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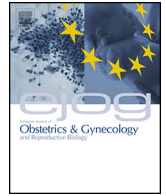
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Review article



EBCOG position statement on COVID-19 vaccination for pregnant and breastfeeding women

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ABSTRACT

Covid 19 pandemic has led to significant mortality and long term morbidity globally. Pregnant women are at increased risk of severe illness from COVID 19 infection. There is an urgent need for all health authorities and Governments to offer vaccination to all pregnant women especially those with high risk pregnancy.

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Contents

The risks of Covid-19 infection during pregnancy and breastfeeding	257
Covid-19 vaccines	257
EBCOG position	257
EBCOG supports that COVID-19 vaccination be recommended to all breastfeeding women, in the absence of a specific contraindication ..	257
References	258

The risks of Covid-19 infection during pregnancy and breastfeeding

There is now strong evidence that pregnant women are at increased risk for severe illness from COVID-19 when compared with non-pregnant women, particularly when infection occurs during the third trimester of pregnancy [1–3]. The risk of intensive care unit admission is around 1% in this population, and the risk of invasive mechanical ventilation around 0.3% [1,2]. These values are *circa* three times higher than those of the non-pregnant population of the same age. While the absolute risk of death from COVID-19 in pregnant women remains low, at about 0.15% in symptomatic patients, it is around 70% higher than that of non-pregnant women of the same age [1,2]. Maternal conditions such as age over 40 years, obesity, chronic hypertension, and preexisting diabetes are additional risk factors for severe disease [1,2,4].

There is also evidence that COVID-19 infection during pregnancy increases the risk of preterm birth about three-fold, mainly due to iatrogenic preterm delivery [1,2]. Vertical transmission of SARS-CoV-2 [5] occurs in approximately 2.5% of pregnant women and appears to be mainly limited to cases of third-trimester infection [6].

For all the reasons described above, pregnant women need to be considered a high-risk population for serious COVID-19 infection, and there are clear benefits for both mother and fetus of avoiding this disease during pregnancy [7,8]. Breastfeeding women are believed to have similar risks of serious disease as non-pregnant women.

Covid-19 vaccines

Currently authorized COVID-19 vaccines in Europe use different technologies, including messenger RNA (mRNA), viral vectors, and recombinant proteins produced in a baculovirus system. However, none of them use live viruses, therefore they are not capable of causing disease [9,10]. Other vaccines that do not use live viruses show no evidence of increased risk during human pregnancy and breastfeeding [11].

Existing vaccines do not interact with individuals' DNA or cause genetic mutations [9–11]. Animal studies did not reveal any safety concerns regarding female reproduction, embryo-fetal or neonatal development [9,11].

All these vaccines were rigorously evaluated in randomised controlled trials, but pregnancy and breastfeeding were exclusion criteria [9–11]. There is limited data from pregnant women who were inadvertently enrolled in these trials, but it is reassuring on the safety of vaccination in pregnancy [9,11]. Self-reported information after ongoing COVID-19 vaccination in the USA (86 956 pregnant women, as of the 12th April 2021 [12], of which 35 691 have been the subject of a publication [13]) has not revealed any safety issues, but follow-up is naturally short. It is strongly believed that COVID-19 vaccines do not cause any harm to newborns by way of breastmilk [14].

In a small prospective study [15] comparing 84 pregnant, 31 breastfeeding, and 16 non-pregnant women vaccinated with a mRNA vaccine, vaccine-induced immune responses were similar,

and higher antibody titers were found after vaccination than after infection in pregnancy. Vaccine-generated antibodies were found in umbilical cord blood and breast milk samples, showing a potential for fetal and neonatal immunization with maternal vaccination.

Of late, several cases of cerebral vessels thrombotic (CVT) events following immunization with COVID-19 viral vector vaccines (Astra Zeneca and Johnson & Johnson) have been reported, more commonly in women. Nevertheless, they remain a rare event, with an incidence of about 4.1 per million compared with the incidence of 39.0 per million people with a diagnosis of Covid [16]. The European Medicine Agency (EMA) and the United Kingdom Medicines & Healthcare products Regulatory Agency (MHRA) have stated that the benefits of vaccination clearly outweigh the risks. Currently there is no evidence on the risk of thrombotic events following immunization with COVID-19 viral vector vaccines in pregnancy, a well-known prothrombotic state. Women should be counseled as regards this potential risk, and healthcare professionals should have a low threshold for investigation, if a thrombotic event is suspected [17,18].

EBCOG position

All vaccination during pregnancy is naturally optional, but healthcare providers need to advise women about the risks of acquiring COVID-19 infection in pregnancy, as well as the limited existing evidence on the benefits and potential side effects of existing vaccines, as a basis to shared decision-making on this issue. EBCOG acknowledges that a clear indication from healthcare providers would improve adherence to vaccination programs and reduce women's anxiety with the decision [7], but this is not possible with the currently existing evidence.

EBCOG acknowledges that there is limited evidence on the long-term safety of COVID-19 vaccination during pregnancy, and that there is a need for more robust data before it can be recommended to all pregnant women. Nevertheless, **the possibility of vaccination should be offered to all pregnant women, after being adequately informed of the benefits and risks. EBCOG urges all Health Authorities and Governments to make vaccination available to all pregnant women wishing to take them.**

In women with the co-morbidities listed above, and in those at higher-risk of exposure to the disease, EBCOG considers that the benefits are likely to outweigh the predictable risks, and therefore **vaccination should be recommended to high-risk pregnant women, in the absence of contraindications.** There is currently insufficient data regarding the preferential use of a particular COVID-19 vaccine.

EBCOG supports that COVID-19 vaccination be recommended to all breastfeeding women, in the absence of a specific contraindication

The position statement has been approved by the officers group of EBCOG and the executive board of EBCOG.

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