

**HUBUNGAN POLIMORFISME GEN INTERLEUKIN-10, EOSINOFIL,
INTENSITAS INFEKSI, DAN KADAR INTERLEUKIN-10
DENGAN KADAR KOLESTEROL DAN GLUKOSA DARAH
PADA INFEKSI *GEOHELMINTH***

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ABSTRAK

Latar Belakang. *Geohelminth* merupakan cacing penyebab tersering dari infeksi kronis pada usus manusia. Cacing ternyata memberikan efek protektif terhadap beberapa penyakit, termasuk sindroma metabolik. Hal tersebut berhubungan dengan kemampuan cacing memodulasi respon imun host melalui Th2. Interleukin 10 (IL-10) merupakan sitokin anti inflamasi diperkirakan berhubungan dengan penurunan kadar glukosa dan kadar kolesterol darah pada individu yang terinfeksi *geohelminth*. Kadar IL-10 dipengaruhi oleh gen penyandi yang terletak pada regio promotor. Dengan adanya polimorfisme gen IL-10 tentu akan berpengaruh pada kadar IL-10 yang juga berpengaruh terhadap kadar kolesterol dan glukosa darah pada infeksi *geohelminth*. Penelitian ini bertujuan melihat hubungan kadar IL-10 sirkulasi dengan kadar kolesterol total dan glukosa darah pada individu yang terinfeksi *geohelminth* serta melihat pengaruh polimorfisme gen IL-10 dengan variabel tersebut.

Metode. Pemeriksaan feses untuk deteksi *geohelminth* dikerjakan dengan metode langsung menggunakan iodine, dan untuk mengukur jumlah telur per gram tinja dilakukan dengan metode Kato Katz. Polimorfisme Gen IL-10 diperiksa dengan PCR dan sekuensing untuk mendeteksi SNP pada rs1800896, rs1800871, rs1800872, 3024496, 3024498. Kadar IL-10 diukur dengan metode *indirect enzyme-linked immunosorbent assays* (ELISA). Kadar kolesterol total plasma diperiksa dengan metode CHOD-PAP, dan kadar glukosa darah puasa diukur menggunakan metode *hexokinase*.

Hasil. Semua subjek penelitian yang terinfeksi *geohelminth* pada penelitian ini tergolong infeksi ringan. Tidak ada hubungan antara polimorfisme Gen IL-10 dengan kejadian infeksi *geohelminth* ($p>0,05$). Terdapat hubungan yang bermakna antara SNP -1082 G/A (rs1800896) dengan kadar IL-10 ($p<0,05$). Tidak terdapat hubungan yang bermakna antara SNP pada rs1800871, rs1800872, 3024496, 3024498 dengan kejadian infeksi *geohelminth* (masing-masing $p>0,05$) dan antara SNP pada empat marker tersebut dengan kadar IL-10 ($p>0,05$). Terdapat peningkatan bermakna kadar IL-10 pada individu yang terinfeksi *geohelminth* bila dibandingkan kontrol ($p<0,05$). Terdapat penurunan bermakna kadar kolesterol total dan kadar glukosa darah puasa pada individu yang terinfeksi *geohelminth* dibandingkan kontrol (masing-masing $p<0,05$). Tidak terdapat korelasi antara jumlah telur/gram tinja dengan kadar IL-10 ($p>0,05$), namun terdapat korelasi negatif antara jumlah telur dengan kadar kolesterol total. Terdapat korelasi negatif antara kadar IL-10 dengan kadar kolesterol total ($p<0,05$) dan antara kadar IL-10 dengan kadar glukosa darah puasa ($p<0,05$).

Kesimpulan. Terdapat korelasi negatif antara IL-10, TC, dan FBG memperkuat dukungan terhadap peran Th2, khususnya IL-10 terhadap rendahnya kadar kolesterol dan glukosa darah pada infeksi *geohelminth*. Meskipun SNP -1082 G/A berpengaruh terhadap kadar IL-10, namun tidak berhubungan dengan kadar kolesterol dan glukosa darah.

Kata Kunci: *Geohelminth*, Polimorfisme Gen IL-10, Eosinofil, IL-10, Kolesterol, Glukosa

THE RELATIONSHIP BETWEEN GENE INTERLEUKIN-10 POLYMORPHISM, EOSINOPHIL, INTENSITY OF INFECTION WITH BLOOD CHOLESTEROL AND BLOOD GLUCOSE LEVELS IN *GEOHELMINTH* INFECTION

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ABSTRACT

Geohelminth are a common cause of chronic infections in humans. worm infections have been shown to have a protective effect against some diseases. There are related to the ability of the worm to modulate the host immune response through Th2. IL-10 is anti inflammatory cytokine which is predicted to be related to degradation of blood cholesterol and glucose levels in infected subject. IL-10 levels are affected by IL-10 gene which are located in promotor region. The aim of this study is to investigate the correlation between IL-10 levels and blood cholesterol and glucose in geohelminth positive human subjects and also to determinate the effect of polymorphism of IL-10 gene.

Stool examination for geohelminth was done by direct method using iodine and by Kato Katz method. Polymorphism of IL-10 gene was examine by using PCR and sequencing was used to detect SNP in rs1800896, rs1800871 rs1800872, rs3024496, rs3024498. IL-10 levels were measured by indirect enzyme-linked immunosorbent assays (ELISA) method. Total plasma cholesterol levels were examined by CHOD-PAP method, and fasting blood glucose was measured using hexokinase method.

All subjects infected with geohelminth in this study classified as a mild infection. There was no association between the IL-10 gene polymorphism with the incidence of geohelminth infection ($p>0.05$). There was a significant relationship between G allele in rs1800896 with elevated levels of IL-10 ($p<0.05$). There was a significant increase in IL-10 levels in geohelminth-infected individuals compared to controls ($p<0.05$). There was a significant decrease in total cholesterol and fasting blood glucose levels in geohelminth-infected individuals compared with controls ($p<0.05$). There was no correlation between the intensity of infection with IL-10 levels ($p>0.05$), but there was a negative correlation between the intensity of infection and total cholesterol levels ($p<0,05$). There was a negative correlation between IL-10 and total cholesterol ($p<0.05$) and fasting glucose levels ($p<0.05$).

From this study it was concluded that there was a role of SNP gene IL-10 in rs1800896 to elevated levels of IL-10 in individuals infected with geohelminth. The presence of a negative correlation between IL-10 and cholesterol and fasting glucose further strengthens support for the role of Th2 especially IL-10 to low cholesterol and blood glucose levels in geohelminth infections

Key word: Geohelminth, Polymorphism of IL-10, IL-10, total cholesterol, blood glucose