Evaluation of a high loading dose regimen of teicoplanin in children. Yamada T [1,2], Okuzono S [3,4], Motomura Y [3], Hirota T [2], Egashira N [1,2], Ohga S [3], Ieiri I [2].

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Background: Teicoplanin is a glycopeptide antibiotic used for the treatment of Gram-positive infections. We previously reported that approximately half of children treated with teicoplanin at the standard loading dose (10 mg/kg every 12 hours for 3 doses, followed by 10 mg/kg once daily) did not achieve a target trough concentration of 15–30 mg/L. Furthermore, we proposed that an increased loading dose would be necessary to rapidly achieve the target trough concentration in children, based on population pharmacokinetic analyses. This study aimed to evaluate the efficacy and safety of a high loading dose regimen for children in a real-world clinical setting.

Methods: The retrospective study was conducted from January 2018 to June 2021. The analysis included children aged 2–16 years who were treated with teicoplanin at the high loading dose regimen (15 mg/kg every 12 hours for 3 doses, followed by 10 mg/kg once daily). Trough concentrations and the incidence of nephrotoxicity and hepatotoxicity after the high loading dose of teicoplanin were evaluated.

Results: A total of 86 children received the high loading dose regimen of teicoplanin. The median trough concentration on day 3 or 4 was 18.1 (range: 3.2–39.6) mg/L. Fifty-five of 86 patients (64%) achieved the target trough concentration (> 15 mg/L). The incidence of nephrotoxicity and hepatotoxicity was 4.7% and 1.2%, respectively. Simulation analysis, using individual pharmacokinetic parameters obtained from a posteriori Bayesian estimation, revealed that further increase in the loading dose was warranted for children aged 2–11 years with an estimated glomerular filtration rate of >150 mL/min/1.73 m^2 to achieve the target trough concentration.

Conclusions: The high loading dose regimen of teicoplanin was found to safely elevate the trough concentrations and improve the target attainment in children. For further optimization, dose selection stratified by age and renal function would be recommended.

Key Words: teicoplanin, loading dose, children, therapeutic drug monitoring