Hypertensive crisis in pregnancy with 2019-nCoV infection; confirmed with rt-PCR for nasopharyngeal swab

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Hypertensive crisis in pregnancy with 2019-nCoV infection; confirmed with rt-PCR for nasopharyngeal swab: A Case Report

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Running title - Hypertensive crisis in pregnancy with COVID19

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Case Report

A 19-year-old previously normotensive primi mother, presented from CoVID19 locked down area of Colombo, Sri Lanka, with reduced fetal movement for 6 hours and diarrhea 5 times a day for last 24 hours. She was 33 weeks pregnant and the uterine size was compatible with her period of gestation. So far her pregnancy was uncomplicated and there was no significant medical or surgical problem. She had no history of allergies. On admission she had high blood pressure of 170/ 100 mmHg with protein 3+ in urine dip stick analysis. She did not have impending symptoms or signs of eclampsia other than upper abdominal mild pain and tenderness.

Urgent sonography revealed intrauterine fetal demise and placental abruption. Fetal growth was compatible with 31 + 3/7 weeks without features suggestive of growth restriction. Amniotic fluid index was normal. Haematology revealed Hb of 5.2 g/dl (NRBC – 0.7%), WBC of 24.38 (Net – 81.7%, Lym – 13.2%), Plt – 210. Rest of the investigations including clotting, renal and liver function test were normal. Her blood pressure was controlled with 2 boluses of Hydralazine 5mg 30 minutes apart. Blood transfusion was started. Once the patient stabilized, emergency Caesarian section was performed with full personal protective gears. There was significant amount of free fluid noted within the abdominal cavity, Couvelaire uterus was noted. Dead

fetus showed signs of recent demise with fetal weight appropriate for gestational age. A large blood clot was noted separating the placenta confirming the ultrasound diagnosis of abruption. Later a postpartum bleeding ensued which was managed with a Bukri balloon tamponade device. After 3 consecutive blood transfusions her Hb level was 8.4 g/dL. The biophysical parameters remained stable throughout the immediate recovery period. Her rt-PCR-2019-nCoV for nasopharyngeal swab was tested to be positive on following day.

Discussion

Novel Corona virus was first identified in December 2019, Wuhan city, Hubei Province in China due to clusters of pneumonia associated with severe acute respiratory syndrome (1). The spectrum of disease caused by this 2019-nCoV (novel Corona Virus) is known as COVID19 (Corona Virus Disease). Clinical course of the disease ranges from mild to critical illness. 20% of cases remain asymptomatic throughout the course (2). Majority has mild symptoms and 5% has critical disease with complications. Overall case fatality rate is around 2.1% (3). Apart from respiratory and cardiovascular symptoms, some patients experience gastrointestinal disturbances such as nausea, vomiting and diarrhea as the first symptom (4,5). Diarrhea was one of the common symptom seen in 7% among 118 pregnant mothers in a case series observed in China (6). However, no significant increased risk was identified for intrauterine fetal death, neonatal death or early trimester loss among pregnant mothers.

Novel Corona virus is a RNA virus. Genome and the structure closely resembles to SARS-CoA and Corona virus found in bats. There is a membrane S glycoprotein which closely resembles the protein found in the bat Corona virus except for single amino acid (7). This is the adherence molecule and it facilitates endosomal internalization of the virus through the host cell bounded enzyme ACE2 (Angiotensin converting enzyme) (8, 9). Initial infection through the respiratory tract is thought to be via type 2 pneumocytes in the lungs (10). Other than that virus can affect other organ systems depending on the level of expression of ACE2 on their cell membrane (11, 12). Gastrointestinal tract, brain, myocardium and kidney abundantly express the ACE2. Effects of 2019-nCoV is believed to be local hyper-inflammation in each system (13).

There is evidence to say that the activation of RAAM (Renin Angiotensin Aldosterone Mechanism) and down regulation of ACE2 plays a major role in the pathological process of lung injury in SARS-CoV (14). In pregnant mothers, ACE2 is expressed abundantly in uterus (endometrium and myometrium), placenta, membranes and fetal tissues. Hence the transplacental transmission of 2019-nCoV is theoretically possible. However, recent studies do not support vertical transmission (15). ACE2 enzyme and rest of the component of utero-placental RAAM plays a key role in maintaining blood pressure, electrolyte and water homeostasis in a pregnant mother (16). ACE2 is a new component of RAAM, which was identified in 2000. It hydrolyses angiotensin 2 to angiotensin 1-7 (17). In animal studies overexpression of ACE2 significantly reduces the baseline blood pressure in the chronically hypertensive mice (18).

In a normal pregnancy there would be a large increase in plasma angiotensinogen due to abundancy of Oestriol (E3). This would result in excess RAAM activity and facilitate physiological hypervolemia in pregnancy (16). There is a notable progressive dysfunction in RAAM activity from early placentation among mothers with gestational hypertension and preeclampsia (16). On the other hand, activation of RAAM strongly plays a pivotal role in the pathophysiology of hypertensive emergencies (19). Hence, there is a theoretical possibility of hypertensive crisis associated with 2019-CoV associated ACE2/ RAAM dysfunction in pregnant mothers. This can be complicated with sudden placental abruption and intrauterine demises.

In conclusion; available clinical information regarding COVID19 effect on gestational hypertension and impact on placental function remains unknown. Whether 2019-nCoV precipitates placental dysfunction, worsen the blood pressure homeostasis and causes placental abruption is still unclear. However, there is a theoretical possibility of hypertensive emergencies that can follow COVID19. Therefore, it is important to be vigilant on blood pressure control in pregnant mothers, especially who already has hypertensive diseases. Emergency hospital admission and urgent attention must be given to mothers presenting with high blood pressure with the features suggestive of COVID19 during the 2019-nCoV pandemic, because their condition might rapidly deteriorate.

Disclosure of Interest – None to be disclosed

Contribution to Authorship

Dr Sajith Bandara – He involved in case management and followed up. Case was identified as an important academic matter. Prepare the initial draft after discussion with the rest of the team. He also involved in literature review, manuscript writing, final proofing and submission. Dr Anura Ruwanpathirana – He is the supervising consultant. He has involved in case management and followed up. Involve in preparing the draft and proofing the manuscript. Dr Dhammika Nagodawithana – He involved in case management and followed up. He also involved in literature review, manuscript writing, proofing and submission. Dr Samantha Alwis - He involved in case management and followed up. He also involved in literature review, manuscript writing, proofing and submission.

Details of patient's consent – informed written consent has been taken from patient. She has given her consent for discussing her problem in any academic forum. She is willing to remain anonymous.

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