International Journal of Pharmacology and Clinical Research

ISSN Print: 2664-7613
ISSN Online: 2664-7621
Impact Factor: RJIF 8.29
IJPCR 2025; 7(2): 618-620
www.pharmacologyjournal.in
Received: 11-09-2025
Accepted: 13-10-2025

JS Venkatesh
Professor, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

Dr. Santosh Uttangi
Pharm D. Interns, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

Mallikarjun HM
Pharm D. Interns, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

Akshara S Jeevan
Pharm D. Interns, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

Aleena Fernandez
Pharm D. Interns, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

Albin Johnson
Pharm D. Interns, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

Corresponding Author:
Mallikarjun HM
Pharm D. Interns, S. C. S. College of Pharmacy, Harapanahalli, Karnataka, India

The Rise of Dalbavancin in MRSA and Skin Infections – A Review of Therapeutic Benefits

JS Venkatesh, Santosh Uttangi, Mallikarjun HM, Akshara S Jeevan, Aleena Fernandez and Albin Johnson

DOI: https://www.doi.org/10.33545/26647613.2025.v7.i2h.158

Abstract
Methicillin-resistant Staphylococcus aureus (MRSA) remains a major global cause of acute bacterial skin and skin structure infections (ABSSSI), posing challenges due to rising resistance, treatment failures, and the need for prolonged intravenous therapy. Traditional agents such as vancomycin and daptomycin require daily dosing, extended hospitalization, increasing healthcare burden. Dalbavancin, a long-acting lipoglycopeptide, has emerged as a significant advancement with its excellent long half-life, potent bactericidal activity, and convenient once-weekly or single-dose regimen. Clinical trials and real-world evidence consistently demonstrate its non-inferiority to conventional therapies, excellent tolerability, and strong activity against MRSA. Its ability to reduce inpatient stay, avoid central-line complications, and support outpatient treatment makes it a valuable tool in antimicrobial stewardship. Thie following review highlights the dosing, PK/PD, therapeutic benefits, safety profile, and expanding clinical applications of dalbavancin in the evolving management of MRSA and skin infections.

Keywords: MRSA- Methicillin-resistant Staphylococcus aureus, SSTI- skin and soft tissue infections

Introduction
Dalbavancin is a novel long-acting semi-synthetic lipoglycopeptide. It is licensed for acute bacterial skin and skin structure infections (ABSSSI), caused by susceptible Gram-positive bacteria, including methicillin-resistant Staphylococcus aureus (MRSA), and vancomycin-resistant enterococci. Although vancomycin, linezolid, and daptomycin remain standard treatments, their limitations including nephrotoxicity, monitoring requirements, and hospitalization for intravenous therapy.
Dalbavancin's unique pharmacokinetics, excellent tolerability, and convenience have led to increasing adoption, particularly in outpatient and resource-limited settings. The last decade has seen growing evidence supporting its therapeutic value not only in SSTIs but also in deeper infections such as osteomyelitis.

Dosing, Pharmacokinetics, and Pharmacodynamics
Dalbavancin is currently FDA-approved at a dose of 1000 mg on day 1, followed by 500 mg on day 8 for a complete course of therapy for ABSSSI. Pharmacokinetic data from human studies demonstrate that dalbavancin possesses linear, dose-related pharmacokinetics with an extended elimination half-life of approximately 14.5 days allowing for the extended interval between doses. The approved dosing regimen was based on a clinical study evaluating complicated skin and skin structure infections (cSSSI) in which dalbavancin was dosed at 1000 mg initially, followed by 500 mg on day. Nearly 33% of dalbavancin is excreted unchanged in the urine, suggesting that non-renal mechanisms of elimination play an important role in its metabolism. In both healthy subjects and those with varying degrees of renal dysfunction, the maximum concentration (Cmax) of dalbavancin ranges from 248 to 312 µg/mL following the standard 1000 mg initial dose. Dalbavancin exhibits a large volume of distribution, with an initial average of 8–15 L once the drug has distributed throughout the tissues.

Clinical Efficacy in MRSA Skin Infections
The pivotal randomized clinical trials demonstrated that dalbavancin is non-inferior to

conventional daily therapies for ABSSSI. Once-weekly dosing (1000 mg followed by 500 mg) and the newer single-dose regimen (1500 mg) achieved similar clinical success rates compared with vancomycin followed by oral linezolid.
In MRSA-specific subgroups, clinical response rates consistently exceeded 90%, underscoring dalbavancin's potency. The convenience of completing treatment in as little as 30 minutes of infusion time is a significant advantage.
Real-world clinical studies reinforce these findings, with observational cohorts reporting high cure rates, low recurrence, and a significant reduction in hospital stay. The drug's ability to replace prolonged intravenous therapy makes it defending choice for outpatient parenteral antimicrobial therapy (OPAT) programs.

Device-associated infections
Sequential therapy studies show clinical success and reduced need for prolonged IV catheter use, a significant advantage for patients at risk of line-associated complications.

Safety and Tolerability
Dalbavancin has an exceptional safety profile. Adverse events associated with dalbavancin are typically mild, comprehensive symptoms such as headache, nausea, and infusion-related reactions. A key advantage over vancomycin is that dalbavancin is associated with a significantly reduced incidence of nephrotoxicity and does not require ongoing serum drug level monitoring
Meta-analyses confirm its appreciative risk–benefit profile, particularly for patients at higher risk for complications from prolonged intravenous therapy.

Impact on Healthcare Utilisation
The introduction of dalbavancin has significant implications for healthcare systems. Its ability to provide complete MRSA SSTI treatment in one or two doses enables:

- Early discharge
- Avoidance of central venous catheterisation
- Reduction in hospital length of stay
- Lower treatment costs in many scenarios

Outpatient Management and OPAT Advantages
Dalbavancin aligns ideally with OPAT principles. The single-dose or two-dose regimen allows clinicians to manage infections traditionally requiring 1–2 weeks of daily IV therapy without the need for daily visits or catheter maintenance.
Patients benefit from:

- Reduced complications
- Improved quality of life

Clinicians benefit from reduced monitoring and simplified follow-up schedules.

Global Surveillance and In-Vitro Activity
Global microbiological surveillance studies demonstrate that dalbavancin maintains potent in-vitro activity against MRSA, MSSA, streptococci, and Enterococcus faecalis. Its MIC values remain low, with minimal resistance observed over more than a decade of use.
This stability suggests that dalbavancin could continue to be a reliable therapeutic option even as resistance patterns evolve.

Future Directions and Emerging Evidence
Several ongoing and recent trials are exploring dalbavancin in other serious infections, such as MRSA bacteremia. The DOTS trial aims to evaluate dalbavancin as a potential step-down therapy for S. aureus bloodstream infections. Early protocol data indicate a strong interest in expanding its indications.
Additionally, with increasing cost-effectiveness data supporting its use, dalbavancin may become a preferred agent in settings seeking to reduce inpatient burden without compromising treatment outcomes.

Conclusion
Dalbavancin represents a significant advancement in the treatment landscape of MRSA and skin infections. Its long half-life, ease of administration, potent antimicrobial activity, excellent safety profile, and demonstrated efficacy position it as an attractive alternative to traditional MRSA therapies.
The ability to treat serious Gram-positive infections with one or two infusions is a transformative shift in infectious disease management. With growing clinical evidence, real-world success, and expanding interest in deeper infections such as osteomyelitis and bacteremia, dalbavancin's role is poised to continue rising.
As antimicrobial stewardship prioritizes both efficacy and reduced health system burden, dalbavancin stands out as a modern therapeutic tool that meets clinical, operational, and patient-centered goals.

References

1. Boucher HW, Wilcox M, Talbot GH, Puttagunta S, Das AF, Dunne MW. Once-weekly dalbavancin versus daily conventional therapy for acute bacterial skin and skin-structure infections. N Engl J Med. 2014;370(23):2169–2179.
2. Dunne MW, Puttagunta S, Sprenger CR, Rubino CM, Van Wart SA, Baldassarre J. Extended-duration dosing and distribution of dalbavancin into bone and articular tissue. Antimicrob Agents Chemother. 2015;59(4):1849–1855.
3. Rappo U, Richards RR, Howden BP, *et al*. Dalbavancin for the treatment of osteomyelitis in adults: a randomized clinical trial. Clin Infect Dis. 2018.
4. Aktas G, Derbentli S. In vitro activity of dalbavancin against staphylococci isolated in Istanbul, Turkey. Chemotherapy. 2010 Nov 18;56(6):444-7.
5. Dowell JA, Ambrose PG, Bhavnani SM, *et al*. Pharmacokinetic-pharmacodynamic modeling of dalbavancin: understanding extended dosing strategies. Antimicrob Agents Chemother. 2008.
6. Molina KC, Miller MA, Mueller SW, Van Matre ET, Krsak M, Kiser TH. Clinical pharmacokinetics and pharmacodynamics of dalbavancin. Clinical Pharmacokinetics. 2022 Mar;61(3):363-74.
7. Therapeutics P, Package I. Reference ID: 3473184. US Food Drug Adm. 2014.
8. Scott LJ. Dalbavancin: a review in acute bacterial skin and skin structure infections. Drugs. 2015 Jul;75(11):1281-91.

9. Nemčoková T. Syntéza a hodnocení sloučenin aktivních vůči rezistentním grampozitivním kokům.
10. Monteagudo-Martínez N, Solís-García del Pozo J, *et al*. Systematic review and meta-analysis on the safety and efficacy of dalbavancin. Expert Opin Drug Saf. 2021;20(9):1095–1107.
11. Bai F, Aldieri C, Cattelan A, Raumer F, Di Meco E, Moioli MC, *et al*. Efficacy and safety of dalbavancin in the treatment of acute bacterial skin and skin structure infections (ABSSSIs) and other infections in a real-life setting: data from an Italian observational multicentric study (DALBITA study). Expert Review of Anti-infective Therapy. 2020 Dec 1;18(12):1271-9.
12. Leanza GM, Rando E, Frondizi F, Taddei E, Giovannenze F, Horcajada JP, *et al*. A systematic review of dalbavancin efficacy as a sequential therapy for infective endocarditis. Infection. 2025 Feb;53(1):15-23.
13. Smith JR, Roberts KD, Rybak MJ. Dalbavancin: a novel lipoglycopeptide antibiotic with extended activity against Gram-positive infections. Infectious diseases and therapy. 2015 Sep;4(3):245-58.