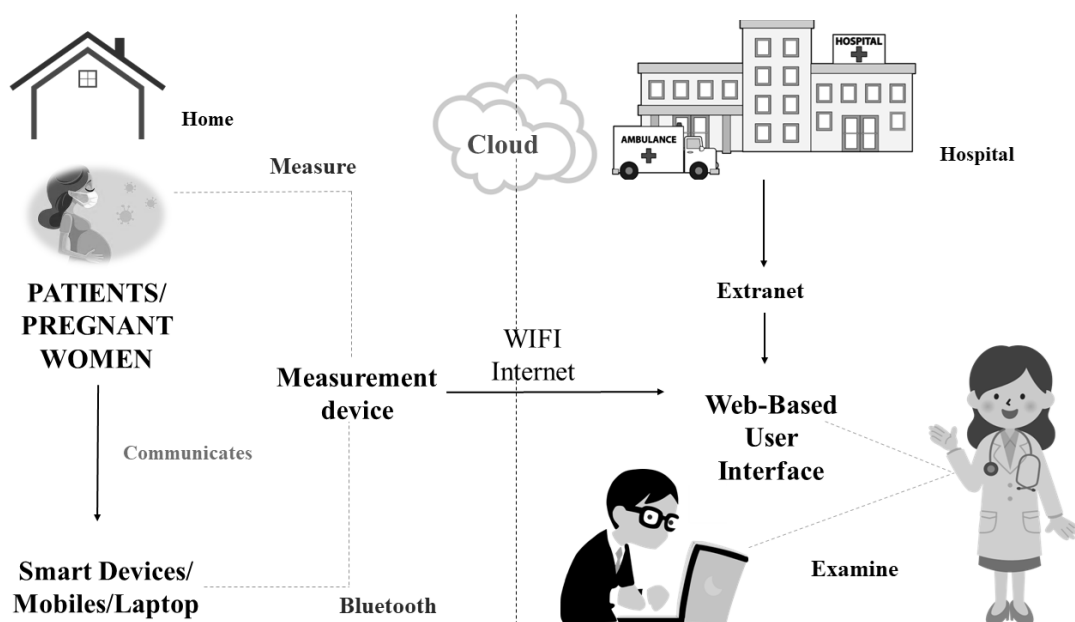


Figure. (12)

Tables:

Table no.1 currently used therapeutics treatment for the treatment of coronavirus in pregnant women

DRUGS	MODE OF ACTION	ROUTE OF ADMINISTRATION	INDICATION FOR PREGNANT PATIENTS
Corticosteroids	Induce anti-inflammatory as well as immunosuppression effects.	Inhaled	Positive
4-Aminoquinoline	Block SA (Sialic acid) receptor and inhibit binding of spike protein at ACE-2 receptor.	Oral	Positive
Ritonavir and Lopinavir combination (Antiretrovirals medicines)	Act as Protease inhibitors.	Oral	Positive
Favipiravir	RNA polymerase.	Oral	Negative
Convalescent Plasma	Polyclonal human antibodies.	I.V	Positive
Remdesivir	RNA polymerase inhibitors.	I.V	Positive
Tocilizumab	Anti-IL-6 Monoclonal Ab.	I.V	Positive

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