INTISARI

PROFIL FARMAKOKINETIK KOMBINASI ANTIBIOTIK NORFLOKSASIN-TILOSIN PADA HATI, GINJAL, DAN OTOT DADA AYAM BROILER

Cahyo Wibisono
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Studi farmakokinetik merupakan kajian ilmu yang mempelajari perjalanan obat dalam tubuh meliputi proses absorpsi, distribusi, metabolisme dan ekskresi obat. Tujuan penelitian ini untuk mengetahui profil farmakokinetik kombinasi norfloksasin dan tilosin pada hati, ginjal, dan otot dada ayam broiler dosis 63 mg/kg BB yang diberikan sekali dosis per oral. Penelitian menggunakan ayam broiler strain *Cobb* sebanyak 36 ekor yang dipelihara selama 35-38 hari. Antibiotik diberikan pada semua ayam kecuali ayam kontrol, selanjutnya diambil sampel jaringan hati, ginjal, dan otot dada setelah ayam disembelih pada menit 0 (sesaat setelah pemberian), 15, 30 dan jam ke 2, 6, 8, 16, 24, 48, 72, 96, 120, dengan jumlah sampel tiap interval waktu 3 ekor. Sampel jaringan selanjutnya diekstraksi, kemudian dianalisis kadarnya. Validasi metode analisis pengukuran kadar dilakukan untuk mencari nilai linearitas, akurasi, presisi, spesifisitas, sensitivitas, batas deteksi (LOD), dan batas kuantifikasi (LOQ). Penentuan parameter farmakokinetik dengan model non kompartemen meliputi nilai kadar maksimum obat (Cmaks), waktu maksimum obat mencapai kadar puncak (Tmaks), waktu paruh eliminasi (T1/2), dan *Area Under Curve* (AUC). Nilai efektivitas obat diukur secara *Pharmacokinetics-Pharmacodynamics* (PK/PD) berdasarkan Cmaks, AUC dan *Minimum Inhibitor Concentration* (MIC) beberapa bakteri patogen. Nilai residu dibandingkan dengan Standar Nasional Indonesia (SNI). Hasil validasi metode pengukuran kadar dinyatakan valid karena memiliki nilai linearitas, presisi, akurasi, spesifisitas, sensitivitas, batas deteksi dan, batas kuantifikasi yang memenuhi standar. Nilai parameter farmakokinetik norfloksasin pada hati: Tmaks/Cmaks 2 jam/16,98 µg/mL; T1/2 eliminasi 9,5 jam; AUC 851,9425 µg/mL.jam; ginjal: Tmaks/Cmaks 2 jam /18,75 µg/mL; AUC 610,8625 µg/mL.jam, T1/2 eliminasi 36,5 jam; otot dada: Tmaks/Cmaks 24 jam/17,02 µg/mL, AUC 1038,73 µg/mL.jam dan T1/2 eliminasi 27,72 jam. Farmakokinetik tilosin pada hati: Tmaks/Cmaks 8 jam/11,56 µg/mL; AUC 368.5588 µg/mL.jam; T1/2 eliminasi 8,6 jam; ginjal Tmaks/Cmaks 16 jam/6,88 µg/m; AUC 293,0038 µg/mL.jam; T1/2 eliminasi 12,6 jam; otot dada Tmaks/Cmaks 24 jam/9,12 µg/mL; AUC 496,1988 µg/mL.jam, dan T1/2 eliminasi 8,34 jam. Kesimpulan penelitian adalah metode pengukuran kadar memliki validitas yang baik dan dapat digunakan untuk mengukur parameter farmakokinetik norfloksasin-tilosin. Nilai terapi norfloksasin Cmaks/MIC = 12 dan AUC/MIC = 125, sedangkan tilosin Cmaks/MIC = 10, AUC/MIC = 100, dan T>MIC = 50%. Hari ke-5, residu norfloksasin di hati, ginjal, dan otot dada masing-masing masih tinggi 0,14; 1,66; dan 2,28 µg/mL, sedangkan residu tilosin di ginjal dan otot sudah tidak terdeteksi.

Kata kunci: Broiler, Farmakokinetik, Hati, Ginjal, Norfloksasin-Tilosin, Otot dada

ABSTRACT

Pharmacokinetic Profile of the Combination of Antibiotics Norfloxacin-Tylosin in Liver, Kidney, and Breast Muscle of Broiler Chickens

Cahyo Wibisono
23/529020/SKH/00163

Pharmacokinetic studies are scientific investigations that investigate the absorption, distribution, metabolism, and excretion of pharmaceuticals within the body. This investigation was conducted to ascertain the pharmacokinetic profile of the combination of norfloxacin and tylosin in the liver, kidney, and breast muscle of broiler chickens at a single oral dose of 63 mg/kg BW. The research employed 36 Cobb strain broiler chickens that were reared for 35-38 days. The chickens were administered antibiotics, with the exception of the control chickens. Liver, kidney, and breast muscle tissue samples were collected after the chickens were slaughtered at 0, 15, 30, 2, 6, 8, 16, 24, 48, 72, 96, and 120 hours. The number of samples for each time interval was three chickens. Subsequently, the tissue samples were extracted and subsequently analyzed for levels. The analysis method for level measurement was validated to determine the values of linearity, accuracy, precision, specificity, sensitivity, limit of detection (LOD), and limit of quantification (LOQ). The pharmacokinetic parameters that are determined using a non-compartmental model include the maximum drug concentration (Cmax), the maximum time the drug takes to reach peak levels (Tmax), the elimination half-life (T1/2), and the Area Under Curve (AUC). The drug's efficacy is assessed through Pharmacokinetics-Pharmacodynamics (PK/PD) using the Minimum Inhibitor Concentration (MIC), AUC, and Cmax of numerous pathogenic bacteria. Comparison to Indonesian National Standard (SNI) residue value. The level measuring method's validation findings meet criteria for linearity, precision, accuracy, specificity, sensitivity, detection limit, and quantification limit. Liver pharmacokinetic parameters for norfloxacin: AUC 851.9425 µg/mL; Tmax/Cmax 2 hours/16.98 µg/mL; T1/2 elimination 9.5 hours. Tmax/Cmax: kidney: 2 hours/18.75 µg/mL; AUC 610.8625 µg/mL; T1/2 elimination: 36.5 hours; pectoral muscle: 24 hours/17.02 µg/mL, AUC 1038.73 µg/mL.T1/2 hour elimination takes 27.72 hours. Tylosin liver pharmacokinetics: Tmax/Cmax 8 hours/11.56 µg/mL; AUC 368.5588 µg/mL.hour; T1/2 elimination 8.6 hours; renal Tmax/Cmax 16 hours/6.88 µg/mL; AUC 293.0038 µg/mL.hour; T1/2 elimination 12.6 hours; chest muscle Tmax/Cmax 24 hours/9.12 µg/mL; AUC 496.1988 µg/mL.hour; T1/2 elimination 8.34 hours. The research demonstrated that level measurement can quantify norfloxacin-tylosin's pharmacokinetics. Therapeutic value of norfloxacin is 12, AUC/MIC is 125, and T>MIC is 50%. Tylosin is 10, AUC/MIC is 100, and T>MIC is 50% Norfloxacin residues in the liver, kidney, and pectoral muscle remained high at 0.14, 1.66, and 2.28 µg/mL on day 5, but tylosin residues were no longer found.

Keywords: Broiler Chicken, Chest muscle, Kidney, Liver, Norfloxacin – Tylosin, Pharmacokinetics