Hubungan Antara Variasi Genetik Dan Kadar Protein Serum Matrix Metalloproteinase Dengan Gambaran Kavitas Dan Fibrosis Paru Pasien Tuberkulosis Multi-Drug Resistance Menggunakan High Resolution Computerized Tomography Toraks = Correlation between Genetic Variation and serum protein levels Matrix Metalloproteinase with Cavity and Lung Fibrosis Images in Multi-Drug Resistance Tuberculosis Patients Using High-Resolution Computerized Tomography of the thorax

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Abstrak

Latar belakang: Matrix metalloproteinases (MMPs) merupakan protein yang berperan dalam proses inflamasi dan remodeling yang disebabkan oleh infeksi, termasuk tuberkulosis paru (TB), terutama multidrug resistance. Penelitian ini bertujuan untuk mengkorelasikan hubungan antara kadar serum dan polimorfisme MMP-1 dan MMP-9 dengan karakteristik kavitas, seperti jumlah, diameter, ketebalan dinding, dan distribusi fibrosis pada Multidrug-Resistant (MDR) dan Drug-Sensitive (DS) pasien TB.
Metode: Penelitian ini menggunakan desain studi potong lintang komparatif. Subyek yang berasal dari pasien rawat jalan RS Abdoel Moelok Lampung Indonesia telah lulus uji etik. Subjek dibagi menjadi dua kelompok, 34 subjek pada kelompok MDR-TB dan 36 subjek pada kelompok DS-TB. Kadar protein serum MMP-1 dan MMP-9 dilakuakn dengan uji ELISA, dan genotipe MMP-1 dan MMP-9 dengan Sequencing metode Sanger. Kemudian kavitas dan fibrosis dievaluasi dengan menggunakan pemeriksaan High-Resolution Computerized Tomography (HRCT) toraks.
Hasil: Terdapat perbedaan bermakna jumlah kavitas dengan diameter lebih dari 6, 6 mm, dan tebal kavitas pada pasien TB-MDR dibandingkan dengan pasien TB-DS. Distribusi fibrosis pada segmen paru juga berbeda nyata pada MDR-TB dibandingkan dengan DS-TB. Walaupun kadar MMP-9 pada kelompok MDR-TB lebih tinggi dibandingkan dengan kelompok DS-TB, namun secara statistik tidak terdapat perbedaan yang signifikan dari penelitian yang menunjukkan bahwa terdapat hubungan antara MDR-TB dan DS-TB mengenai jumlah kavitas, diameter kavitas, ketebalan dinding kavitas, serta distribusi fibrosis di segmen paru-paru yang terkena yang dievaluasi dengan HRCT. Penelitian ini mendapatkan frekuensi alel G pada MMP-1 pada populasi Indonesia (Asia) dan adanya hubungan yang signifikan dengan tebal kavitas dengan alel G pada MMP-1 dan alel T pada MMP-9 alel
Kesimpulan: Tidak terdapat hubungan antara genotipe MMP-1 (-1607G) dan MMP-9 (C1562T) dengan kadar serum MMP-1 dan MMP-9, genotipe MMP 1 pada kedua kelompok penelitian berbeda secara bermakna dan merupakan faktor pencegahan dua kali lipat kejadian MDR-TB. Selain itu, terdapat perbedaan yang substansial dalam ketebalan dinding kavitas antara genotipe G/G MMP-1 1607 T/T MMP-9 pada kedua kelompok penelitian.
.....Background: Matrix metalloproteinases (MMPs) are proteins that play a role in the inflammatory and remodeling processes caused by infections, including pulmonary tuberculosis (TB), especially multidrug resistance. This study aims to correlate the relationship between serum levels and polymorphism of MMP-1 and MMP-9 with cavity characteristics, such as number, diameter, wall thickness, and distribution of

fibrosis in Multidrug-Resistant (MDR)- and Drug-Sensitive (DS)-TB patients.
Method: This study used a comparative cross-sectional study design. The subjects came from outpatients at Abdoel Moelok Hospital, Lampung Indonesia had passed the ethical test. Subjects were divided into two groups, 34 subjects in the MDR-TB group and 36 subjects in the DS-TB group. The levels of MMP-1 and MMP-9 were carried out by ELISA test, and the genotipes MMP-1 and MMP-9 were determined using PCR-the Sequencing method. In addition, cavities and fibrosis were measured using thoracic High-Resolution Computerized Tomography (HRCT) imaging.
Results: There was a significant difference in the number of cavities with a diameter of more than 6.6 mm, and cavity thickness in MDR-TB patients compared to DS-TB patients. The distribution of fibrosis in the lung segments was also significantly different in MDR-TB compared to DS-TB. Although MMP-9 levels in the MDR-TB group were higher than in the DS-TB group, there was no statistically significant difference from the study, which showed a relationship between MDR-TB and DS-TB regarding the number of cavities, cavity diameter, walls thickness cavity, as well as the distribution of fibrosis in the affected lung segments evaluated by HRCT. This study found the frequency of the G allele in MMP-1 in the Indonesian population (Asia) and a significant relationship with cavity thickness between the G allele in MMP-1 and the T allele in MMP-9.
Conclusion: There is no relationship between the MMP-1 (-1607G) and MMP-9 (C1562T) genotypes with serum levels of MMP-1 and MMP-9, the MMP 1 genotype in the two study groups was significantly different and was a factor preventing twice the incidence MDR-TB. In addition, the two study groups showed substantial differences in cavity wall thickness between the G/G MMP-1 1607 T/T MMP-9 genotypes.