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Chinese consensus guidelines for therapeutic drug monitoring of polymyxin B, endorsed by the Infection and Chemotherapy Committee of the Shanghai Medical Association and the Therapeutic Drug Monitoring Committee of the Chinese Pharmacological Society

Key words: polymyxin B; therapeutic drug monitoring; pharmacokinetics; clinical efficacy

Research Summary

- Polymyxin B is a last-line antibiotic for extensively drug-resistant Gram-negative bacterial infections.
- Due to the risk of nephrotoxicity, treatment failure, and emergence of resistance, there is an urgent clinical need to perform therapeutic drug monitoring (TDM) to optimize the use of polymyxin B.
- The consensus is endorsed by the Infection and Chemotherapy Committee of the Shanghai Medical Association and the Therapeutic Drug Monitoring Committee of the Chinese Pharmacological Society.
- The consensus panel was composed of clinicians, pharmacists, and microbiologists from different provinces in China and Australia
- The guidelines provide the first-ever consensus on conducting TDM of polymyxin B, and are intended to guide optimal clinical use.

Recommendations

- ***R1***: The recommended TDM target of polymyxin B treated systemic infections for clinical efficacy and safety is a $C_{ss,avg}$ of 2─4 mg/L, corresponding to an $AUC_{ss,24h}$ of 50─100 mg·h/L
- ***R2***: For patients with normal renal function and in the absence of a loading dose, TDM samples should be collected before and after the fourth or fifth dose. If a loading dose is administered, samples can instead be collected before and after the second or third dose. Samples for trough concentrations should be collected no earlier than 0.5 h before the next infusion, and samples for peak concentrations should be collected within 0.5 h of the end of the infusion.

Figure 4

Recommendations

- ***R3***: Employ the first-order elimination-based equation method to calculate $AUC_{ss,24h}$ or $C_{ss,avg}$ when a suitable popPK model is not available.
- ***R4***: Apply a popPK model and Bayesian feedback to calculate $AUC_{ss,24h}$ or $C_{ss,avg}$.
- ***R5***: For patients with $C_{ss,avg}$<2 mg/L or $AUC_{ss,24h}$<50 mg·h/L, dose adjustments should be based on clinical and microbiological efficacy. A dosage increase is recommended when the clinical condition of the patient is not improving.
- ***R6***: For patients with $C_{ss,avg}$>4 mg/L or $AUC_{ss,24h}$>100 mg·h/L, the dose should be reduced based on TDM results in order to reduce the likelihood of nephrotoxicity.

Figure 4