
Poster

[P25-4] P25-4: Anti-infective drugs (4): Vancomycin

Chair: Noboru Okamura, Japan

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[P25-4-4] Population pharmacokinetic analysis of vancomycin in patients with hematopoietic stem cell transplantation

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Background

In patients with hematopoietic stem cell transplantation (HSCT), the infection in the process of engraftment remains a critical problem and vancomycin (VCM) is empirically used for febrile neutropenia. Although there are many reports on population pharmacokinetics (PopPK) of VCM, little information is available on the VCM PopPK in HSCT patients. The present retrospective study was performed to build a VCM PopPK in the patients with HSCT.

Methods

Adult patients who underwent HSCT and received the treatment with VCM at the Institute of Biomedical Research and Innovation Hospital (Hyogo, Japan) from March 2013 to December 2016 were enrolled in this retrospective study. The serum VCM concentrations were adapted by two-compartment model with nonlinear mixed effect model using a computer program, NLME 7.0 (Certara LP, Princeton, NJ, USA). As the basic model, creatinine clearance (CLcr) calculated by Cockcroft-Gault formula was integrated to VCM clearance. Patient characteristics such as biochemical parameters, type of donor source, type of pretreatment for transplantation, and post-engraftment days were evaluated for candidate covariates and were introduced to the basic model when the model was significantly improved.

Results

One hundred forty-nine VCM concentrations were obtained from 53 patients. Most patients in this study population had no marked decline in kidney function (mean value of CLcr = 117 ± 36 mL/min), but were characterized by the decrease in hematocrit levels (mean value of hematocrit level = 24.6 ± 4.1%). The estimated population mean of distribution volume of VCM in HSCT patients was approximately 2-fold higher than previously reported in healthy subjects.

Conclusions

In the present study, VCM PopPK in HSCT patients was built and well-validated. Although further study in a large number of patients with/without HSCT should be conducted, the obtained results would be useful information on the dosing strategy of VCM in HSCT patients.