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Impact of Pharmacist-Driven Antimicrobial De-escalation on Emerging Resistance and Clinical Outcomes in Patients with Bloodstream Infections

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Background

Antimicrobial resistance (AMR) is a growing global threat, projected to cause 10 million deaths annually by 2050. To combat this, The Joint Commission mandates hospitals to implement Antimicrobial Stewardship Programs (ASP), and the CDC recommends pharmacist co-leadership. This study evaluates the impact of pharmacist-driven antimicrobial de-escalation on the emergence of resistance in patients with bloodstream infections (BSI).

Method

This retrospective study was conducted at Sunpasitthiprasong Hospital and included hospitalized adults (≥18 years) with positive blood cultures from July 2024 to March 2025. Patients with multidrug-resistant organisms at baseline were excluded.

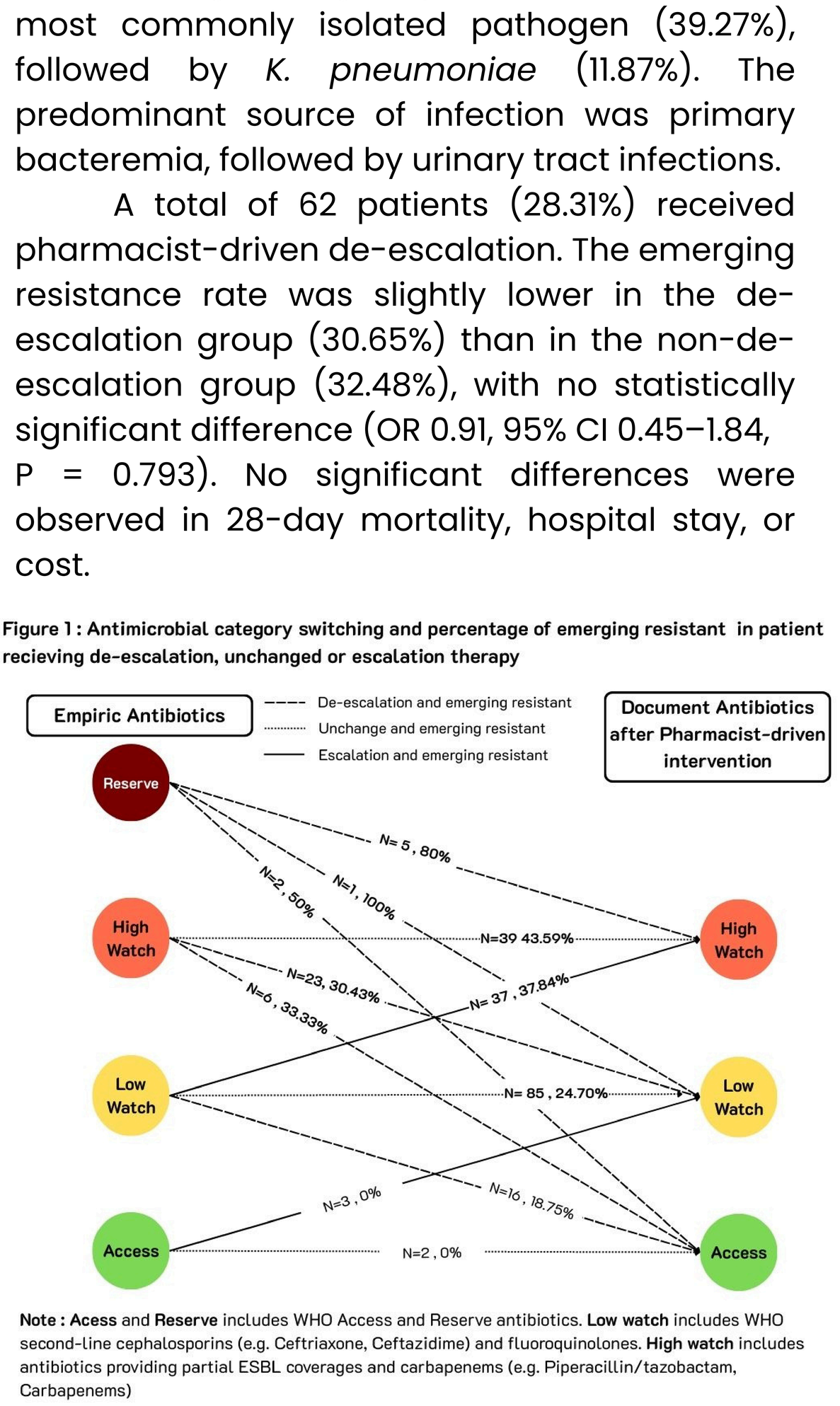
The primary outcome was the effect of pharmacist-recommended de-escalation on emerging resistance. Secondary outcomes included in-hospital mortality, length of stay, and hospitalization costs.

Results

Among 219 eligible patients, *E. coli* was the most commonly isolated pathogen (39.27%), followed by *K. pneumoniae* (11.87%). The predominant source of infection was primary bacteremia, followed by urinary tract infections.

A total of 62 patients (28.31%) received pharmacist-driven de-escalation. The emerging resistance rate was slightly lower in the de-escalation group (30.65%) than in the non-de-escalation group (32.48%), with no statistically significant difference (OR 0.91, 95% CI 0.45–1.84, P = 0.793). No significant differences were observed in 28-day mortality, hospital stay, or cost.

Figure 1 : Antimicrobial category switching and percentage of emerging resistant in patient recieving de-escalation, unchanged or escalation therapy



Note : Acess and **Reserve** includes WHO Access and Reserve antibiotics. **Low watch** includes WHO second-line cephalosporins (e.g. Ceftriaxone, Ceftazidime) and fluoroquinolones. **High watch** includes antibiotics providing partial ESBL coverages and carbapenems (e.g. Piperacillin/tazobactam, Carbapenems)

Conclusion

Pharmacist-driven de-escalation was not associated with increased resistance or adverse outcomes. It may be a safe and supportive strategy for antimicrobial stewardship. Further studies are warranted to confirm these findings.

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