Received: 12 May 2020 | Accepted: 9 June 2020

DOI: 10.1111/sji.12918

LETTER TO THE EDITOR

Scandinavian Journal of Immunology WILEY

COVID-19 and maternal pre-eclampsia: A synopsis

In March 2020, the World health organization reported coronavirus disease 2019 (COVID-19) as a pandemic.[1] Khan et al, 2020, in their systemic review about positive COVID-19 pregnant women, showed a rate of 29.1% preterm birth and 16.4% low birth weight among their babies.[2] This increases the interest that hyper-inflammatory state in COVID-19 may be associated with hypoxic injury in the placenta and developing pre-eclamptic state.

Pre-eclampsia is one of the hypertensive disorders of pregnancy that developed after 20th gestational week with proteinuria, and represent the leading cause of maternal and foetal morbidity and mortality in developed countries.[3] Our knowledge is restricted to that delivery is the only curative treatment, but we still know so little about its exact aetiology. Previous reports record that maternal infections, especially viral, contributing to the development of pre-eclampsia via suboptimal trophoblastic invasion and inducing maternal systematic inflammatory response.[4] For great interest, Angiotensin-converting enzyme 2 (ACE2) protein, the human homolog of ACE, that playing important rules in regulating blood pressure and protection of heart via hydrolysis of Angiotensin II to Angiotensin (1-7) act as a receptor for coronavirus to mediate its damage effects.[5]

ACE2 is expressed in excess amounts through human placenta in the syncytiotrophoblast, cytotrophoblast, endothelium and vascular smooth muscle of villi. Its function mainly in regulating blood pressure and foetal development. Possible COVID-19 intrauterine infection may alter the expression of ACE2 and develop pre-eclamptic state via raised Angiotensin II level in the placental villi leading to vasoconstriction and restricted foetal blood flow. That may give possible explanation for raised incidence of preterm and low birth weight in COVID-19 positive pregnant women.[6] However, further confirmatory studies are recommended.

Additionally, there are great similarities between COVID-19 positive patients and Pre-eclamptic women at immunological and laboratory basis. COVID-19 is characterized by increase pro-inflammatory cytokines such as interleukin (IL)-2, IL6, IL-7 and tumour necrosis factor-α (TNFα). Also, it is recommended to screen all COVID-19 severe patients using laboratory markers of hyper inflammation as increased serum ferritin and low platelet count.[7] Systematic review about maternal serum cytokines in pre-eclampsia revealed significant increase of maternal IL-6, IL-10 and TNFα compared with normotensive pregnant women.[8] Moreover, maternal serum ferritin is much higher in pre-eclamptic women compared to normotensive pregnant women which reflects proved hyper-inflammatory state.[9]

Finally, thrombocytopenia (<100 000/mL) is independent risk factor for severity in pre-eclampsia[3] and for great interest is one of defining criteria for cytopenia in H-score that used to assess severity of COVID-19 patients.[7]

In conclusion, we still have limited knowledge about the full immunological aspects of pre-eclampsia. Further studies are recommended to show the association between COVID-19 and development of pre-eclampsia. Until further research is available and no universal screening for COVID-19, we suggest that obstetricians should be aware about the risk of development of pre-eclampsia among pregnant women contagious to a positive COVID-19 patient or had a history of suggestive symptoms in early pregnancy.

CONFLICT OF INTEREST

The authors state that there are no conflicts of interest.

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