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Optimal Use and Need for Therapeutic Drug Monitoring of Teicoplanin in Children: A Systematic Review

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ABSTRACT

Background: Teicoplanin is a glycopeptide antimicrobial that treats serious invasive infections caused by gram-positive bacteria, such as the methicillin-resistant *Staphylococcus aureus*.

Despite some comparable advantages, there is no guideline or clinical recommendation for teicoplanin in the pediatric population, unlike vancomycin where abundant studies and the recently revised guideline on therapeutic drug level monitoring (TDM) exist.

Methods: The systematic review was performed in accordance with the preferred reporting items for systematic reviews. Two authors (JSC and SHY) searched PubMed, Embase, and Cochrane Library databases using relevant terms independently.

Results: Fourteen studies were finally included with a total of 1,380 patients. TDM was available in 2,739 samples collected in the nine studies. Dosing regimens varied widely, and eight studies used recommended dosing regimens. Timing for measuring TDM was mostly 72–96 hours or longer after the initiation of the first dose, which was expected to be a steady-state. The majority of studies had target trough levels of 10 µg/mL or above. Three studies reported that the clinical efficacy and treatment success rate of teicoplanin was 71.4%, 87.5%, and 88%. Adverse events associated with teicoplanin use were described in six studies with a focus on renal and/or hepatic impairment. Except for one study, no significant relation was noted between the incidence of adverse events and trough concentration.

Conclusion: Current evidence on teicoplanin trough levels in pediatric populations is insufficient due to heterogeneity. However, target trough levels with favorable clinical efficacy are achievable by recommended dosing regimen in the majority of patients.

Keywords: Teicoplanin; Therapeutic Drug Level Monitoring; Children

INTRODUCTION

Teicoplanin was produced from *Actinoplanes teichomyceticus*, isolated in a soil in India in 1978.¹ It is available in Europe, Asia, and South America but not in the United States. Teicoplanin is

