



**PERBEDAAN KADAR HEPARANASE PADA PASIEN KANKER PARU YANG  
TERDIAGNOSIS TROMBOSIS VENA DALAM DENGAN  
KANKER PARU YANG TIDAK TROMBOSIS VENA DALAM  
DI RSUP DR. M. DJAMIL PADANG**

**TESIS**

**Diajukan Sebagai Salah Satu Syarat Memperoleh Gelar Spesialis Ilmu  
Penyakit Jantung dan Pembuluh Darah**

**dr. ANNA PRIMA SARI**

**1850311207**

**PROGRAM STUDI JANTUNG DAN PEMBULUH DARAH  
PROGRAM SPESIALIS  
FAKULTAS KEDOKTERAN UNIVERSITAS ANDALAS  
RSUP DR. M. DJAMIL PADANG**

**2023**

## ABSTRAK

Nama : Anna Prima Sari  
Program Studi : Program Jantung dan Pembuluh Darah Program Spesialis  
Judul : Perbedaan Kadar Heparanase Pada Pasien Kanker Paru Terdiagnosis Trombosis Vena Dalam dengan Kanker Paru yang Tidak Trombosis Vena Dalam di RSUP Dr. M. Djamil Padang

**Latar Belakang:** Heparanase adalah enzim  $\beta$ -D-*endoglucuronidase* yang mendegradasi heparan sulfat. Aktivitas heparanase terlibat dalam pertumbuhan sel tumor, aktivitas peradangan, remodeling jaringan, angiogenesis dan invasi sel. Peningkatan aktivitas prokoagulan heparanase dapat diamati salah satunya kanker. Semua keganasan sangat berkorelasi dengan risiko tinggi trombosis dan status hiperkoagulabilitas.

**Metode Penelitian:** Penelitian ini adalah penelitian analitik *cross-sectional* terhadap pasien kanker paru yang menjalani pemeriksaan doppler vaskular pada IPJT RSUP M. Djamil Padang dari Januari hingga Juni 2023. Pemeriksaan kadar heparanase dinilai dari pembuluh darah vena yang diperiksa di Laboratorium Biomedik FK UNAND. Setelah dilakukan uji normalitas, dilakukan uji bivariat non-parametrik dengan Mann-Whitney *test*. Selanjutnya dilakukan analisis lanjutan diagnostik untuk melihat nilai *cut-off point* kadar heparanase dengan prosedur *Receiver Operating Curve* (ROC).

**Hasil Penelitian:** Berdasarkan analisis statistik, nilai median kadar heparanase dengan nilai 3,598 ng/ml (2,009 ng/ml- 12,561 ng/ml) pada kelompok pasien kanker paru yang TVD, sedangkan nilai median kadar heparanase pada kelompok pasien kanker paru tidak TVD didapatkan nilai 2,470 ng/ml (1,480 ng/ml-10,443 ng/ml), nilai ini menunjukkan perbedaan yang signifikan kadar heparanase pada kelompok kanker paru yang TVD dibandingkan dengan kelompok kanker paru tidak TVD dan bermakna secara statistik dengan nilai p value 0.033 ( $p < 0.05$ ). Kadar heparanase sebesar 2,786 ng/ml dapat menjadi prediktor kejadian TVD pada pasien kanker paru dengan sensitivitas dan spesifisitas yang baik, masing- masing 71,4% dan 67,7% dan nilai AUC yang baik, yaitu 69.1% ( $p = 0,033$ ).

**Kesimpulan:** Kadar heparanase kelompok kanker paru yang TVD lebih tinggi daripada pasien paru tidak TVD dan bermakna secara statistik dengan nilai p value 0.033 ( $p < 0.05$ ). Kadar heparanase sebesar 2,786 ng/ml dapat menjadi prediktor kejadian TVD pada pasien kanker paru dengan sensitivitas dan spesifisitas yang baik, masing- masing 71,4% dan 67,7% dan nilai AUC yang baik, yaitu 69.1% ( $p = 0,033$ ).

**Kata kunci:** Heparanase, Kanker paru, TVD, Doppler Vaskular

## ABSTRACT

Name : Anna Prima Sari  
Study Program : Cardiology Program and Vascular Medicine Specialist Program  
Title : Differences in Heparanase Levels in Lung Cancer Patients Diagnosed with Deep Vein Thrombosis (DVT) versus non-DVT Lung Cancer at Dr. M. Djamil Padang General Hospital

**Background:** Heparanase was an enzyme of the  $\beta$ -D-endoglucuronidase type that degraded heparan sulfate. Its activity had implications in the growth of tumor cells, inflammatory responses, tissue remodeling, angiogenesis, and the invasion of cells. Elevated levels of procoagulant heparanase activity were evident in various conditions, including cancer. Malignancies, in general, exhibited a strong correlation with an increased susceptibility to thrombosis and a hypercoagulable state.

**Research Method:** A cross-sectional analytical study was conducted on patients with lung cancer who had undergone vascular Doppler examinations at the IPJT of RSUP M. Djamil Padang between January and June 2023. The levels of heparanase were evaluated in venous blood samples collected from the examined vessels at the Biomedical Laboratory of FK UNAND. Following a normality assessment, non-parametric bivariate testing was carried out using the Mann-Whitney test. Subsequent diagnostic analyses were performed to establish the cutoff point for heparanase levels using the Receiver Operating Characteristic (ROC) procedure.

**Research Results:** The statistical analysis revealed that the median heparanase levels were 3.598 ng/ml (range: 2.009 ng/ml - 12.561 ng/ml) in the group of lung cancer patients with Vascular Thrombotic Disease (TVD). In contrast, the median heparanase levels in the lung cancer group without TVD were 2.470 ng/ml (range: 1.480 ng/ml - 10.443 ng/ml). This observation pointed to a significant disparity in heparanase levels between the lung cancer patients with and without TVD, with a statistically significant p-value of 0.033 ( $p < 0.05$ ). An optimal heparanase level of 2.786 ng/ml emerged as a predictor for TVD occurrence in lung cancer patients, demonstrating a robust sensitivity of 71.4%, specificity of 67.7%, and a commendable AUC value of 69.1% ( $p = 0.033$ ).

**Conclusion:** The research findings highlighted that heparanase levels were notably higher in the lung cancer group with TVD compared to those without TVD, underscoring statistical significance with a p-value of 0.033 ( $p < 0.05$ ). Furthermore, an optimal heparanase level of 2.786 ng/ml exhibited the capability to predict the development of TVD in lung cancer patients, boasting favorable sensitivity and specificity rates of 71.4% and 67.7% respectively, alongside a substantial AUC value of 69.1% ( $p = 0.033$ ).

**Keywords:** Heparanase, Lung cancer, Vascular Thrombotic Disease (TVD), Vascular Doppler