The Pharmacodynamics Optimization of Intermittent Vancomycin Dosage Regimens in Methicillin-Resistant *Staphylococcus aureus* Infections with MIC of 1.5 and 2.0 mg/L in Thai Population

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Background
There are increasing number of articles questioning the efficacy of vancomycin to treat methicillin-resistant *Staphylococcus aureus* (MRSA) with MIC 1.5mg/L and 2.0mg/L. However, vancomycin is still used as the cornerstone treatment of MRSA infection particularly in most of developing countries with limited alternative MRSA coverage antibiotics. Owing to the interest whether vancomycin still enable to be used as the cornerstone treatment for MIC 1.5mg/L and 2mg/L, present study was conducted to analyze the achievement of vancomycin desired PK-PD indices in MRSA-infected Thai population.
Methods
Monte Carlo simulation by using 10,000 replications was performed for several vancomycin intermittent dosage regimens ranging from 1g every 6, 8, 12h, 1.5g and 2 g every 12h. Vancomycin concentrations were estimated from population PK study conducted in 212 Thai population. The probability of target attainment (PTA) of each intermittent dosage regimen was calculated from the number of simulated patients who achieved AUC_{24}/MIC ≥400 for MIC 1.5mg/L and 2.0mg/L divided by total number of replication.
Results
Dosage regimen 1g every 12h couldn't afford desired PTA for MRSA with MIC 1.5mg/L and 2.0mg/L. Considering the MRSA with MIC 1.5mg/L, dosage regimen 1g every 8h and 1.5g every 12h could afford PTA >80%. However, if particular conditions required PTA >90%, dosage regimen 1g every 6 hours or 2g every 12h should be recommended as the most appropriate dosage regimen. While, for MRSA with MIC 2.0mg/L, only dosage regimens 4g/day, either given as 1g every 6h or 2g every 12h, could afford PTA >80%. No any dosage regimens could afford PTA >90% for MRSA with MIC 2.0mg/L. All PTA achievement represented the PTA at steady state condition.
Conclusions
Intermittent dosage regimen at least 3g/day and 4g/day were needed to afford desired PTA achievement for MRSA with MIC 1.5mg/L and 2.0mg/L, respectively. Finding of present study could be used as a guidance in determining the best intermittent dosage regimen in documented vancomycin treatment. Further study was needed to determine the most appropriate intermittent dosage regimen that could achieve the desired PTA for the 1st 24h.