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SARS-CoV-2 infection and glucose homeostasis in pregnancy. What about antenatal corticosteroids?

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ABSTRACT

Background and aims: Administration of corticosteroids is common in obstetric practice. In this concise review we queried on the effects of corticosteroids in pregnancies complicated by SARS-CoV-2.
Methods: We performed a literature search on PubMed, regarding the use of corticosteroids in patients with SARS-CoV-2 infection, in pregnancies complicated by SARS-CoV-2, as well as their impact on glycemia in pregnant women with or without diabetes. Furthermore, we searched for effects of SARS-CoV-2 and of other coronaviridae on insulin secretion and glycemia.
Results: SARS-CoV-2 infection appears to be a risk factor for complications in pregnancy. Corticosteroids may not be recommended for treating SARS-CoV-2 pneumonia but they may be needed for at-risk pregnancies. Corticosteroids in pregnancy have a diabetogenic potential. SARS-CoV-2 and other coronaviridae may have effects on glycemia.
Conclusions: Caution should be exercised while using corticosteroids in pregnant women with COVID-19 requiring preterm delivery.

1. Introduction

While the healthcare community worldwide struggles to manage the novel SARS-CoV-2 (Severe Acute Respiratory Coronavirus 2; Covid-19) pandemic, it is of great importance to ensure that optimal care continues to be given to special groups of patients such as pregnant women. Pregnancy is a physiological condition during which the ensuing immune suppression can lead to vulnerability to viral infections [1,2]. SARS-CoV-2 infection may have serious consequences for pregnant women, especially when there are associated comorbidities like hyperglycemia and hypertension [1,3]. Limited bibliographic data conclude that SARS-CoV-2 appears to be a considerable risk factor for premature rupture of membranes, preterm delivery (20–47%), intrauterine growth restriction (10%), fetal tachycardia and fetal distress when the infection occurs in the last trimester of pregnancy [1–6]. Administration of corticosteroids (usually betamethasone, BM) is common in obstetric practice. Usually one or two doses of BM, 24h apart, are administered intramuscularly from the 23rd to 34th week of gestation, promoting embryonic lung maturation, particularly when preeclampsia or premature rupture of membranes may lead to premature birth (or imminent birth within 7 days) [7,8]. The diabetogenic effect of BM is known; its combination with gestational (placental) insulin resistance leads to a transient increase in blood glucose levels of pregnant women [9,10]. Particular attention is needed for women with pre-existing diabetes or with gestational diabetes (GDM) under insulin therapy, where hyperglycemia can lead to severe neonatal hypoglycemia in case of preterm delivery [9–11]. In such cases, the recommended increase in insulin dose by 30%–40% in order to prevent very high blood glucose levels, may be inadequate [9–14].

2. Corticosteroid use in GDM and SARS-CoV-2

Corticosteroids in the treatment of SARS-CoV-2 pneumonia are not usually recommended; they may delay virus clearance from the body [1,3]. Furthermore, glucocorticoids may not have any significant impact on mortality, based on past knowledge of infections with SARS-CoV (Severe Acute Respiratory Syndrome Coronavirus) and MERS (Middle East Respiratory Syndrome), who also belong to the same coronaviridae family with SARS-CoV-2 [15]. Short-term administration of methylprednisolone has been used in some cases of SARS-CoV-2, to ameliorate lung inflammation and prevent

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acute respiratory distress syndrome, without further data in case of pregnancy [1]. Therefore, extreme caution should be given, regarding the use of antenatal corticosteroids, in case of pregnant women with SARS-CoV-2 requiring preterm delivery [1,3,4,16]. Although use of BM should be considered to promote fetal lung maturity, it should be done bearing in mind that it could also worsen the clinical condition in already (possibly critically) ill patients [4]. Furthermore, based on preliminary reports of hyperglycemia in patients with SARS-CoV-2 infection due to endogenous stress-induced glucocorticoid hypersecretion or transient impairment of pancreatic islet cell function, the related hyperglycemia should not be underestimated, since it may lead to additional immune suppression and further complications [17], especially after BM administration in pregnant women. Hyperglycemia in pregnancy complicated by SARS-CoV-2 infection and requiring medical intervention should be treated by insulin [4]. When BM administration is considered to be essential for a viable fetus, a more conservative use of BM, with a single 12 mg dose, might still be beneficial and have a milder effect on glycemia, in accordance to recent literature [7,13,14,18]. Since there are few small studies in the literature regarding the management of pregnant women with SARS-CoV-2 (and possibly lacking reliable conclusions), the decision about the use of antenatal corticosteroids should be carefully made in consultation with infectious disease specialists, obstetricians and neonatologists [4,16]. Until additional data on pregnant women with SARS-CoV-2 become available, intensive monitoring of infected pregnant women during the time of BM administration is crucial.

Authors' contributions

All authors contributed to the concept and design of the manuscript, as well as in drafting and revising the manuscript. All authors approved the final submitted version of the manuscript.

Declaration of competing interest

Re: Conflict of Interest for manuscript titled: "Covid-19 and glucose homeostasis in pregnancy. What about antenatal corticosteroids?" by Ioannis Kakoulidis, Ioannis Ilias, Eftychia Koukkou.

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