

## Endotheliopathy biomarkers and angiogenic factors in distinguishing preeclampsia from COVID-19 in pregnancy

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### Objective

To explore the performance of endotheliopathy biomarkers and angiogenic factors in distinguishing preeclampsia (PE) from COVID-19 in pregnancy.

### Methods

Plasma and sera samples were obtained from pregnant women with COVID-19 infection (n=18) and patients with PE (n=13). Biomarker assessment included circulating VCAM-1, soluble TNF-receptor I (sTNFR1), angiotensin II (Ang2), heparan sulfate (HS), thrombomodulin (TM), C5b9, PAI-1, ADAMTS-13 activity, fms-like tyrosine kinase-1 (sFlt1) and placental growth factor (PlGF). The area under the ROC curve was calculated for each of the biomarkers and for the sFlt1/PlGF ratio.

### Results

VCAM-1, TNFR1, ANGII, C5b9, sFlt1 and sFlt1/PlGF ratio were significantly higher ( $p<0.05$ ) in PE whereas HS and PlGF were significantly lower ( $p<0.05$ ) compared to patients with COVID-19. No differences were observed in TM, PAI-1, ADAMTS-13 activity between the study groups. sFlt1/PlGF ratio showed the highest area under the curve (0.96) with a detection rate of 90% for 10% false positive rate. PlGF has the lowest area under the curve (0.70) among the studied biomarkers with a detection rate of 0% for 10% false positive rate.

### Conclusion

PE could be distinguished from COVID-19 by sFlt1/PlGF ratio and other endotheliopathy biomarkers. PlGF should not be used alone in this context. Instead, the use of sFlt1/PlGF ratio is the best candidate to detect PE and rule out COVID-19.