Hubungan Kadar 25(OH)D Plasenta dengan Kadar Biomarka Nekroptosis pada Plasenta Kelahiran Normal dan Preeklamsia = The Relationship Between Placental Vitamin D and Necroptosis Markers in Normal and Preeclamptic Patients

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Abstrak

Latar belakang: Preeklamsia dihubungkan dengan kondisi inflamasi. Nekroptosis adalah kematian sel terprogram dengan luaran keadaan inflamasi. Vitamin D diketahui memiliki sifat anti-inflamasi, namun sampai saat ini belum ada penelitian yang mengaitkan konsentrasi vitamin D dan nekroptosis dalam pathogenesis preeklamsia. Penelitian ini bertujuan untuk mengevaluasi status vitamin D dan aktivitas nekroptosis pada preeklamsia.
Metode: Studi potong lintang dilakukan di Jakarta selama tahun 2021-2023. Subjek dikelompokkan menjadi normal dan preeklampsia. Setelah persalinan, sampel darah vena dan plasenta diambil. Pengukuran konsentrasi 25(OH)D sampel serum dan plasenta dilakukan dengan LC-MS/MS. Imunohistokimia dilakukan untuk mengukur nekrosom RIPK1, RIPK3, dan MLKL pada trofoblas dan endotel.
Hasil: Sebanyak 60 subjek terlibat dalam studi (31 normal, 29 preeklampsia). Kelompok preeklampsia memiliki usia gestasi yang lebih rendah (35 vs 38 minggu), berat lahir yang lebih rendah (3080.33 ± 454.62 g vs 2283.27 ± 833.63 g), berat plasenta yang lebih rendah (580.40 ± 129.36 g vs 453.06 ± 173.65 g), kadar 25(OH)D plasenta yang lebih rendah (15.00 (3.50 – 58.00) vs 26.50 (5.00 – 153.00) ng/mL, p=0.014), dan kadar RIPK3 trofoblas yang lebih tinggi (93.88 (23.94) vs 76.20 (20.59), p=0.003). Ditemukan korelasi negatif sedang antara kadar 25(OH)D plasenta dan kadar RIPK3 trofoblas (-0.352, p=0.003), RIPK3 endotel (r=-0.244, p=0.03), dan MLKL trofoblas (r=-0.296, p=0.011).
Kesimpulan: Adanya korelasi negatif sedang antara 25(OH)D dan nekrosom trofoblas dapat menunjukkan efek protektif vitamin D terhadap nekroptosis pada patogenesis preeklamsia.
.....Background: Preeclampsia is correlated with inflammatory condition. Necroptosis is programmed cell death with inflammatory state. Vitamin D has anti-inflammatory properties, however, there has been no study linking vitamin D and necroptosis in preeclampsia. This study aimed to evaluate vitamin D status and necroptosis activity in preeclampsia.
Methods: A cross-sectional study was conducted in Jakarta during 2021-2023. Subjects were grouped into normal and preeclampsia. Following delivery, venous blood and placental samples were taken. Serum and placental 25(OH)D assay were performed by LC-MS/MS. Immunohistochemistry was performed to measure necrosomes RIPK1, RIPK3, and MLKL in trophoblast and endothelial.
Results: A total of 60 subjects participated (31 normal, 29 preeclampsia). Preeclampsia group had lower gestational age (35 vs 38 weeks), lower birth weight (3080.33 ± 454.62 g vs 2283.27 ± 833.63 g), lower placental weight (580.40 ± 129.36 g vs 453.06 ± 173.65 g), lower placental 25(OH)D (15.00 (3.50 – 58.00) vs 26.50 (5.00 – 153.00) ng/mL, p=0.014), and higher trophoblast RIPK3 (93.88 (23.94) vs 76.20 (20.59), p=0.003). A moderate negative correlation between placental 25(OH)D and trophoblast RIPK3 (-0.352,p=0.003), endothelial RIPK3 (r=-0.244, p=0.03), and trophoblast MLKL (r=-0.296,r-0.011) were observed.

Conclusion: Moderate negative correlation between 25(OH)D and trophoblast necrosomes suggest protective effect of vitamin D against necroptosis.
Keywords: Preeclampsia, necroptosis, cell death, vitamin D, pregnancy, inflammation