

# Patomekanisme Preeklamsia: Kajian terhadap Syncytial Bridge, Sel T Regulator, Laktat Dehidrogenase, Vitamin D, dan Seng = Pathomechanism in Preeclampsia: Focus on the Relationship between Syncytial Bridge, Treg Cell, Lactate Dehydrogenase, Vitamin D, and Zinc.

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## Abstrak

Preeklamsia merupakan kondisi spesifik pada kehamilan yang menjadi penyebab utama morbiditas dan mortalitas maternal-perinatal. Plasentasi abnormal menyebabkan hipoksia plasenta dan gangguan regulasi responns imun sehingga mengakibatkan perubahan mikroskopik struktur plasenta berupa penurunan syncytial bridge. Penelitian ini bertujuan mengetahui toleransi imun dan nekrosis pada preeklamsia berdasarkan gambaran syncytial bridge, jumlah sel Treg, konsentrasi LDH serta profil vitamin 1,25(OH)2D3, dan seng.

Penelitian potong lintang ini dilakukan pada bulan Februari–Agustus 2019 di RS Budi Kemuliaan dan RSUD Koja, Jakarta. Subjek penelitian adalah ibu hamil normotensi dan preeklamsia yang memenuhi kriteria penerimaan dan tidak memenuhi kriteria penolakan. Subjek dibagi tiga kelompok yaitu: normotensi/NT (n = 20), preeklamsia tanpa komplikasi/PE (n = 21), dan preeklamsia dengan komplikasi/PEK (n = 20). Semua subjek dilakukan pengukuran. jumlah syncytial bridge plasenta (HE), jumlah sel Treg (flowcytometric dan IHK), konsentrasi LDH (enzymatic colorimetric dan ELISA), vitamin 1,25(OH)2D3 (LC-MS/MS) dan seng (ICP-MS) darah maternal dan plasenta. Data diolah menggunakan SPSS versi 2 dan dianalisis dengan uji test-tidak berpasangan dan Mann-Whitney.

Jumlah syncytial bridge pada kelompok PE (10,52/LPB) dan PEK (6,33/LPB) lebih rendah bermakna dibanding NT (14,71/LPB). Syncytial bridge PEK lebih rendah bermakna dibanding PE. Jumlah Treg plasenta kelompok PE (2,89/LPB) dan PEK (2,94/LPB) lebih rendah bermakna dibanding NT (4,11/LPB). Konsentrasi LDH maternal pada PEK (418U/L) lebih tinggi dibanding NT (167,5 U/L), dan PEK lebih tinggi dibanding PE (204 U/L) secara bermakna. Konsentrasi 1,25(OH)2D3 maternal kelompok PE (55 pg/mL) dan PEK (41,3 pg/mL) lebih rendah dibanding NT (63,5 pg/mL). Konsentrasi 1,25(OH)2D3 maternal PEK lebih rendah bermakna dibanding PE. Tidak ada perbedaan bermakna konsentrasi seng maternal dan plasenta pada ketiga kelompok.

Sel Treg plasenta kelompok syncytial bridge sangat rendah (SSR) 2,86/LPB dan syncytial bridge rendah (SR) 3,09/LPB lebih rendah secara bermakna dibanding syncytial bridge normal (SN) 3,87/LPB. Konsentrasi LDH maternal SSR (318 U/L) lebih tinggi bermakna dibanding SR (213 U/L) dan SN (168

U/L). Konsentrasi vitamin 1,25(OH)2D3 maternal pada SSR (39 pg/mL) lebih rendah dibandingkan SR (53,85 pg/mL) dan SN (58,10 pg/mL). Peningkatan konsentrasi LDH maternal, penurunan konsentrasi 1,25(OH)2D3 maternal dan sel Treg plasenta merupakan faktor risiko berkurangnya jumlah syncytial bridge. Disimpulkan berkurangnya jumlah syncytial bridge menggambarkan beratnya proses nekrosis yang berhubungan dengan penurunan toleransi imun dan konsentrasi 1,25(OH)2D3 maternal.

.....Preeclampsia is a specific condition in pregnancy as the main cause of maternal-perinatal morbidity and mortality. Abnormal placentation causes placental hypoxia and disturbances in the regulation of the immune response, thereby resulting in the microscopic structure of the placenta in the form of syncytial bridges. The present study aimed to determine the immune tolerance and necrosis in preeclampsia, on the basis of the syncytial bridge characteristic, Treg cell count, LDH concentration and vitamin 1,25(OH)2D3, and zinc profiles.

This cross-sectional study was carried out from February to August 2019 at RS Budi Kemuliaan and RSUD Koja, Jakarta. The subjects were pregnant women who met the inclusion criteria and did not meet the exclusion criteria. The subjects were divided into three groups, namely the normotensive (NT) group (n = 20), the uncomplicated preeclampsia (PE) group (n = 21), and the complicated preeclampsia (PEC) group (n = 20). All subjects underwent the following examinations: placental syncytial bridge count (HE), Treg cell count (flowcytometric and IHC), LDH (enzymatic colorimetric and ELISA), 1,25(OH)2D3 (LC-MS/MS) and zinc (ICP-MS) concentration in maternal blood and placenta. The data were processed using SPSS version 20 and analyzed by means of the unpaired t and Mann-Whitney tests.

The syncytial bridge count in groups PE (10.52/HPF) and PEC (6.33/HPF) was significantly lower compared with NT (14.71/HPF). PEC syncytial bridge count was significantly lower than PE. Placental Treg count in groups PE (2.89/HPF) and PEC (2.94/HPF) were significantly lower than that of the NT (4.11/HPF). Maternal LDH concentration in PEC (418U/L) was significantly higher than in NT (167.5 U/L), and PE (204 U/L). Maternal 1,25(OH)2D3 concentration in groups PE (55 pg/mL) and PEC (41.3 pg/mL) was lower compared with NT (63.5 pg/mL). Maternal 1,25(OH)2D3 concentration in group PEC was significantly lower than in PE. There were no significant differences in maternal blood and placental zinc concentration in the three groups. Placental Treg cell counts in the very low syncytial bridge count (VLSB) group (2.86/HPF) and the low syncytial bridge count (LSB) (3.09/HPF) were significantly lower than in the normal syncytial bridge count (NSB) (3.87/HPF). Maternal blood LDH in group VLSB (318 U/L) was higher than those in LSB (213 U/L) and NSB (168 U/L). Maternal 1,25(OH)2D3 concentration in group VLSB (39 pg/mL) was lower compared with LSB (53.85 pg/mL) and NSB (58.10 pg/mL). Increased maternal LDH concentration, decreased maternal 1,25(OH)2D3 concentration and placental Treg cell count were risk factors for decreased syncytial bridge count. It was concluded that the decrease in syncytial bridge count depicts the severity of the necrotic process that is associated with decreased immune tolerance and maternal 1,25(OH)2D3 concentration.