



How COVID-19 Affects Expecting Women?

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Abstract

Corona virus is added to the family of pathogenic viruses in 2019. Nearly 18/20 months passed since this virus started infecting human beings and soon it became pandemic. Its behavioural pattern is not well defined towards special conditions/phases of humans. Logically speaking expecting women are immune-compromised and therefore they are vulnerable to this corona (SARS-CoV2) strain. Although information is scanty on this particular phase of women's life regarding pathogenesis and vaccination, we have described in this short review the information so far available. The fact that virus cannot pass through the placenta, so foetus is safe even the mother is infected. Moreover it is also shown that antibodies against SARS-CoV2 (both IgG and IgM), can pass through the placenta the corona vaccine will give extra protection to the foetus.

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Introduction

First anniversary of Covid-19 is over, so far corona pandemic is not tapering down, rather than in some places on global basis it is even spreading its wings. In the year 2020 about 140 million children were born. It means 140 million women were pregnant. What happened to them during this corona era? Now we have enough data to analyse and take safety steps for the future events to come since, still corona has not gone from the world [1].

Foetuses are influenced by many factors for their development in the womb; other factors being almost the same as they were in the previous years, but in 2020 a new factor was added and that is corona virus that can be incredibly sensitive to both stressful environments and toxic assaults on the mother's health also. Infections with viruses like Zika or varicella, the culprit behind chickenpox, can cause serious birth defects [2,3] and lead to devastating cognitive difficulties and visual impair-



ment. But will exposure to COVID-19 wreak the same kind of havoc on pregnant moms and their unborn babies?.

Infections during pregnancy

There is a great impact of microbiota on gestational health and outcome. In a recent study of the vaginal, gut, and oral microbiomes in 292 samples from 10 subjects sampled every three weeks throughout pregnancy was done by David A. Relman's group and showed that the diversity of *Lactobacillus iners*-dominated communities in the vagina, unlike most other vaginal community types, which significantly increased with gestational age [4]. The virus that causes COVID-19 infects people of all ages. However, evidence to date suggests that two groups of people are at a higher risk of getting severe COVID-19 disease. These are older people (that is people over 60 years old); and those with underlying medical conditions (such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer). The risk of severe disease gradually increases with age starting from around 40 years. It's important that adults in this age range protect themselves and in turn protect others who may be more vulnerable.

WHO has issued advice for these two groups and for community support to ensure that they are protected from COVID-19 without being isolated, stigmatized, left in a position of increased vulnerability or unable to access basic provisions and social care.

Avoiding the corona virus during pregnancy

Avoiding infection with the corona virus is a top priority for pregnant women. Adhere to precautions carefully: Stay at least 6 feet from others, wear a mask, and avoid large gatherings and indoor socializing outside of your household [1].

To prevent any infection we need strong immunity. Let's first see, how foetuses and babies after birth are protected by their own immunity?. Foetuses are quite safe in the sterile environment in the womb as for as infections are concerned. They are connected with mother through placenta. Through placenta no organisms can pass through including recently described SARS-CoV2 virus [5,6], however circulating antibodies in mother's blood specially IgG can pass through placenta. According to recent reports the bigger molecule IgM can also pass through the placenta in case mothers are infected with SARS-CoV2 [6]. Finally, pregnant women should be vaccinated against influenza (the flu). Pregnant women who get the flu can get very sick, and having a high fever raises the risk of harm to your baby.

Delivery mode

During birth, bacteria from the mother's vagina are passed on to the baby. This seedling helps to build the colony of bacteria in the gut that contributes to their immunity however; this is missing in C section born babies [7].

After birth, more antibodies are passed on to the baby through colostrum and breast milk. But babies' immune systems are still not as strong as adults'. Premature babies are at greater risk of infection because their immune systems are even more immature and they haven't had as many antibodies passed to them from their mothers. Babies produce their own antibodies every time they are exposed to a virus or germ, but it takes time for this immunity to fully develop [8]. The passive immunity passed on from the mother at birth also doesn't last long and will start to decrease in the first few weeks and months after birth [7].

Recent studies on COVID-19 infected more than 2100 pregnant women from 18 countries found that

Eleven women with COVID-19 died, 60% to 97% increased rate of preterm birth, The higher rates of preterm birth found in lower income countries. About 13% of babies tested positive for the virus, fivefold increase in neonatal complications such as immature lungs, brain damage, and eye disorders. Breastfeeding didn't appear to transmit the virus - A small bit of good news.

Corona virus complications

Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) is already linked to possible induction of pregnancy complications such as higher rate of Caesareans and preterm births including miscarriage, foetal malformations, foetal growth restriction and/or stillbirth. However, even if a neonate tests negative for SARS-CoV-2, frequent abnormal findings, include foetal and maternal vascular malperfusion, have been reported in cases of COVID-19-positive mothers [9]. But evidence is scant as to whether the virus can cross the placental barrier to infect the foetus [6].

Comorbidities affect COVID-19

Comorbidities are a serious health concern because of compromised immune system. When a woman experiences comorbid conditions, they may need additional care. The researchers looked at all the available data and found that having comorbidities also increases the chances of corona virus infection [10]. They also concluded that patients with a history of hypertension, obesity, chronic lung disease, diabetes, or cardiovascular disease have the worst prognosis and most often end up with deteriorating outcomes, such as the life-threatening lung injury ARDS (acute respiratory distress syndrome) and pneumonia [11].

Altered endocrinology

During pregnancy female reproductive steroids, estrogen and progesterone ratios change; their active metabolite, allopregnanolone which are responsible for providing anti-inflammatory functions, reshape competence of immune cells, stimulate antibody production and promote respiratory epithelial cell repair, and inhibit the ACE2 receptor reduces the chances for the novel corona virus (SARS-CoV-2) to infect the mothers [12,13].

Immunity and vaccination

When a woman gets pregnant, her hormonal milieu changes which in turn changes the immune system that becomes weak. This change in a way is good for the embryo because the mother recognizes embryo as a foreign body, and still allows it to implant. It is important to know that not much is known about specifically corona virus vaccine in pregnant and lactating women, though there have been a few pregnant women who were included in the vaccine trials [14]. Preliminary developmental and reproductive toxicity studies do not indicate any adverse effects on reproduction or foetal development. Thus, there are not any known safety concerns, but more data will be available in the weeks and months ahead from additional studies [15]. The World Health Organization (WHO) states that they do not have any reason to believe any specific risks that would outweigh the benefits of vaccination for pregnant women.

Based upon available data, it appears safe to get the COVID-19 vaccine for mothers who are nursing a baby. Although the

vaccines have not been studied in nursing mothers, lactating women should be offered the COVID-19 vaccine. The vaccines do not contain live virus, so being vaccinated does not pose a risk to the baby. If you are vaccinated for the corona virus, there is no need to delay or discontinue breastfeeding [16].

Immunization also decreases the inflammatory immune response to diminish foetal rejection, and all vaccines have to protect mothers against infection during pregnancy and for the rest of their lifetime, being pregnant does not put the women at higher risk of getting COVID-19.

There is no risk or bad effect for lactating women or their infants if they choose to be vaccinated; there's no concern from a safety perspective. Multiple studies show that there are antibodies in a vaccinated mother's milk. This has led some women to try to restart breastfeeding and others to share milk with friends' children [16].

Additionally, there is no evidence to date that any vaccines, including COVID-19 vaccines, cause fertility problems [17].

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