INTISARI

ANALISIS FAKTOR-FAKTOR DETERMINAN DIAGNOSTIK EFUSI PLEURA TUBERKULOSIS

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Latar Belakang : IDSA merekomendasikan penggunaan uji ADA untuk mendiagnosis efusi pleura TB dengan *cut off* ≥ 40 U/L sebagai indikator memulai terapi obat anti tuberkulosis. Di Indonesia, penegakan diagnosis efusi pleura TB menggunakan uji ADA masih belum dapat dilaksanakan secara menyeluruh karena biaya yang tinggi dan ketersediaan yang masih terbatas di kota besar. Kondisi tersebut menjadi tantangan bagaimana menciptakan suatu alat diagnostik yang lebih murah dan tersedia di daerah namun memiliki kemampuan diagnosis yang sama baiknya dengan uji ADA.

Tujuan : Penelitian ini bertujuan untuk mencari faktor-faktor determinan diagnostik efusi pleura tuberkulosis dan membuat sistem skoring untuk penegakan diagnosis menggunakan faktor-faktor determinan diagnostik tersebut.

Metode : Penelitian ini menggunakan metode penelitian cross sectional, data diambil dari rekam medis pasien efusi pleura tuberkulosis yang dirawat di RSUP Dr. Sardjito pada periode 2022 hingga 2024. Uji bivariat dianalisis dengan uji chi-square, variabel yang bermakna ($p < 0.25$) dilanjutkan dalam analisis multivariat dengan uji regresi logistik. Kemampuan prediksi skor efusi pleura tuberkulosis dinilai dengan menentukan *area under reciever operating characteristic curve* (ROC).

Hasil : Sebanyak 210 subyek penelitian, 64 subyek dengan efusi pleura tuberkulosis dan 146 subyek dengan efusi pleura non tuberkulosis. Analisis bivariat dilakukan pada 15 variabel yaitu usia, jenis kelamin, demam, nyeri dada pleuritik, penurunan berat badan, riwayat tuberkulosis, riwayat diabetes, kelainan parenkim paru, volume efusi pleura, warna, glukosa, protein, LDH, limfosit predominan dan uji rivalta. Variabel yang bermakna kemudian dimasukan kedalam analisis multivariat dan didapatkan 5 variabel yang bermakna yaitu nyeri dada pleuritik dengan nilai $p = 0.001$ (OR = 21.93), glukosa cairan pluera < 89.45 mg/dl dengan

nilai p = 0.001 (OR = 49.78), protein cairan pleura ≥ 3.57gr/dl dengan nilai p = 0.001 (OR = 23.32), LDH cairan pleura ≥ 378.5 U/L dengan nilai p = 0.001 (OR = 49.78), rivalta positif dengan nilai p = 0.001 (OR = 25.79). Pada saat dilakukan uji Hosmer dan Lemeshow, didapatkan nilai p = 0.839. Pada saat dilakukan analisa kurva ROC, didapatkan AUC sebesar 0.988 (95% CI = 0.98 – 0.99). *Cut off* skor efusi pleura tuberkulosis adalah 3 dengan sensitivitas 92.2% dan spesifisitas 96.6%.

Kesimpulan : Didapatkan lima determinan diagnostik yang bermakna untuk mendiagnosis efusi pleura tuberkulosis yang kemudian dibuat menjadi sistem skoring. Bobot untuk masing-masing determinan adalah : 1 untuk nyeri dada pleuritik, glukosa cairan pleura < 89.45 mg/dl, protein cairan pleura ≥ 3.57 gr/dl, LDH cairan pleura ≥378.5 U/L, dan uji rivalta cairan pleura positif. Apabila didapatkan skor ≥3 dari lima determinan tersebut, maka subyek tersebut diprediksi mengalami efusi pleura tuberkulosis.

Kata Kunci : Efusi pleura tuberkulosis, sistem skoring, uji ADA

ABSTRACT
ANALYSIS OF DETERMINANT FACTORS IN THE DIAGNOSIS OF TUBERCULOUS PLEURAL EFFUSION

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Background: IDSA recommends the use of the ADA test to diagnose tuberculous pleural effusion, with a cut-off of ≥ 40 U/L as an indicator to initiate anti-tuberculosis treatment. In Indonesia, establishing the diagnosis of tuberculosis pleural effusion using the ADA test is still not fully feasible due to its high cost and limited availability, which is mainly restricted to major cities. This condition presents a challenge to develop a diagnostic tool that is more affordable and accessible in rural areas while providing diagnostic accuracy comparable to the ADA test.

Objective: This study aims to identify the determinant factors in the diagnosis of tuberculosis pleural effusion and develop a scoring system for diagnosis based on these diagnostic determinant factors.

Methods This study used a cross-sectional research method, with data collected from the medical records of tuberculosis pleural effusion patients treated at Dr. Sardjito General Hospital during the period of 2022 to 2024. Bivariate analysis was conducted using the chi-square test, and variables with significance ($p < 0.25$) in the bivariate analysis were included in the multivariate analysis using logistic regression. The assessment was based on the significant variables identified in the multivariate analysis. The predictive ability of the tuberculosis pleural effusion scoring system was evaluated by determining the area under the receiver operating characteristic curve (AUC) and its 95% confidence interval. The predictive ability of tuberculosis pleural effusion was considered good if the AUC exceeded 0.70.

Results: A total of 210 study subjects were included, consisting of 64 subjects with tuberculosis pleural effusion and 146 subjects with non-tuberculosis pleural effusion. Bivariate analysis was conducted on 15 variables: age, gender, fever, pleuritic chest pain, weight loss, history of tuberculosis, history of diabetes, pulmonary parenchymal abnormalities, pleural effusion volume, color, glucose, protein, LDH, lymphocyte predominance, and rivalta test. Significant variables

were then included in the multivariate analysis, resulting in 5 significant variables: pleuritic chest pain (p = 0.001, OR = 21.93), pleural fluid glucose < 89.45 mg/dL (p = 0.001, OR = 49.78), pleural fluid protein ≥ 3.57 g/dL (p = 0.001, OR = 23.32), pleural fluid LDH ≥ 378.5 U/L (p = 0.001, OR = 49.78), and a positive Rivalta test (p = 0.001, OR = 25.79). The Hosmer and Lemeshow test yielded a p-value of 0.839. ROC curve analysis showed an AUC of 0.988 (95% CI = 0.98–0.99). The cutoff score for tuberculosis pleural effusion was 3, with a sensitivity of 92.2% and a specificity of 96.6%.

Conclusion: Five significant diagnostic determinants for diagnosing tuberculosis pleural effusion were identified and subsequently used to develop a scoring system. The weights assigned to each determinant are as follows: 1 point each for pleuritic chest pain, pleural fluid glucose < 89.45 mg/dL, pleural fluid protein ≥ 3.57 g/dL, pleural fluid LDH ≥ 378.5 U/L, and a positive pleural fluid rivalta test. If a score of ≥3 is obtained from these five determinants, the subject is predicted to have tuberculosis pleural effusion.

Keywords: Tuberculosis pleural effusion, scoring system, ADA test