Peran Pencitraan Bronkoskopi Gelombang Cahaya Spektrum Sempit dalam Menilai Kelainan Morfologis Sel Trakeobronkial Pada Kanker Paru Dan Hubungannya Dengan Mutasi Gen P53 = The Role of Narrow-Band Imaging Bronchoscopy in Assessing Tracheobronchial Cell Morphological Abnormalities in Lung Cancer and Its Relationship with p53 Gene Mutations

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Abstrak

Kanker paru memiliki mortalitas tinggi dan sering terdiagnosis pada stage lanjut. Kelainan morfologis sel trakeobronkial dan biomolekuler mendahului proses karsinogenesis. Bronkoskopi gelombang cahaya spektrum sempit (GCSS) dikembangkan untuk meningkatkan akurasi diagnostik. Tujuan penelitian ini adalah untuk mengetahui akurasi diagnostik bronkoskopi GCSS dalam mendeteksi kelainan morfologis sel trakeobronkial dan hubungannya dengan mutasi gen p53.

Studi ini merupakan studi diagnostik eksperimental yang dilakukan pada subjek kanker paru yang menjalani prosedur bronkoskopi di RS Persahabatan periode Januari-November 2023. Prosedur bronkoskopi GCSS dan biopsi forseps bronkus dilakukan di lesi non-tumor, dilanjutkan dengan pemeriksaan histopatologi hematoksilin dan eosin (HE), serta pemeriksaan Polymerase Chain Reaction (PCR) sekuensing sanger mutasi p53 pada titik R175L, R248W, dan R273C. Analisis kesesuaian juga dilakukan.

Sebanyak 105 subjek diikutsertakan dalam analisis penelitian, dengan dominasi laki-laki, perokok, jenis kanker adenokarsinoma dan stage lanjut. Kelainan morfologis sel trakeobronkial ditemukan pada 34 subjek (32,4%) berupa metaplasi, sel atipik dan sel tumor. Mutasi p53 wild type pada titik R175L, R248W, dan R273C ditemukan pada seluruh jaringan biopsi. Satu jaringan metaplasi dengan mutasi p53 Kodon 267 heterozigot CT dan satu jaringan hiperplasi dengan mutasi p53 Kodon 180 heterozigot GC. Pola vaskular berliku didapatkan sebagai kriteria diagnostik paling baik dibandingkan dengan pola vaskular lainnya dengan area under the curve (AUC) 78,4%; sensitivitas 79,41%; spesifisitas 77,46%; nilai prediktif positif 62,8% dan nilai prediktif negatif 88,7%. Kesesuaian antar pengamat dalam menilai pola vaskular GCSS cukup baik dengan nilai kappa 0,88 (standar eror 0,06; nilai p <0,01). Mukosa edematosa berhubungan dengan pola vaskular berliku pada bronkoskopi GCSS dengan OR 3,6 (IK95% 1,53-8,46; nilai p <0,01). Subjek dengan pola vaskular berliku [OR 21,89 (IK95% 6,50-73,71; nilai p<0,01)] dan subjek dengan IB ^{3} 600 [OR 5,39 (IK95% 1,62-17,71; nilai p 0,01)] berhubungan dengan kelainan morfologis sel trakeobronkial.

.....Lung cancer has high mortality and is often diagnosed at an advanced stage. Additionally, morphological abnormalities of tracheobronchial cells precede the carcinogenesis process and are based on molecular abnormalities. Moreover, Narrow-Band Imaging Bronchoscopy (NBI) has been developed to improve diagnostic accuracy. The objective of this study is to determine the diagnostic accuracy of NBI bronchoscopy in detecting morphological abnormalities of tracheobronchial cells and their relationship with p53 gene mutations.

This study is an experimental diagnostic study conducted on lung cancer subjects undergoing bronchoscopy

procedures at RS Persahabatan from January to November 2023. NBI bronchoscopy procedures and bronchial forceps biopsies were performed on non-tumor lesions, followed by haematoxylin and eosin (HE) histopathological examination, as well as Polymerase Chain Reaction (PCR) Sanger sequencing for p53 mutations at the R175L, R248W, and R273C points. Reliability analysis was also performed.

A total of 105 subjects were included in the study analysis, predominantly male, smokers, with adenocarcinoma type cancer and advanced stage. Tracheobronchial cell morphological abnormalities were found in 34 subjects (32.4%), in the form of metaplasia, atypical cells, and tumor cells. Wild type p53 mutations at the R175L, R248W, and R273C points were found in all biopsy tissues. One metaplastic tissue had a p53 Codon 267 CT heterozygous mutation and one hyperplastic tissue had a p53 Codon 180 GC heterozygous mutation. The tortuous vascular pattern was identified as the best diagnostic criteria compared to other patterns with an area under the curve (AUC) of 78.4%; sensitivity 79.41%; specificity 77.46%; positive predictive value 62.8% and negative predictive value 88.7%. Inter-observer agreement in assessing vascular patterns was good with a kappa value of 0.88 (standard error 0.06; p-value <0.01). Edematous mucosa was associated with a tortuous vascular pattern on NBI bronchoscopy with an OR of 3.6 (95% CI 1.53-8.46; p-value <0.01). Subjects with a tortuous vascular pattern (OR of 21.89; 95% CI 6.50-73.71; p-value <0.01) and subjects with IB 600 (OR of 5.39; 95% CI 1.62-17.71; p-value 0.01) were associated with tracheobronchial cell morphological abnormalities.