

# INFECTIONS OF CENTRAL VENOUS CATHETERS IN HEMODIALYSIS PATIENTS: RESISTANCE TO THE USUAL EMPIRIC ANTIBIOTIC TREATMENT A SINGLE CENTRE SEVEN YEARS EXPERIENCE

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## Introduction

Despite all efforts a considerable number of patients dialyses through central vein catheters (CVCs). Infections of CVCs remain an important cause of morbidity and mortality in this patient group.

## Patients and methods

We reviewed n=271 positive cultures taken from patients on hemodialysis carrying tunnelled or non-tunnelled CVCs in the last 7 years in our centre. Analysed were cultures of the tips of removed catheters as well as blood cultures taken through the dialysis catheters. Resistance to antibiotics used in daily clinical practice against CVC infections was evaluated.

## Results

Staphylococcal strains were isolated in 200 cases (73.8%). *S. aureus* was isolated in 17, *S. epidermidis* in 146 and other coagulase negative *Staphylococcus spp* in 37 patients (CNS, figure 1). Bacteria less frequently isolated were: *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Enterococcus faecalis*, *Enterobacter cloacae*, *Klebsiella pneumoniae* (figure 1). The susceptibility to commonly used antibiotics of the isolated staphylococcal strains is demonstrated in figure 2 and of the most frequently isolated gram negative bacteria in figure 3. According to the in vitro sensibilities, our usual empiric antibiotic treatment (combination of vancomycin with gentamicin) was expected to be effective in 93,7% of the cases. The addition of a cephalosporin or cinolone would not cover any of the resistant strains. Furthermore, the effectiveness of cephalosporins and cinolones was generally low against the isolated strains (for example: ceftazidime 29,9%, ciprofloxacin 44,8%). The strains resistant to the combination of vancomycin with gentamicin generally required specific treatment (for example colistin for multi-resistant *Acinetobacter baumannii* or *Pseudomonas aeruginosa* strains or antifungal agents for *Candida*). The susceptibility of *Staphylococcus spp* strains to vancomycin was comparable to teicoplanin, tigecycline, linezolid and daptomycin (figure 2). The minimum inhibitory concentration (MIC) of vancomycin was higher for *S. epidermidis* compared to other CNS or *S. aureus* ( $p<0.001$ , figure 4). Furthermore, the susceptibility of *S. epidermidis* to gentamicin was significantly lower (47,3%) compared to that of other CNS (76,0%) or *S. aureus* (71,4%,  $p<0.001$ ).

Figure 1

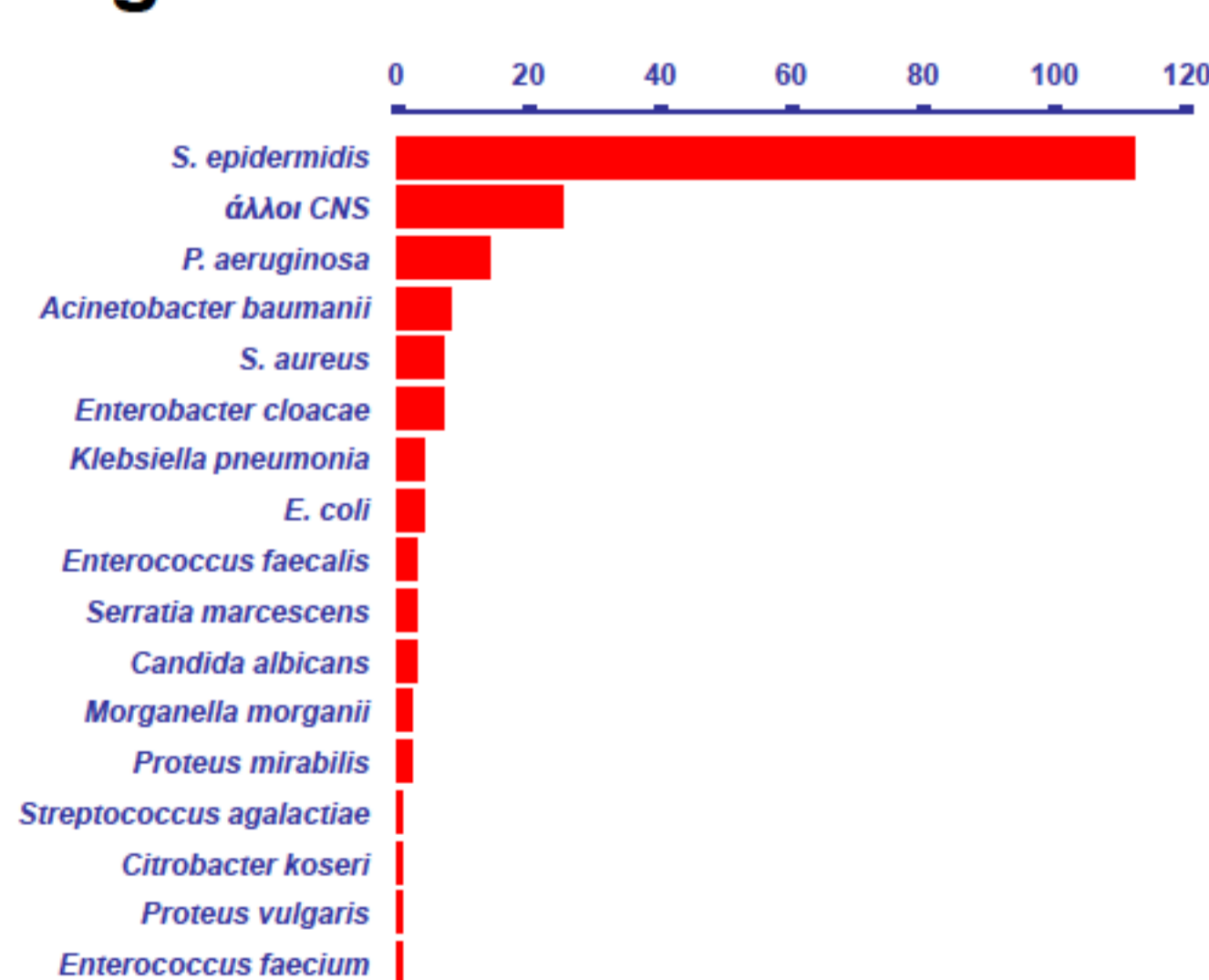


Figure 2

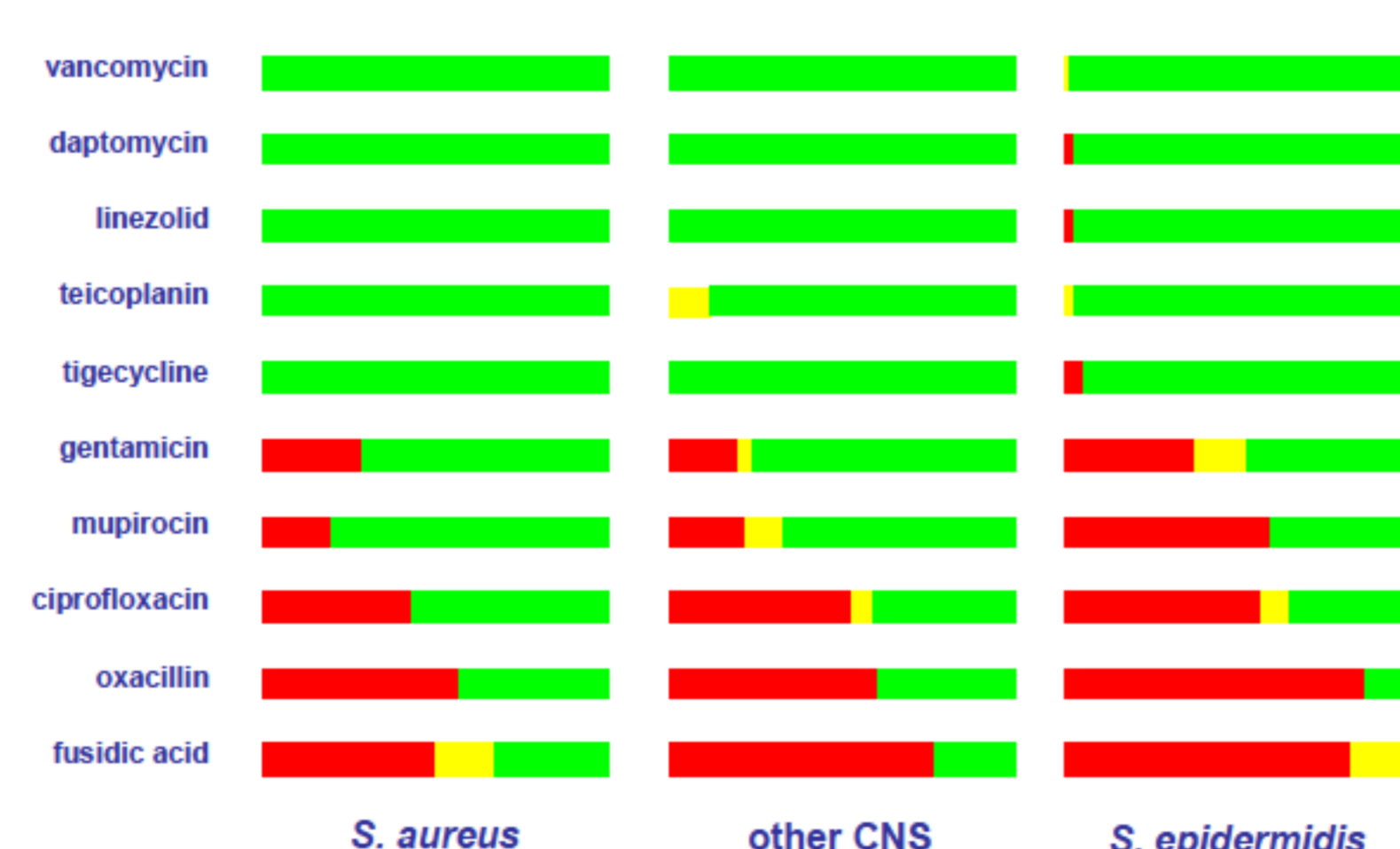


Figure 3

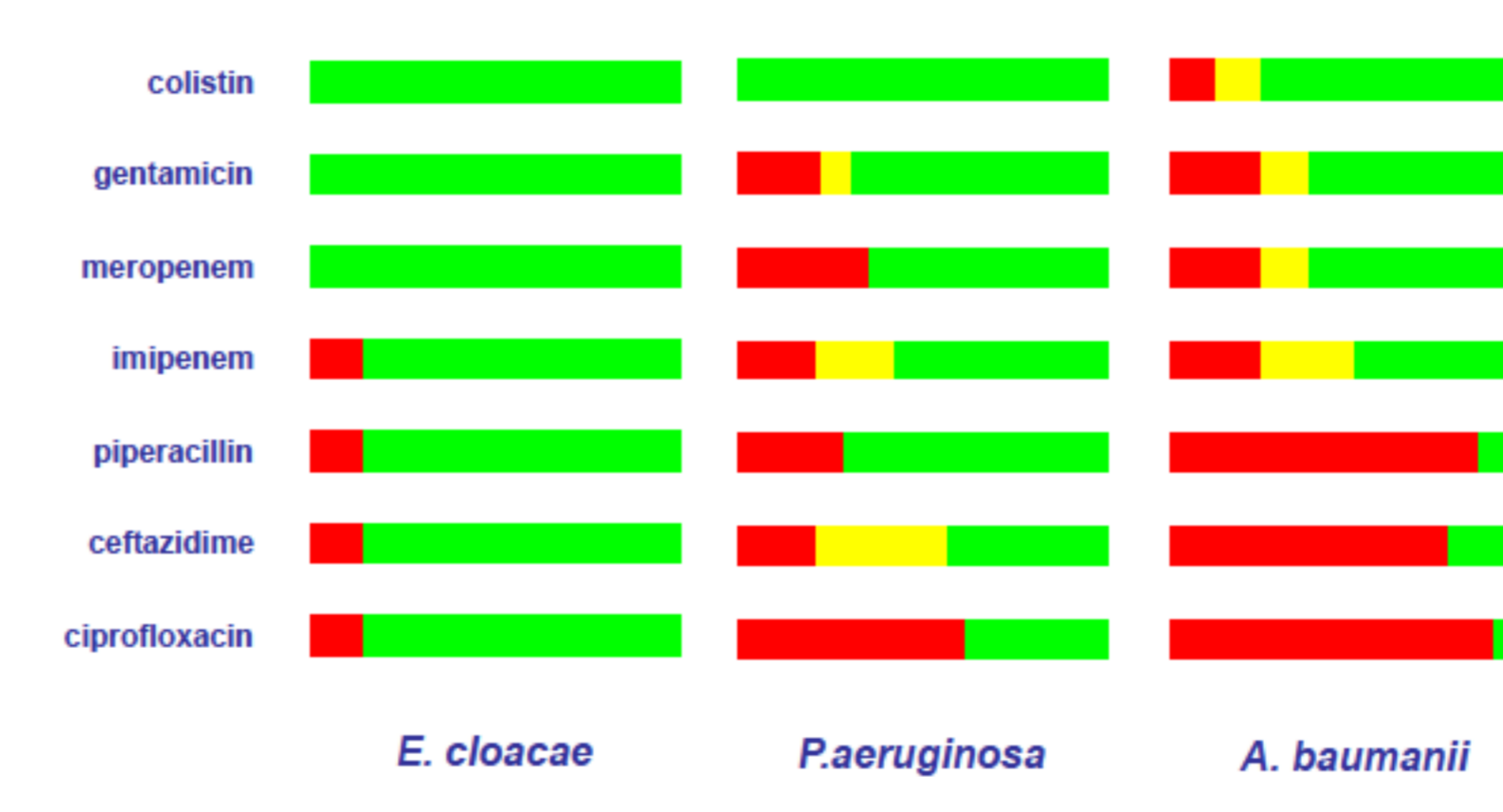
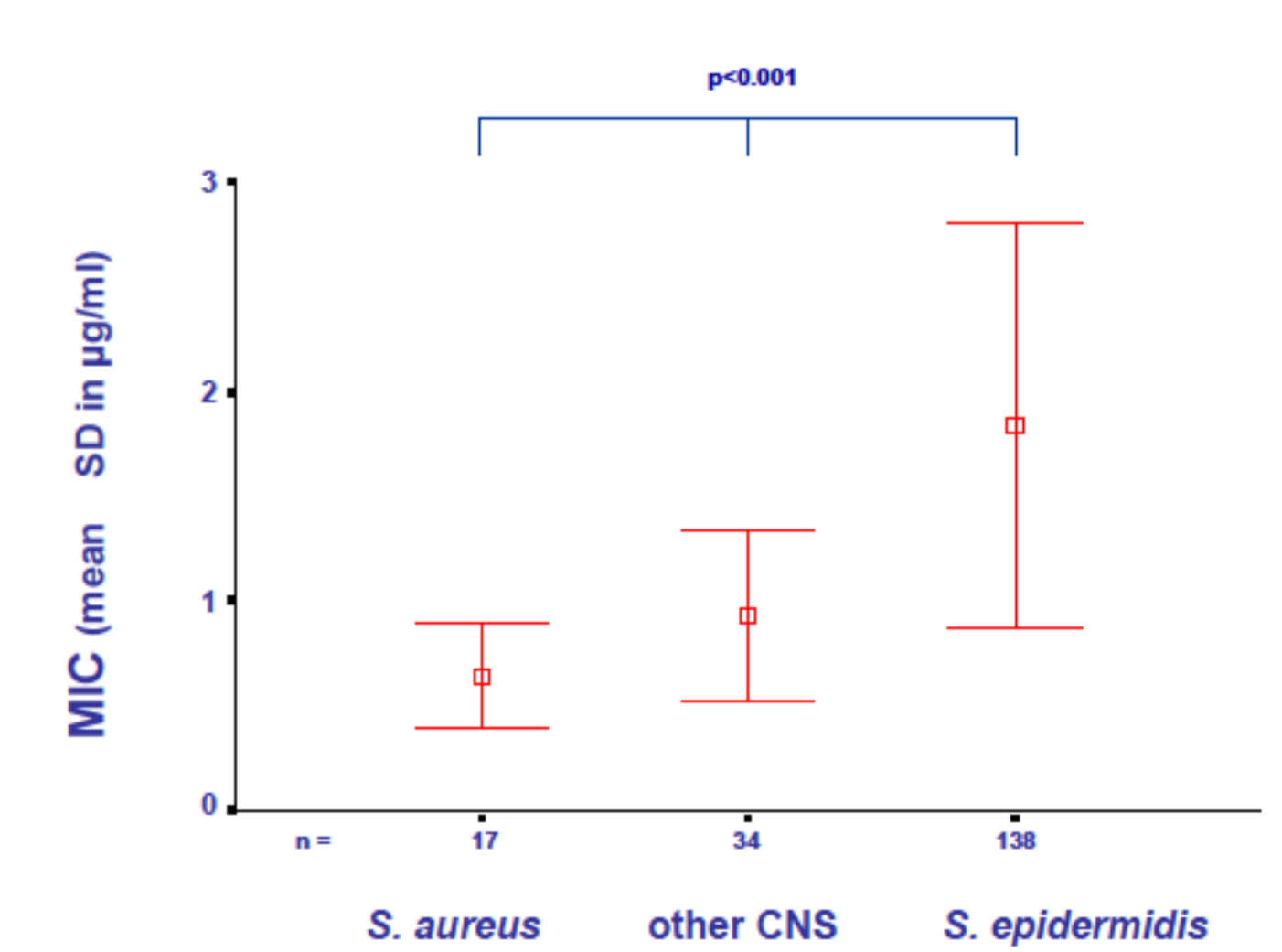


Figure 4



## Conclusions

*Staphylococcus spp* remains the major cause of CVC infections in dialysis patients but a growing number infections due to gram negative organisms is observed. Cases of resistance of staphylococcal strains to vancomycin or the newer antistaphylococcal agents are still rare. The combination of vancomycin with aminoglycosides remains a good choice for empiric treatment.