

Hubungan Infeksi Cacing Tambang (Pemeriksaan Molekuler) dengan Kejadian Anemia pada Anak Balita di Kabupaten Mimika Provinsi Papua

INTISARI

Latar belakang : Anemia merupakan masalah kesehatan penting di daerah endemis malaria, termasuk Papua (Indonesia). Di lain pihak, infeksi kecacingan, termasuk cacing tambang (*hookworm*) sering juga ditemukan di daerah endemis malaria. Data mengenai infeksi *hookworm* (*Necator americanus* dan *Ancylostoma duodenale*) dan kontribusinya terhadap kejadian anemia di Papua masih sangat terbatas. Penelitian ini memberikan informasi untuk pertama kali proporsi spesies *hookworm* dan dampaknya terhadap kejadian anemia di daerah endemis malaria di Timika, Papua.

Metode : Penelitian ini merupakan penelitian deskriptif analitik dengan rancangan penelitian *cross sectional*. Subjek penelitian adalah sampel feses yang diperoleh dari anak balita di Kabupaten Mimika Provinsi Papua. Sampel tersebut diperoleh dari hasil Survei Rumah Tangga Kabupaten Mimika tahun 2013, yang telah disimpan pada suhu -80°C . Total sampel yang digunakan berjumlah 182 sampel dengan data sekunder lengkap, dan telah diperiksa secara mikroskopik dengan metode *Kato-Katz*. Pemeriksaan molekuler untuk deteksi *N.americanus* dan *A. duodenale* dilakukan dengan metode *real time* PCR. Analisis data menggunakan analisis statistik univariat, bivariat dan multivariat dengan uji *chi-square* dan regresi logistik dengan tingkat kemaknaan $P < 0,05$ dengan tingkat kepercayaan 95% CI.

Hasil : Proporsi anemia 17,6% pada anak balita yang sampel fesesnya diperiksa secara molekuler. Tidak ada anak yang termasuk dalam kategori anemia berat, 29 anak (15,9%) memiliki anemia pada kategori anemia ringan dan 3 anak (1,6%) adalah anemia sedang. Berdasarkan metode *real time* PCR, proporsi *Necator americanus* dan *Ancylostoma duodenale* adalah sebesar 13,7%, dan 51,1%. Jumlah infeksi campuran atau ganda (*Necator americanus* dan *Ancylostoma duodenale*) hanya sebesar 9,9%. Terdapat hubungan yang bermakna antara infeksi malaria, *severe stunting* dengan kejadian anemia ($p=0,011$; OR=4,62; 95%CI 1,42-15,05 dan $p=0,034$; OR=2,81; 95%CI 1,08-7,32). Infeksi *hookworm* tidak berhubungan signifikan dengan kejadian anemia pada anak balita di Mimika.

Kesimpulan : Risiko terkena infeksi *hookworm* di Timika, dimulai sejak 1 tahun pertama kehidupan. Koinfeksi antara *hookworm* dan malaria pada anak balita meningkatkan risiko terjadinya anemia dibandingkan dengan infeksi tunggal malaria

Kata kunci: Infeksi *hookworm*, *real time* PCR, anak balita, anemia, Papua.

Relationship between Hookworm Infection (Molecular Examination) with Anemia in Children under 5 Years Old in Mimika District Papua Province

ABSTRACT

Background: Anemia is an important health problem in malaria endemic areas, including Papua (Indonesia). On the other hand, helminthiasis infections, including hookworms are often found in malaria endemic areas. Data on hookworm infection (*Necator americanus* and *Ancylostoma duodenale*) and its contribution to the incidence of anemia in Papua are still very limited. This study provides information for the first time the proportion of hookworm species and its impact on the incidence of anemia in malaria-endemic areas in Timika, Papua.

Methods: This was a descriptive analytic study using a cross-sectional design. The subject was faecal sample obtained from children aged less than 5 years that was collected based on 2013 Household Survey in Mimika District, and stored at -80 °C. There were 182 feces samples with complete secondary data, that examined microscopically by Kato-Katz method. Molecular examination for *N. americanus* and *A. duodenale* detection was carried out by real-time PCR method. Data were analyzed using univariate, bivariate, and multivariate statistical analysis with chi-square and logistic regression with a significance level of <0.05 and 95% confidence interval (95%CI).

Results: The proportion of anemia was 17.6% in children aged less than 5 years in Mimika District, whose stool samples were examined molecularly. No children belong to severe anemia category, 29 children (15.9%) had anemia at mild anemia category and 3 children (1.6%) were moderate anemia. Based on the real-time PCR method, the proportion of *Necator americanus* and *Ancylostoma duodenale* were 13.7%, and 51.1% respectively. The number of multiple infections (*Necator americanus* and *Ancylostoma duodenale*) was only 9.9%. There is significant relationship between malaria infection and severe stunting with anemia ($p=0,011$; OR=4.62; 95%CI 1.42-15.05 dan $p=0,034$; OR=2.81; 95%CI 1.08-7.32). Hookworm infection was not significantly associated with anemia in children under 5 years old in Mimika.

Conclusion: The risk of getting hookworm infection in Timika is started from the early life. Coinfection between hookworm and malaria in children under 5 years increased the risk of anemia compared to single malaria infection.

Keywords: Hookworm infection, real-time PCR, children aged under 5 years old, anaemia, Papua.