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Short Communication

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COVID-19 and Preeclampsia

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Abstract

COVID-19 is RNA virus with many systemic effects, including hypertension. Preeclampsia leads to maternal and fetal morbidity and mortality. In addition, Preeclampsia and COVID -19 aggravate the risk of ICU admission and maternal death.

Keywords: COVID-19, Preeclampsia, Hypertension, Aspirin.

Preeclampsia affects 3-10% of all pregnancies and has a negative maternal and fetal outcome, leading to 20–80% of maternal mortality, mainly in low and middle-income countries [1, 2]. More than 287,000 women die annually due to pregnancy-related diseases, and eclampsia accounts for 10-15% of them [3].

Some Physiological changes during pregnancy make pregnant women more susceptible to complications, including increased oxygen consumption, heart rate, reduced lung capacity, and shift away from cell-mediated immunity [4]. In addition, during pregnancy, syncytiotrophoblast, cytotrophoblast, endothelium, and vascular smooth muscle of the villi, are affected by angiotensin-converting enzyme 2 (ACE2) [5].

The American College of Obstetricians and Gynecologists (ACOG) 2018 defined preeclampsia as the presence of a new-onset of high blood pressure after 20 weeks of gestation in previously normal blood pressure women. It consists of Systolic blood pressure of 140 mm Hg or more or diastolic blood pressure of 90 mm Hg or more on two settings at least 4 hours apart, with the presence of proteinuria. In the absence of proteinuria, it is defined as new-onset hypertension with the new-onset headache, new onset of thrombocytopenia, Renal insufficiency, Impaired liver function, and Pulmonary edema [6].

COVID-19 is a respiratory infection, single-stranded viruses with an encapsulated RNA, but it has many systemic effects, including hypertension, thrombocytopenia, kidney disease, and liver injury [7-11]. COVID-19 pregnant woman can be asymptomatic or present with fever, cough, and shortness of breath [12]. Meta-analysis of recent good-quality cohort studies shows evidence that symptomatic or severe COVID-19 is associated with a considerable risk of preeclampsia, preterm birth, and low birth weight [13].

COVID-19 can cause vascular effect, which leads to hypertension, preeclampsia, hepatic and renal disorders [14]. For example, one study reported that pregnant women with COVID-19 presented with elevated rates of maternal vascular malperfusion features associated with hypoxic injury of the placenta and lead to the development of preeclampsia [15]. Histopathology of the placenta shows a higher prevalence of decidual arteriopathy, decidual arteriopathies like atherosclerosis, fibrinoid necrosis, and mural hypertrophy of membrane arterioles, leading to the systemic inflammatory state of hypercoagulability [15].

However, the risks factors for COVID-19 during pregnancy and preeclampsia are almost the same, including diabetes, hypertension, and obesity [16-18]. In addition, up to 14% of COVID -19 patients can develop severe pneumonia, and 5% can develop severe acute respiratory syndrome (SARS) and requiring admission to intensive care (ICU) [19]. Furthermore, COVID-19 during pregnancy associated with maternal morbidity and mortality such as respiratory dysfunction need invasive mechanical ventilation or intensive care unit (ICU) admission [20]. Another study showed that pregnant women with COVID-19 are at increased risk of requiring admission to an intensive care unit (ICU), ventilation, and extracorporeal membrane oxygenation (ECMO) compared to non-pregnant women. The study addresses that pregnant women with COVID-19 had an increased risk of gestational diabetes and preeclampsia than those without COVID-19 [21].

The only treatment of preeclampsia is delivery of the placenta, as its exact etiology remains unknown [22]. Preeclampsia with severe features or HELLP syndrome should be one of the differ-

ential diagnoses of pregnant women with suspected or confirmed COVID-19, as these complications may coexist with the infection [23, 24].

The differential diagnosis might be challenging if COVID-19 pregnant women present with hypertension and proteinuria, thrombocytopenia, or elevated liver enzymes [25]. Mendoza et al. have introduced the concept of a "preeclampsia-like syndrome" associated with COVID-19. That soluble fms-like tyrosine kinase-1 / Placental growth factor (sFlt-1/PlGF), uterine artery pulsatility index (UtAPI), and lactate dehydrogenase (LDH) allow preeclampsia to differentiated from other preeclampsia-like syndromes present in some of the pregnant women with severe COVID-19 [24].

As recommended before that low-dose aspirin prevents preeclampsia in 60-90% of pregnant women [26]. Kwiatkowski et al. suggested providing first-trimester screening for placental complications disorders and prescribing low-dose aspirin in women at risk for preeclampsia and fetal growth restriction. Gavillet, M. et al. also support this recommendation [27, 28].

In conclusion, During COVID-19 pandemic screening is critical to identify high-risk patients for preeclampsia, further studies to define the association between COVID-19 and preeclampsia, and determine the safety of aspirin in COVID-19 patients.

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