

ABSTRAK

Latar Belakang: Indonesia menempati peringkat ketiga dunia dalam jumlah penderita tuberkulosis, dengan lebih dari sepertiga penduduk terdampak. Pengobatan tuberkulosis di Indonesia mengacu pada pedoman global WHO, dengan rifampisin dan INH sebagai obat utama. Efektivitas pengobatan sangat bergantung pada profil farmakokinetika rifampisin.

Tujuan: untuk mengevaluasi profil farmakokinetika rifampisin dalam sediaan *fixed dose combination* (FDC) yang digunakan di Indonesia.

Metode: Penelitian ini merupakan analisis data sekunder dari studi bioekivalensi yang dilakukan di Departemen Farmakologi dan Terapi. Data primer diperoleh melalui uji klinis acak terkontrol fase 1 pada sukarelawan sehat. Rifampisin diberikan secara oral, diikuti dengan pengambilan sampel darah serial, yang kemudian dianalisis menggunakan *high-performance liquid chromatography*. Parameter yang diukur meliputi waktu mencapai kadar puncak (T_{max}), kadar puncak (C_{max}), dan luas area di bawah kurva konsentrasi plasma terhadap waktu (AUC).

Hasil: Dari 15 subjek, 60% memenuhi kriteria kadar rifampisin di atas 8 $\mu\text{g/ml}$, sementara 40% tidak mencapai kadar yang diharapkan. Nilai rata-rata C_{max} adalah $9,97 \pm 0,67 \mu\text{g/ml}$, T_{max} $2,03 \pm 0,34$ jam, dan $AUC_{0-\infty}$ sebesar $85,48 \pm 5,81 \mu\text{g/ml/jam}$. Rifampisin tetap berada di atas konsentrasi hambat minimum (MIC) 1 $\mu\text{g/ml}$ selama 24 jam pada sebagian besar subjek.

Kesimpulan: Sebagian populasi subjek tidak mencapai kadar rifampisin yang optimal, yang dapat memengaruhi efektivitas pengobatan tuberkulosis. Hasil ini menyoroti pentingnya evaluasi lebih lanjut terhadap farmakokinetika rifampisin di populasi pasien untuk meningkatkan keberhasilan terapi.

Kata kunci: kadar rifampisin dalam darah, C_{max} , T_{max} , AUC, bioekivalen

ABSTRACT

Background: Indonesia ranks third in the world in the number of tuberculosis sufferers, with more than one-third of the population affected. Tuberculosis treatment in Indonesia refers to the WHO global guidelines, with rifampicin and INH as the main drugs. The effectiveness of treatment is highly dependent on the pharmacokinetic profile of rifampicin.

Objective: to evaluate the pharmacokinetic profile of rifampicin in fixed dose combination (FDC) preparations used in Indonesia.

Methods: This study is a secondary data analysis of a bioequivalence study conducted at the Department of Pharmacology and Therapeutics. Primary data were obtained through a phase 1 randomized controlled clinical trial in healthy volunteers. Rifampicin was administered orally, followed by serial blood sampling, which was then analyzed using high-performance liquid chromatography. Parameters measured included time to peak concentration (Tmax), peak concentration (Cmax), and area under the plasma concentration-time curve (AUC).

Results: Of the 15 subjects, 60% met the criteria for rifampicin levels above 8 µg/ml, while 40% did not reach the expected levels. The mean Cmax was 9.97 ± 0.67 µg/ml, Tmax 2.03 ± 0.34 hours, and AUC_{0-~} was 85.48 ± 5.81 µg/ml/hour. Rifampin remained above the minimum inhibitory concentration (MIC) of 1 µg/ml for 24 hours in most subjects.

Conclusion: A subset of the subject population did not achieve optimal rifampin levels, which may affect the efficacy of tuberculosis treatment. These results highlight the importance of further evaluation of rifampin pharmacokinetics in patient populations to improve therapeutic efficacy.

Keywords: rifampin plasma levels, Cmax, Tmax, AUC, bioequivalen