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Ekspresi IGF-I, IGFBP-1, Leptin, dan Reseptor Leptin Pada Plasenta Ibu Hamil yang Terinfeksi Plasmodium falciparum di Timika, Papua = Expression of IGF-I, IGFBP-1, Leptin, and Leptin Receptors in the placentae of Plasmodium falciparum-infected pregnant women in Timika, Papua

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Abstrak

Infeksi malaria saat kehamilan telah dilaporkan berasosiasi dengan peningkatan risiko lahirnya bayi berat badan lahir rendah (BBLR, berat badan lahir < 2500 g) di negara-negara endemis malaria, termasuk di Timika, Papua, Indonesia. Infeksi Plasmodium falciparum (P. falciparum) mengakibatkan penumpukkan eritrosit terinfeksi di plasenta, sehingga berkontribusi pada gangguan fungsi plasenta dan terhambatnya petumbuhan janin. Penelitian bertujuan untuk mengetahui pola ekspresi transkrip mRNA yang terlibat dalam aksis insulin-like growth factor (IGF) dan persinyalan leptin yang berperan dalam mengatur fungsi plasenta selama kehamilan. Plasenta ibu hamil terinfeksi malaria falciparum yang melahirkan bayi tunggal sebanyak 55 sampel digunakan untuk isolasi RNA total. RNA hasil isolasi kemudian ditranskripsi balik menjadi complementary DNA (cDNA) dengan reverse transcription polymerase chain reaction (RT PCR), kemudian diukur ekspresinya dengan quantitative real-time PCR (qPCR). Ekspresi IGF-I (r = 0,232, p = 0,089) dan reseptor leptin isoform pendek (OBRa) (r = 0,215, p = 0,115) pada plasenta cenderung berkorelasi positif terhadap skor-z berat badan lahir. Ekspresi OBRa juga berkorelasi negatif secara terhadap umur kehamilan ( = -0,294, p = 0,029). Sedangkan, ekspresi IGFBP-1 cenderung berkorelasi negatif terhadap berat plasenta (r = -0,237, p = 0,081). Ekspresi leptin dan reseptor leptin isoform panjang (OBRb) plasenta menunjukkan korelasi yang lemah terhadap berat badan lahir, skor-z berat badan lahir, berat plasenta, maupun umur kehamilan. Faktor berat plasenta dan ekspresi OBRa menunjukkan kontribusi yang nyata terhadap skor-z berat badan lahir dibandingkan variabel lainnya. Keterkaitan antara ekspresi komponen aksis IGF-I dan persinyalan leptin pada plasenta dari kehamilan terinfeksi malaria menunjukkan respon plasenta terhadap kondisi intrauterin yang merugikan akibat infeksi malaria.
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Malaria infection during pregnancy has been reported to be associated with an increased risk for delivering low birth weight (LBW, birth weight < 2500 g) infants in malaria-endemic area, including in Timika, Papua, Indonesia. Plasmodium falciparum (P. falciparum) infection leads to placental sequestration of infected erythrocytes, causing impaired placental function and altered fetal growth. This study was aimed to investigate the expression pattern of mRNA transcripts involved in insulin-like growth factor (IGF) axis and leptin signaling which play a role in modulating placental function during pregnancy. A total of 55 placenta samples collected from falciparum malaria-infected mothers who delivered singleton infant were employed for total RNA isolation. The isolated RNA was reverse transcribed into complementary DNA (cDNA) using reverse transcription polymerase chain reaction (RT PCR), followed by measurement of gene expression using quantitative real-time PCR (qPCR). Placental expressions of IGF-I (r = 0,232, p = 0,089) and long isoform of leptin receptor (OBRa) (r = 0,215, p = 0,115) were tend to be positively correlated with birth weight z-score. The expression of OBRa was also negatively correlated with gestational age ( = -

0,294, p = 0,029). Meanwhile, the expression of IGFBP-1 showed a tendency to be negatively correlated with placental weight (r = -0,237, p = 0,081). Placental leptin and long isoform of leptin receptor (OBRb) expressions showed weak correlations with birth weight, placental weight, and gestational age. Placental weight and OBRa expression represent a significant contribution to determination of birth weight z-score as compared to the others variables. Correlation between placental expression of IGF axis and leptin signaling in malaria-infected pregnancies might reflect placental response to adverse intrauterine condition due to malaria infection.