

ABSTRAK

VALIDASI METODE ANALISIS NORFLOKSASIN MENGGUNAKAN *ULTRA PERFORMANCE LIQUID CHROMATOGRAPHY* DENGAN FASE GERAK AIR-ASETONITRIL-TRIETILAMIN

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Norfloksasin merupakan antibiotik golongan fluorokuinolon yang memerlukan metode analisis valid dan sensitif untuk menjamin penetapan kadarnya. Penelitian ini bertujuan memvalidasi metode analisis norfloksasin menggunakan *Ultra Performance Liquid Chromatography* (UPLC) dengan fase gerak air–asetonitril–trietilamin berdasarkan parameter linearitas, sensitivitas, selektivitas, akurasi, dan presisi. Penelitian dilakukan di Laboratorium Farmakologi dan Laboratorium Terpadu Fakultas Kedokteran Hewan Universitas Gadjah Mada menggunakan instrumen UPLC *Agilent 1290 Infinity II* dengan kolom *Eclipse Plus C18*. Fase gerak yang digunakan berupa campuran air dan asetonitril (70:30 volume/volume) dengan penambahan 0,3 mL trietilamin dan asam asetat glasial hingga pH menjadi 4. Larutan sampel norfloksasin dibuat dalam berbagai konsentrasi yaitu 50; 10; 5; 1; 0,5; 0,1; 0,05; dan 0,01 µg/mL, kemudian dianalisis dengan panjang gelombang 260 nm, laju alir 1 mL/menit, volume injeksi 10 µL, dengan 3 kali pengulangan tiap konsentrasi. Hasil penelitian menunjukkan bahwa metode memiliki linearitas baik dengan nilai koefisien korelasi (r) sebesar 0,9999. *Limit of Detection* (LOD) dan *Limit of Quantification* (LOQ) berturut-turut sebesar 0,6524 µg/mL dan 2,1749 µg/mL. Metode menghasilkan selektivitas yang baik ditunjukkan dengan puncak area pada waktu retensi 0,283 menit tanpa adanya interferensi dari fase gerak. Hasil akurasi %*recovery* memenuhi kriteria pada konsentrasi 50 µg/mL dan 10 µg/mL, sedangkan pada konsentrasi rendah nilai %*recovery* masih bervariasi. Presisi memenuhi kriteria pada konsentrasi 50; 10; 5; 1; 0,1; dan 0,05 µg/mL dengan *coefficient of variation* (CV) < 2%. Berdasarkan hasil penelitian, analisis dengan UPLC menggunakan fase gerak air–asetonitril–trietilamin dapat digunakan untuk analisis kadar norfloksasin, namun perlu optimasi lebih lanjut dan pengaturan pH fase gerak.

Kata Kunci: Air-Asetonitril-Trietilamin, Metode, Norfloksasin, Parameter, *Ultra Performance Liquid Chromatography*

ABSTRACT

ANALYTICAL METHOD VALIDATION OF NORFLOXACIN USING ULTRA PERFORMANCE LIQUID CHROMATOGRAPHY WITH WATER-ACETONITRILE-TRIETHYLAMINE MOBILE PHASE

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Norfloxacin is a fluoroquinolone antibiotic that requires a valid and sensitive analytical method to ensure accurate determination of its concentration. This study aimed to validate an analytical method for norfloxacin using Ultra Performance Liquid Chromatography (UPLC) with a water–acetonitrile–triethylamine mobile phase, based on the parameters of linearity, sensitivity, selectivity, accuracy, and precision. The study was conducted at the Pharmacology Laboratory and the Integrated Laboratory of the Faculty of Veterinary Medicine, Gadjah Mada University, using an Agilent 1290 Infinity II UPLC instrument with an Eclipse Plus C18 column. The mobile phase used was a mixture of water and acetonitrile (70:30 volume/volume) with the addition of 0.3 mL of triethylamine and glacial acetic acid until the pH reached 4. Norfloxacin sample solutions were prepared at various concentrations, namely 50; 10; 5; 1; 0.5; 0.1; 0.05; and 0.01 µg/mL, and were then analyzed at a wavelength of 260 nm, a flow rate of 1 mL/min, and an injection volume of 10 µL, with three replicates for each concentration. The results of the study indicate that the method exhibits good linearity, with a correlation coefficient (r) of 0.9999. The Limit of Detection (LOD) and Limit of Quantification (LOQ) were 0.6524 µg/mL and 2.1749 µg/mL, respectively. The method exhibits good selectivity, as evidenced by a peak area at a retention time of 0.283 minutes without interference from the mobile phase. The accuracy results for % recovery meet the criteria at concentrations of 50 µg/mL and 10 µg/mL, while at lower concentrations, recovery values still vary. Precision met the criteria at concentrations of 50, 10, 5, 1, 0.1, and 0.05 µg/mL with a coefficient of variation (CV) <2%. Based on the research results, analysis by UPLC using an aqueous–acetonitrile–triethylamine mobile phase can be used for the determination of norfloxacin levels; however, further optimization and adjustment of the mobile phase pH are required.

Keywords: *Method, Norfloxacin, Parameter, Ultra Performance Liquid Chromatography, Water-Acetonitrile-Triethylamine*