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EARLY PREDICTION OF PREECLAMPSIA IN THE FIRST TRIMESTER AND ITS CORRELATION WITH COVID-19 INFECTION

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Preeclampsia (PE), a pregnancy induced multisystemic condition characterized by new onset hypertension with significant proteinuria and accounts for a maternal mortality rate greater than 50000 per year globally. PE is one of the leading causes of maternal and fetal mortality worldwide and affects 2-8% pregnant women worldwide. Left untreated it can lead to fatal maternal and fetal outcomes including stillbirth.

PE can be of 2 types, early onset PE (EOPE) occurring before 34 gestational weeks or late onset PE (LOPE) after 34 weeks. Nevertheless, the underlying pathogenesis of PE is still under debate. Over the past years, a myriad of pathways, risk factors and multifactorial etiologies have been identified as contributing factors. Genetic factors, maternal comorbidities such as diabetes mellitus, immunological imbalance leads to poor trophoblastic invasion thereby leading to inadequate uroplacental hypoperfusion and widespread endothelial dysfunction.

Diagnostic criteria for PE include new onset hypertension, proteinuria, thrombocytopenia, elevated liver enzymes and renal insufficiency. A blood pressure reading of 140/90 mmHg or more on 2 or more occasions, presence of protein 300mg or greater for 24h collection or 2+ or greater in case dipstick test, platelet count less than 100K/mm, liver enzymes elevated twice the upper limit is indicative of PE.

However, taking into account the level of mortality and morbidity associated with PE, early prediction and intervention is of utmost importance for early intervention. The American College of Obstetricians and Gynecologists and the National Institute for Care and Health Excellency developed screening guidelines based on maternal risk factors however evidence indicates it has suboptimal performance rate.

It is notable that the Fetal Medicine Foundation (FMF) developed a triple test which uses a combination of factors to evaluate the risk of PE. This prediction model has been evaluated across several continents and where all of them reported comparable data with detection rates over 90%. Additionally, studies have shown that increased serum total cholesterol during the 1st trimester had a significant association with the development of PE. As such, it is possible to include evaluation of lipid profile as a part of screening protocol for PE due to these observed variations.

In the recent years, the pandemic caused by COVID-19 infection was accountable for numerous multi-organs disorders, the majority being of pulmonary origin. Likewise, it also causes severe maternal complications in pregnant women, one of them being increased incidence of PE in affected women. Several studies have established the link between COVID-19 and increased incidence of PE is due to an overlapping immunopathological mechanism between PE and COVID-19. The factors involved include the upregulation of the angiotensin converting enzyme 2, alpha-1 antitrypsin, and an interplay between substance C and coagulation. All these disturbances lead to hypoxic injury, histopathological changes in the placenta and decreased vascular perfusion ultimately resulting in the occurrence of PE.

In conclusion, the screening protocols need to be up to date with current scientific findings and incorporate recent advances. The increased rate of PE in COVID-19 affected patients can also be used as an added factor during screening owing to its interlinked mechanisms.