

## ABSTRAK

### ANALISIS POLA PERUBAHAN AKTIVITAS ENZIM GLUKOSA-6-FOSFAT DEHIDROGENASE (G6PD), KADAR eNOS, DAN F2-ISOPROSTAN PADA PASIEN PREEKLAMPSIA DI SURABAYA

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**Latar Belakang:** Preeklampsia (PE) merupakan kegagalan plasenta dalam kehamilan akibat ROS yang tinggi. Kadar ROS yang tinggi, menimbulkan stress oksidatif, menyebabkan gangguan keseimbangan redoks dalam tubuh. G6PD adalah enzim penghasil NADPH untuk meredam ROS. Tujuan penelitian ini adalah untuk menganalisis pola perubahan aktivitas enzim G6PD, kadar eNOS dan F2-isoprostan pada pasien PE di Surabaya.

**Metode:** Sebanyak 140 ibu hamil dibagi menjadi kelompok PE (n=70) dan non-PE (n=70). Data usia partisipan, usia kehamilan, jumlah pernikahan, jumlah kehamilan, suku, IMT, kadar Hb, tekanan darah dan proteinuria untuk mengetahui faktor risiko. Pengukuran aktivitas G6PD dengan spektrofotometri, kadar eNOS, dan F2-isoprostan dengan ELISA.

**Hasil:** Tidak didapatkan perbedaan bermakna antara kelompok ( $p \geq 0,05$ ) pada usia, jumlah pernikahan, jumlah kehamilan, dan kadar Hb. Sedangkan suku, usia kehamilan, IMT, tekanan darah, dan proteinuria ada perbedaan yang bermakna antar kelompok ( $p < 0,05$ ). Pola perubahan aktivitas enzim G6PD dan kadar eNOS lebih meningkat bermakna ( $p < 0,05$ ) pada PE. Sedangkan pola perubahan kadar F2-isoprostan menunjukkan penurunan kadar yang tidak bermakna pada PE ( $p > 0,05$ ). Berdasarkan aktivitas enzim G6PD, didapatkan pola perubahan kadar eNOS yang tidak bermakna ( $p \geq 0,05$ ), tetapi rerata kadar eNOS cenderung meningkat. Sedangkan aktivitas enzim G6PD terhadap kadar F2-isoprostan terdapat pola penurunan kadar F2-isoprostan yang bermakna ( $p < 0,05$ ).

**Kesimpulan:** Terdapat pola peningkatan aktivitas enzim G6PD dan kadar eNOS pada PE. Berdasarkan aktivitas G6PD, didapatkan pola kadar F2-isoprostan menurun dan kadar eNOS tetap, namun cenderung meningkat. Pola perubahan tersebut adalah mekanisme kompensasi untuk proteksi ROS pada saat periode kehamilan. Namun, diperlukan penelitian lanjutan untuk memperjelas mekanisme dengan memeriksa variabel yang lain.

**Kata kunci:** Glukosa-6-fosfat dehidrogenase, preeklampsia, stres oksidatif, eNOS, F2-isoprostan.

**ABSTRACT**

**ANALYSIS OF ALTERATION PATTERN OF  
GLUCOSE-6-PHOSPHATE DEHYDROGENASE (G6PD)  
ENZYME ACTIVITY, eNOS, AND F2-ISOPROSTANE LEVELS  
IN PREECLAMPSIA PATIENTS IN SURABAYA**

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**Background:** The study aims to analyze the pattern of alteration in G6PD enzyme activity, eNOS, and F2-isoprostane levels in preeclampsia (PE).

**Methods:** There was 140 pregnant women were divided into PE groups (n=70) and non-PE (n=70). Participants' age, gestational age, number of marriages, number of pregnancies, ethnicity, BMI, hemoglobin levels, blood pressure, and proteinuria was collected to determine risk factors for pregnant women. Measurement of G6PD activity, F2-isoprostane and eNOS levels with ELISA.

**Results:** The study showed no significant difference ( $p \geq 0.05$ ) in participants' age, number of marriages, number of pregnancies, and hemoglobin levels between groups. While ethnicity, gestational age, BMI, blood pressure, and proteinuria were significant differences between groups ( $p < 0.05$ ). There was an increase pattern of G6PD enzyme activity and eNOS levels significantly ( $p < 0.05$ ) in PE. However, the decrease pattern of F2-isoprostane levels was not significant ( $p \geq 0.05$ ). Based on the activity of the G6PD enzyme, an increase pattern of eNOS levels was not significant ( $p > 0.05$ ), but the mean levels of eNOS tended to increase. While the activity of the G6PD enzyme against F2-isoprostane levels was a significant decreasing pattern of F2-isoprostane levels ( $p < 0.05$ ).

**Conclusion:** There is an increase pattern of G6PD enzyme activity and eNOS level. Based on G6PD activity, the pattern of F2-isoprostane levels was decrease and eNOS levels was remain but tend to increase. This pattern of change is a compensatory mechanism for ROS protection during the pregnancy period. However, further research is needed to figure out the underlying mechanism with other variables.

**Keywords:** Glucose-6-phosphate dehydrogenase, preeclampsia, oxidative stress, eNOS, F2-isoprostane