

ABSTRACT

THE CORRELATION BETWEEN GENEXPERT TESTS PRESENCE OF *Mycobacterium tuberculosis* (MTB) ALONG WITH RIFAMPICIN RESISTANCE AND THE EXTENT OF THORACIC RADIOGRAPHY LESIONS IN ADULT PULMONARY TUBERCULOSIS PATIENTS AT RSUD DR. H. ABDUL MOELOEK LAMPUNG

By

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Background: Indonesia was abundant with unreported tuberculosis (TB) cases as well as cases of multidrug-resistant/Rifampicin-resistant TB in 2021. GeneXpert test holds the ability to not only detect Rifampicin resistance, but also increase the number of bacteriologically confirmed TB patients among negative acid-fast bacilli (AFB) smear cases since its sensitivity surpasses that of AFB smear. Earlier finding presented that a normal thoracic radiography doesn't necessarily mean a negative bacteriological examination result. This study aimed to investigate whether the amount of *Mycobacterium tuberculosis* (MTB) and the resistance of said bacteria to Rifampicin affect the degree of lung lesion or, in other words, create an advanced damage.

Method: Observational analytical research with a cross sectional approach. The samples were 110 medical records of adult pulmonary TB (PTB) patients obtained using total sampling technique. The data were analysed using the Kruskal-Wallis and Chi-Square tests.

Results: Both the majority of Rifampicin-resistant and Rifampicin-sensitive patients, either with "MTB detected high", "MTB detected medium", or "MTB detected low" results, presented with far advanced lesions. Based on the Kruskal-Wallis test outcome, there was no correlation between the presence of MTB and the extent of lesions in 29 Rifampicin-resistant patients (p-value = 0.338). Similar result were found in the Chi-Square test outcome, in which there was also no correlation between Rifampicin resistance and the extent of lesions in 110 patients (p-value = 0.561). However, there was a correlation between the presence of MTB and the extent of lesions in 81 Rifampicin-sensitive patients (p-value = 0.009).

Conclusion: This study shows that, although there is no significant statistical correlation between the presences of MTB in Rifampicin-resistant patients along with the Rifampicin resistances itself and the extent of lung lesions, both Rifampicin-resistant MTB and Rifampicin-sensitive MTB have equal potentials in causing advanced lung lesions. On the other hand, there is a significant statistical correlation between the presences of MTB in Rifampicin-sensitive patients and the extent of lung lesions. This concludes that the higher the amounts of MTB, the more serious the lung lesions in patients with sensitivity to Rifampicin.

Keywords: Extent of lesion, GeneXpert, *Mycobacterium tuberculosis*, pulmonary tuberculosis, Rifampicin resistance, thoracic radiography.

ABSTRAK

HUBUNGAN KEBERADAAN *Mycobacterium tuberculosis* (MTB) DAN RESISTENSI RIFAMPICIN TES GENEXPERT DENGAN LUAS LESI RADIOGRAFI TORAKS PADA PASIEN TUBERKULOSIS PARU DEWASA DI RSUD DR. H. ABDUL MOELOEK LAMPUNG

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Latar Belakang: Indonesia memiliki sangat banyak jumlah kasus TB tidak dilaporkan serta kasus TB *multidrug-resistant* dan resisten Rifampicin di tahun 2021. Tes GeneXpert tidak hanya mempunyai kemampuan mendeteksi resistensi Rifampicin, tetapi juga meningkatkan jumlah pasien TB terkonfirmasi bakteriologis di antara kasus pemeriksaan sputum Basil Tahan Asam (BTA) negatif karena memiliki sensitivitas yang lebih tinggi dibandingkan pemeriksaan sputum BTA. Penelitian sebelumnya menemukan bahwa radiografi toraks normal tidak selalu berarti hasil pemeriksaan bakteriologis negatif. Penelitian ini bertujuan untuk mengetahui apakah jumlah *Mycobacterium tuberculosis* (MTB) dan resistensi bakteri tersebut terhadap Rifampicin memengaruhi derajat lesi paru atau, dengan kata lain, menyebabkan kerusakan berat.

Metode: Penelitian analitik observasional dengan pendekatan *cross sectional*. Sampel merupakan 110 rekam medis pasien TB paru dewasa yang diperoleh menggunakan teknik *total sampling*. Data dianalisis menggunakan uji Kruskal-Wallis dan *Chi-Square*.

Hasil: Mayoritas pasien resisten Rifampicin maupun sensitif Rifampicin, baik dengan hasil “*MTB detected high*”, “*MTB detected medium*”, ataupun “*MTB detected low*” menunjukkan gambaran lesi *far advanced*. Berdasarkan hasil uji Kruskal-Wallis, tidak terdapat hubungan antara keberadaan MTB dengan luas lesi pada 29 pasien resisten Rifampicin ($p\text{-value} = 0,338$). Hasil yang serupa ditemukan pada hasil uji *Chi-Square*, yaitu tidak ada hubungan antara resistensi Rifampicin dengan luas lesi pada 110 pasien ($p\text{-value} = 0,561$). Akan tetapi, terdapat hubungan antara keberadaan MTB dengan luas lesi pada 81 pasien sensitif Rifampicin ($p\text{-value} = 0,009$).

Kesimpulan: Penelitian ini menunjukkan bahwa, meskipun tidak terdapat hubungan signifikan secara statistik antara keberadaan MTB pada pasien resisten Rifampicin dan resistensi Rifampicin itu sendiri dengan luas lesi paru, baik MTB yang resisten Rifampicin maupun sensitif Rifampicin memiliki potensi yang setara dalam menimbulkan lesi paru berat. Di sisi lain, terdapat hubungan bermakna secara statistik antara keberadaan MTB pada pasien sensitif Rifampicin dengan luas lesi paru. Hal ini menunjukkan bahwa semakin banyak jumlah MTB, semakin berat lesi paru pada pasien sensitif Rifampicin.

Kata Kunci: GeneXpert, luas lesi, *Mycobacterium tuberculosis*, radiografi toraks, resistensi Rifampicin, tuberkulosis paru.