Influences of %T > MIC Achievement Probability Due to the Difference of the MIC Measurement Concentration Range

_Analysis of Meropenem for Pseudomonas aeruginosa_

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Abstract We attempted to analyze any influences to %T > MIC achievement probability due to the difference of the MIC measurement concentration range of MEPM for 613 strains of Pseudomonas aeruginosa by the Monte Carlo simulation method. As for the analysis, we calculated the achievement probability of 30% and 50% for MEPM %T > MIC by the administration volume of MEPM: 250 mg, 500 mg, and 1,000 mg, the administration time: 0.5 h, and 3 h, the administration frequency: 2 times, and 3 times, and the renal excretion capability: Normal, Slight, Moderate, and High abnormal with the 3 types of MIC concentration measurement level 1) < = 0.06 < = 256 g/ml: 13 levels, 2) < = 0.5 < = 32 g/ml: 7 levels, and 3) < = 1 = 16 g/ml: 5 levels. As the result, we found the following findings; 1. In terms of the administration of normal renal excretion capability, 250 mg, in comparison with 500 mg and 1,000 mg, indicated the differential due to the difference of MIC measurement concentration range. 2. The administration volume of MEPM 500 mg which has been recommended shown the less differential of the achievement probability due to the difference of MIC measurement concentration range. As the renal excretion was shifted through Normal to Slight to Moderate to High abnormal, the differential of the achievement probability due to the difference of MIC measurement concentration range was gradually decreased. With these results, PK/PD analysis is possible for the 5 levels measurement concentration. It is significant that the facility using the automated microbiology analyzer can provide not only the MIC report, but also the information on the appropriate administration method for antibacterial drug by PK/PD analysis.
Key Words: pharmacokinetics, pharmacodynamics, time above MIC, Pseudomonas aeruginosa, meropenem

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