Pengembangan dan validasi metode analisis favipiravir dalam volumetric absorptive microsampling menggunakan kromatografi cair kinerja tinggiphotodiode array = Development and validation method for quantification of favipiravir in volumetric absorptive microsampling using high performance liquid chromatographyphotodiode array

Cahaya Azzahra Rahmadhani, author

Abstrak

Favipiravir merupakan prodrug hasil modifikasi gugus pirazin dari senyawa T-1105 yang diberikan sebagai terapi COVID-19. Pada masa pandemi diperlukan teknik biosampling yang aman dan nyaman untuk subjek atau pasien. Volumetric Absorptive Microsampling (VAMS) merupakan teknik biosampling dengan volume darah yang kecil dan meminimalisasi efek hematokrit. Belum ada penelitian favipiravir dalam Volumetric Absorptive Microsampling menggunakan Kromatografi Cair Kinerja Tinggi-Photodiode Array. Penelitian yang dilakukan bertujuan untuk mengembangkan dan memvalidasi metode analisis favipiravir dalam sampel VAMS menggunakan remdesivir sebagai baku dalam secara Kromatografi Cair Kinerja TinggiPhotodiode Array. Analisis favipiravir dilakukan dengan menggunakan kolom C18 (Waters, Sunfire™ 5m; 250×4,6 mm), volume injeksi 50 L, laju alir 0,8 mL/menit, suhu kolom 30 pada panjang gelombang 300 nm. Pemisahan dilakukan menggunakan fase gerak asetonitril-asam format 0,2%-natrium dihidrogen fosfat 20 mM pH 3,5 dengan elusi gradien selama 15 menit. Preparasi sampel dilakukan dengan metode pengendapan protein menggunakan 500 L metanol dengan pengocokan vortex selama 30 detik, sonikasi selama 15 menit, dan sentrifugasi pada 10.000 rpm selama 10 menit. LLOQ yang didapatkan sebesar 0,5 g/mL dan rentang kurva kalibrasi 0,5-160 g/mL dengan koefisien korelasi 0,99825-0,99860. Metode yang dikembangkan telah memenuhi parameter validasi penuh yang dikeluarkan oleh Food and Drug Administration 2018

.....Favipiravir is a prodrug of T-1105 made by modifying the pyrazine group as a COVID-19 therapy. During the pandemic, a safe and comfortable biosampling technique is needed for the subject or patient. Volumetric Absorptive Microsampling (VAMS) is a biosampling technique with a small blood volume and minimum hematocrit effect. There has been no study to analyze favipiravir in VAMS using High-Performance Liquid Chromatography-Photodiode Array yet. The aims of this study were to develop and validate an analytical method for quantifying favipiravir in VAMS using High Performance Liquid Chromatography – Photodiode Array with remdesivir as an internal standard. Analysis of favipiravir was performed using a C18 column (Waters, Sunfire™ 5m; 250 × 4.6 mm), with injection volume of 50 L, flow rate 0.8 mL/min, column temperature 30 , and wavelength 300 nm. The separation was conducted under gradient elution with mobile phase consists of acetonitrile-0.2% formic acid-20 mM sodium dihydrogen phosphate pH 3.5 and run time 12 minutes. Sample preparation was carried out using a protein precipitation method with 500 L of methanol as precipitating agent. Samples were mixed on vortex for 30 seconds, sonicated for 15 minutes, and centrifuged at 10,000 rpm for 10 minutes. The LLOQ obtained was 0,5 g/mL and the calibration curve ranged from 0,5 to 160 g/mL with a correlation coefficient of 0.99825-0.99860. The method developed has succesfully met the full validation requirements by Food and Drug Administration 2018.