

Vascular Access–Related Infections in Hemodialysis: Epidemiology and Risk Factors in a National Multicenter Analysis Introduction

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INTRODUCTION

Vascular access (VA) infections represent a major source of morbidity and mortality among hemodialysis patients. The infection risk significantly differs depending on the type of access, with central venous catheters (CVC) posing a higher risk compared to arteriovenous fistulas (AVF) and grafts (AVG). Infection control remains a critical quality indicator in dialysis care.

AIM

- Prevalence of vascular access infections in participating dialysis centers
- Distribution of infectious episodes between the different types of VA.
- Impact of VA related infections with hospitalizations and death.
- Comparison of susceptibility to infections of different types of vascular access
- Identification of risk factors associated with vascular access infections.

METHOD

Study Population: 4,000 patients undergoing hemodialysis a two-year period in 26 dialysis centers, divided by type of vascular access (CVC, AVF, AVG).

Data Collected: - type of vascular access
 Number of infection episodes; number of vascular access related infections episodes.
 Microbial species isolated and antimicrobial resistance profile conducted.

RESULTS

- 4,000 patients included; 75% AVF (3,000 patients), 25% CVC (1,000 patients).
- Global rate of VA-related infections: **1.2 / 1,000 dialysis sessions.**
- VA-related infections occurred significantly more in **male patients** and patients with **diabetes.**
- Infection episodes significantly more frequent in CVC patients: **36% vs. 14%** (CVC vs. AVF), respectively.
- Main pathogens: ***S. aureus*** (incl. MRSA) 80%, *P. aeruginosa* 10%, *Klebsiella* spp 5%.
- VA infections associated with hospitalizations: **7%** of all hospitalizations caused by VA-related infections; **3%** of VA infectious events treated in hospital.

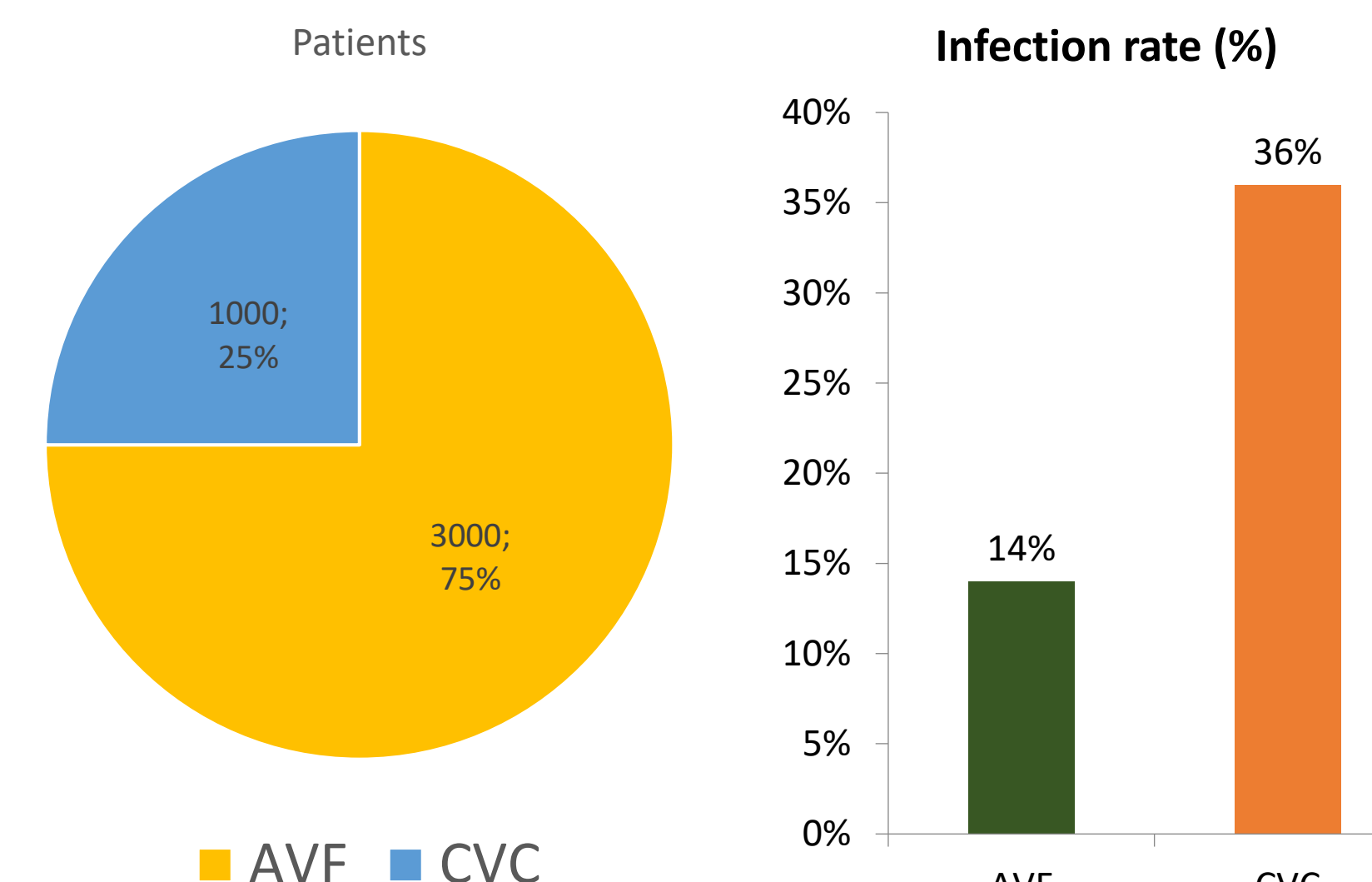


Figure 1. Distribution of hemodialysis patients by vascular access type (N=4,000). AVF = arteriovenous fistula; CVC = central venous catheter.

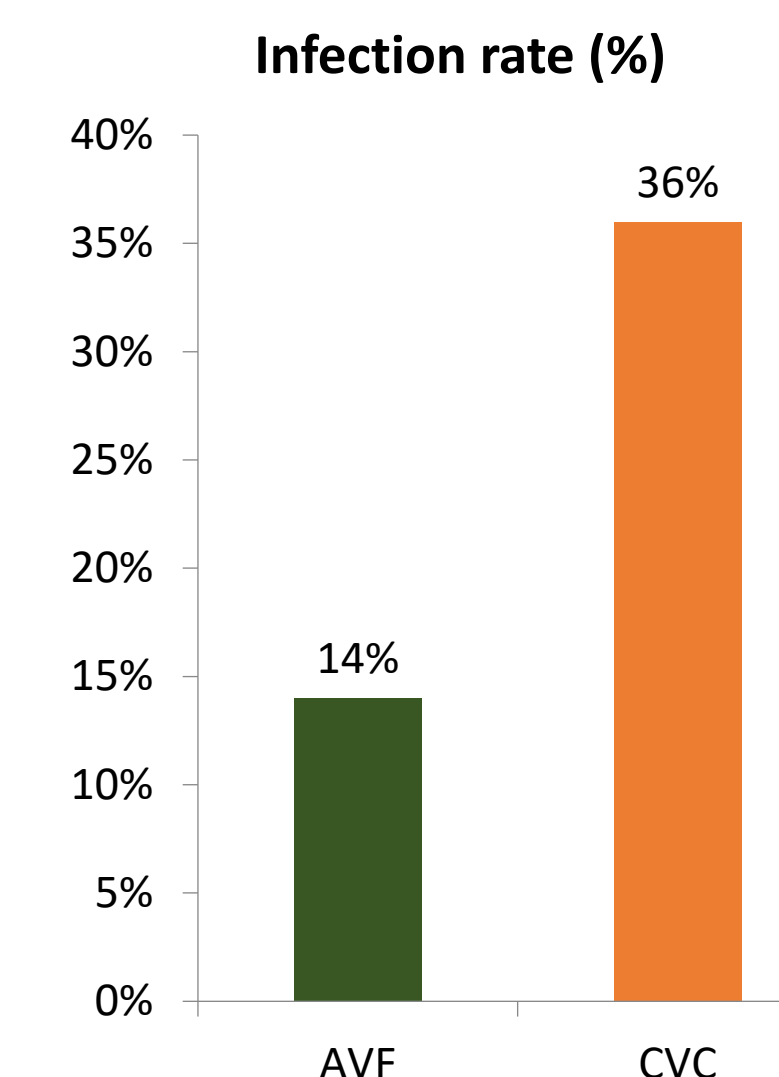
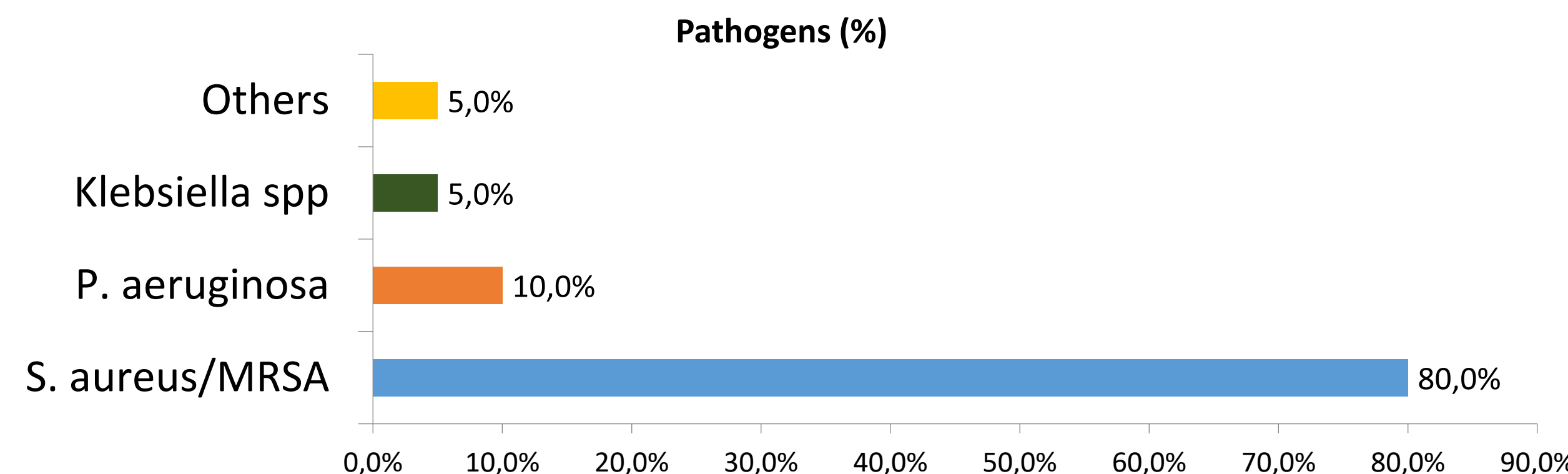


Figure 2. Infection rate (%) by vascular access type. CVC patients had significantly higher infection rates compared to AVF (36% vs. 14%, $p < 0.05$).



CONCLUSIONS

Even that the vascular access (VA) related infections represent a significant proportion of total infectious episodes, especially among patients with central venous catheters (CVC), the infection rate remained within acceptable standards due to robust preventive measures. These included strict aseptic techniques, patient and staff education, vaccination strategies, and a national antibiotic stewardship program. AVF remains the preferred VA method, and continued adherence to infection prevention protocols is essential to improve patient outcomes in dialysis care.

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