

ABSTRACT

EFFECT OF MATERNAL MALARIA ON INFANT SUSCEPTIBILITY TO MALARIA INFECTION DURING FIRST YEAR OF LIFE

Background: Annually, 70% of 125.2 million pregnancies in malaria endemic region occur in Asia-Pacific. Malaria infection during pregnancy is a significant public health problem with substantial risks for pregnant woman, her fetus, and the newborn child.

Objectives: To compare infants born to mother with and without maternal malaria on infant susceptibility to malaria infection, growth and development.

Methods: We conducted a cohort prospective study in Timika Papua from October 2013 to September 2017. Infants were followed for 12 months. Diagnosis of malaria was based on microscopy and PCR and histopathology of placental tissue. Growth, nutritional status and developmental of infants were assessed by anthropometry and Bayley III test. Data were analyzed by SPSS 22 version.

Results: Of 179 eligible subjects, 98 (54.74%) were infants born to mother with maternal malaria and 81 (45.26%) without maternal malaria. At the age of 6 and 12 months, infants born to mothers with maternal malaria were more susceptible to malaria infections compared to infants born to mothers without maternal malaria with $RR=9.09$; 95%CI: 1.19-69.94; $p=0.013$ and $RR=3.86$; 95%CI: 1.15-12.96; $p=0.02$ respectively. Multivariate analysis showed independent risk factors of infant susceptibility to malaria infection during the first year of life was pregnant women who only got 1 time of malaria infection during pregnancy ($RR=2.48$; 95%CI: 1.04-594; $p=0.02$).

Infants born to mothers with maternal malaria are more at risk of malnutrition at age 3, 4, 9 months ($RR = 3.58$; 95% IK: 1.06-12.14; $p = 0.03$; $RR = 6.61$; 95% IK: 1.57-27.32; $p = 0.002$; and $RR = 2.57$; 95% IK: 1.29-5.13; $p = 0.004$) and stunting at age 4 and 9 months ($RR = 5.37$; 95% IK: 1.25-23.12; $p = 0.01$ and $RR = 1.95$; 95% IK: 1.03-3.71; $p = 0.03$). According to a Bayley III examination infants born to mothers with maternal malaria had a lower score 5.5 and 6.26 points on cognitive and motoric abilities than infants born to mothers without maternal malaria and significantly different with $p = 0.00$ and $p=0.02$ respectively.

Conclusions: Infant susceptibility to malaria is associated with maternal malaria status during pregnancy. Pregnant women who only had malaria once were independent risk factors for infant's increased susceptibility to malaria infection. Maternal malaria was associated with nutritional status, stunting, cognitive and motoric abilities on their offspring.

Key words: maternal malaria in pregnancy, infant susceptibility, growth and development

INTISARI

EFEK MALARIA MATERNAL TERHADAP KERENTANAN INFEKSI MALARIA PADA BAYI SELAMA 1 TAHUN PERTAMA KEHIDUPAN

Latar belakang: Lebih kurang 70% dari 125,2 juta ibu hamil di daerah endemis Asia-Pasific terancam malaria. Malaria maternal meningkatkan kesakitan dan kematian pada ibu serta bayinya.

Tujuan: Membandingkan kerentanan bayi terhadap infeksi malaria, pertumbuhan dan perkembangan bayi dari ibu hamil dengan malaria maternal dan bayi dari ibu hamil tanpa malaria maternal.

Metode: Penelitian kohort prospektif terhadap bayi selama 12 bulan sejak lahir di Timika Papua mulai Oktober 2013 sampai September 2017. Diagnosis malaria berdasarkan pemeriksaan mikroskopis dan PCR serta pemeriksaan histologi pada jaringan plasenta. Pertumbuhan dan status gizi berdasarkan antropometri, Perkembangan berdasarkan tes *Bayley III*. Data dianalisis dengan SPSS versi 22.

Hasil: Dari 179 bayi didapatkan 98 (54,74%) bayi dari ibu dengan malaria maternal dan 81 (45,26%) tanpa malaria maternal. Rerata umur ibu $24,8 \pm 5,78$ vs $26,2 \pm 5,95$ tahun. Pada usia 6 dan 12 bulan, bayi dari ibu dengan malaria maternal lebih rentan terinfeksi malaria dengan $RR=9,09$; 95%IK: 1,19-69,94; $p=0,013$ dan $RR=3,86$; 95%IK: 1,15-12,96; $p=0,02$. Analisis multivariat menunjukkan faktor ibu terinfeksi malaria 1 kali selama hamil merupakan faktor independen yang berhubungan dengan kerentanan bayi terhadap infeksi malaria dengan $RR=2,48$; 95%IK: 1,04-5,94; $p=0,02$). Bayi dari ibu dengan malaria maternal lebih berisiko mengalami gizi buruk/kurang pada usia 3, 4, 9 bulan ($RR=3,58$; 95%IK: 1,06-12,14; $p=0,03$; $RR=6,61$; 95%IK: 1,57-27,32; $p=1,002$; $RR=2,57$; 95%IK: 1,29-5,13; $p=0,004$) serta *stunting* pada usia 4 dan 9 bulan ($RR=5,37$; 95%IK: 1,25-23,12; $p=0,01$ dan $RR=1,95$; 95%IK: 1,03-3,71; $p=0,03$). Pada pemeriksaan *Bayley III*, skor kognitif dan motorik bayi dari ibu dengan malaria maternal lebih rendah 5,5 dan 6,26 poin dibandingkan dengan bayi dari ibu tanpa malaria maternal, dan berbeda bermakna ($p=0,00$ dan $p=0,02$).

Simpulan: Kerentanan bayi terhadap malaria berhubungan dengan status malaria maternal selama kehamilan. Ibu hamil terinfeksi malaria 1 kali merupakan faktor independen pada peningkatan kerentanan bayi terhadap infeksi malaria. Malaria maternal berhubungan dengan status gizi dan *stunting* serta perkembangan kognitif dan motorik bayinya.

Kata kunci: malaria maternal, kerentanan bayi, pertumbuhan dan perkembangan bayi.