

Risk Factors for Invasive *Acinetobacter* Infections in Children: A Case-Control Study

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Background

- Acinetobacter infections in adults increasingly are nosocomial and multidrug resistant (MDR)
- Data in children are limited but suggest that Acinetobacter is emerging as a clinical pathogen
- Invasive Acinetobacter infections are relatively infrequent in children

Objectives

- Describe the epidemiology of Acinetobacter species colonization and infection in children
- Analyze the risk factors for invasion of Acinetobacter species in children

Methods

Single-center case-control study at a tertiary acute care children's hospital

Cases = Patients with invasive infection (INV)

INV defined as Acinetobacter isolation from sterile body sites, deep tissue, or in significant colony count in urine or bronchial lavage

Controls = Patients with noninvasive infection (non-INV)

Non-INV defined as isolation of Acinetobacter from upper respiratory culture or superficial skin/wound culture taken for clinical suspicion of infection and gram stain performed

- Patients with invasive and noninvasive Acinetobacter infections were identified from January 2008 through December 2015
- Only hospitalized patients were included in the study
- In pts with >1 isolate of Acinetobacter, only the first clinical episode was used for analysis
- MDR Acinetobacter was defined as resistance to at least 3 antimicrobials, with ≥1 agent in ≥3 drug classes
- Descriptive statistics were used for epidemiology and multivariate analysis with logistic regression used for risk factor analysis

Results

FIGURE 1. SPECIMEN SOURCE IN INVASIVE INFECTION (N=50)

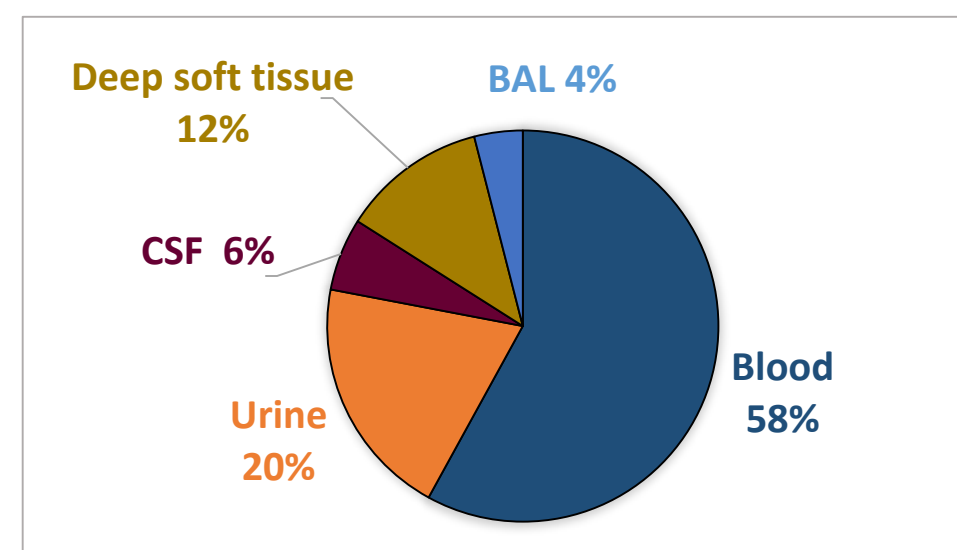
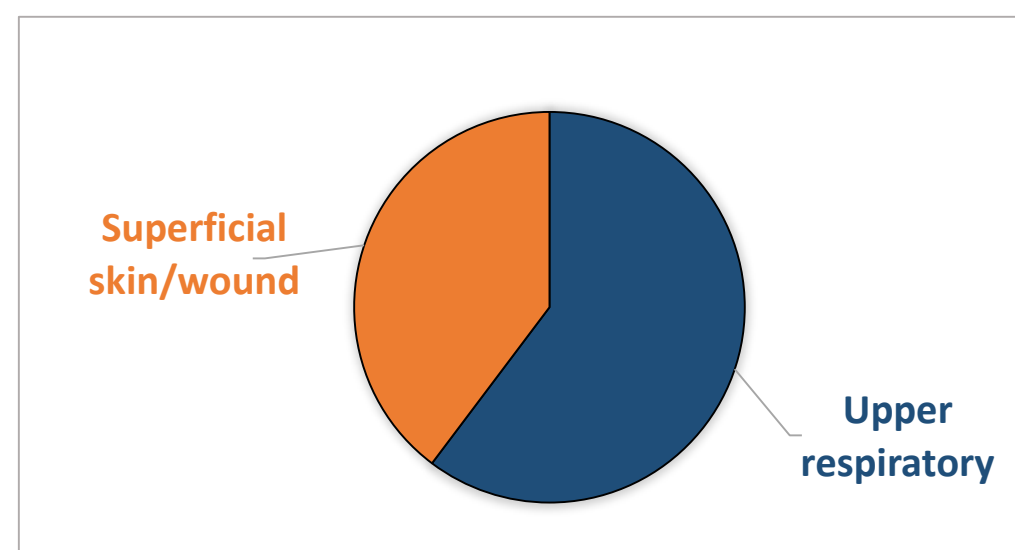
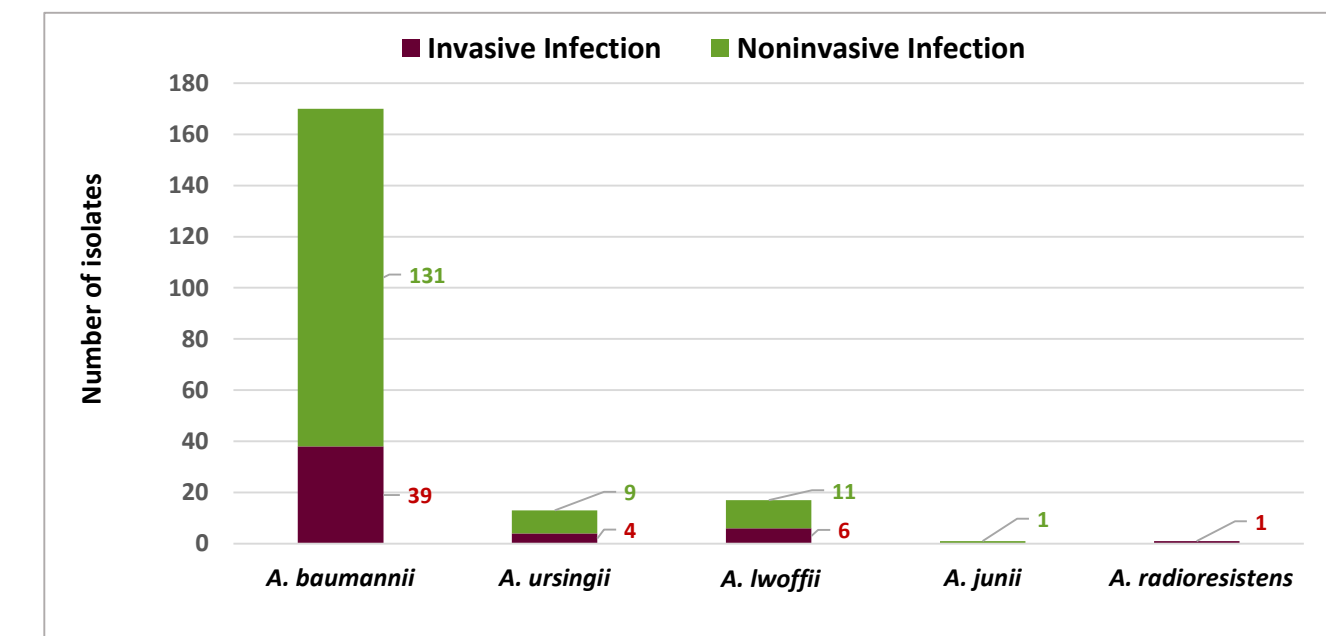


FIGURE 2. SPECIMEN SOURCE IN NON-INVASIVE INFECTION (N=146)



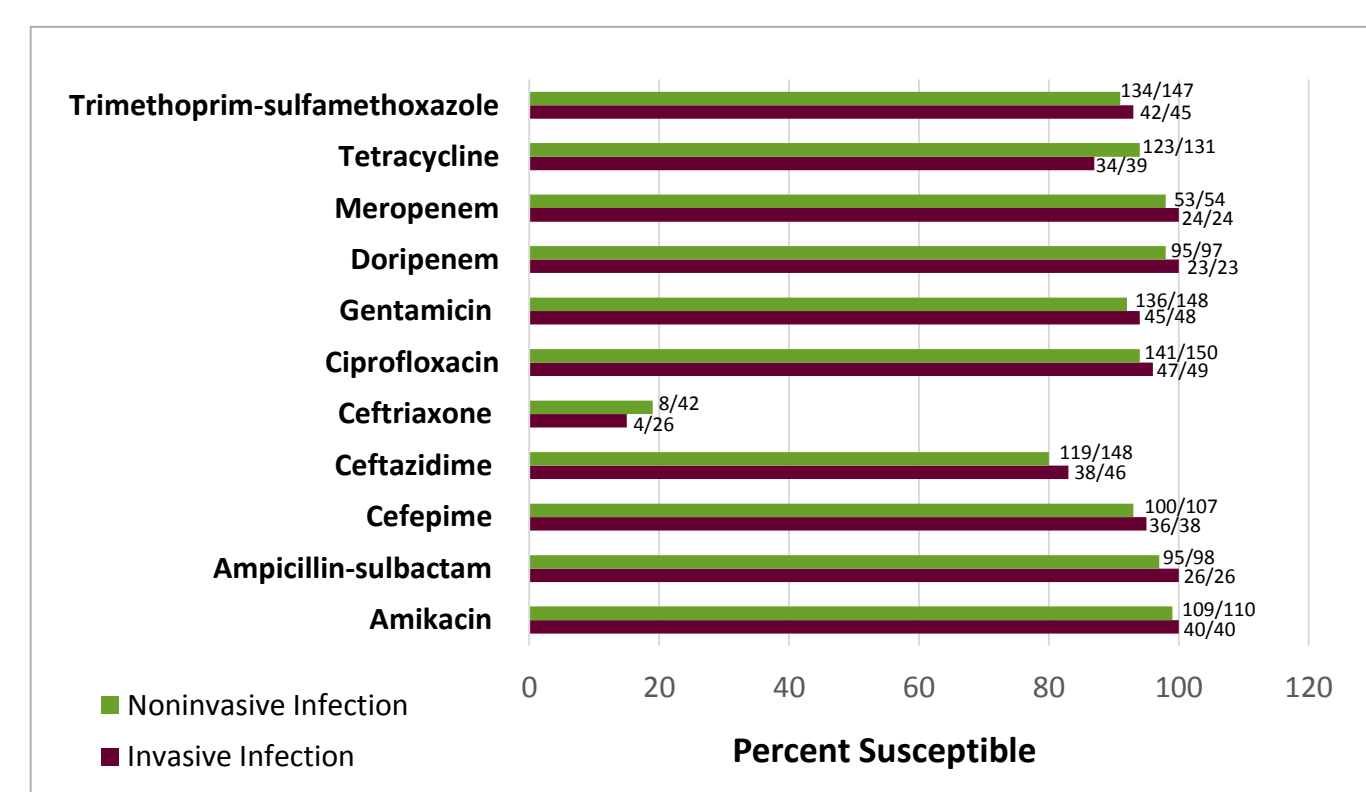
- 196 patients were included: 50 with INV and 146 with non-INV infections (Fig 1 & 2)
- Only one infection met NHSN criteria for health care associated infection (CLA-BSI)

FIGURE 3. SPECIES DISTRIBUTION OF ACINETOBACTER INFECTIONS



- 202 isolates were identified
 - 3 pts with non-INV infections had >1 species isolated
- Acinetobacter baumannii was most frequent species isolated (84%)

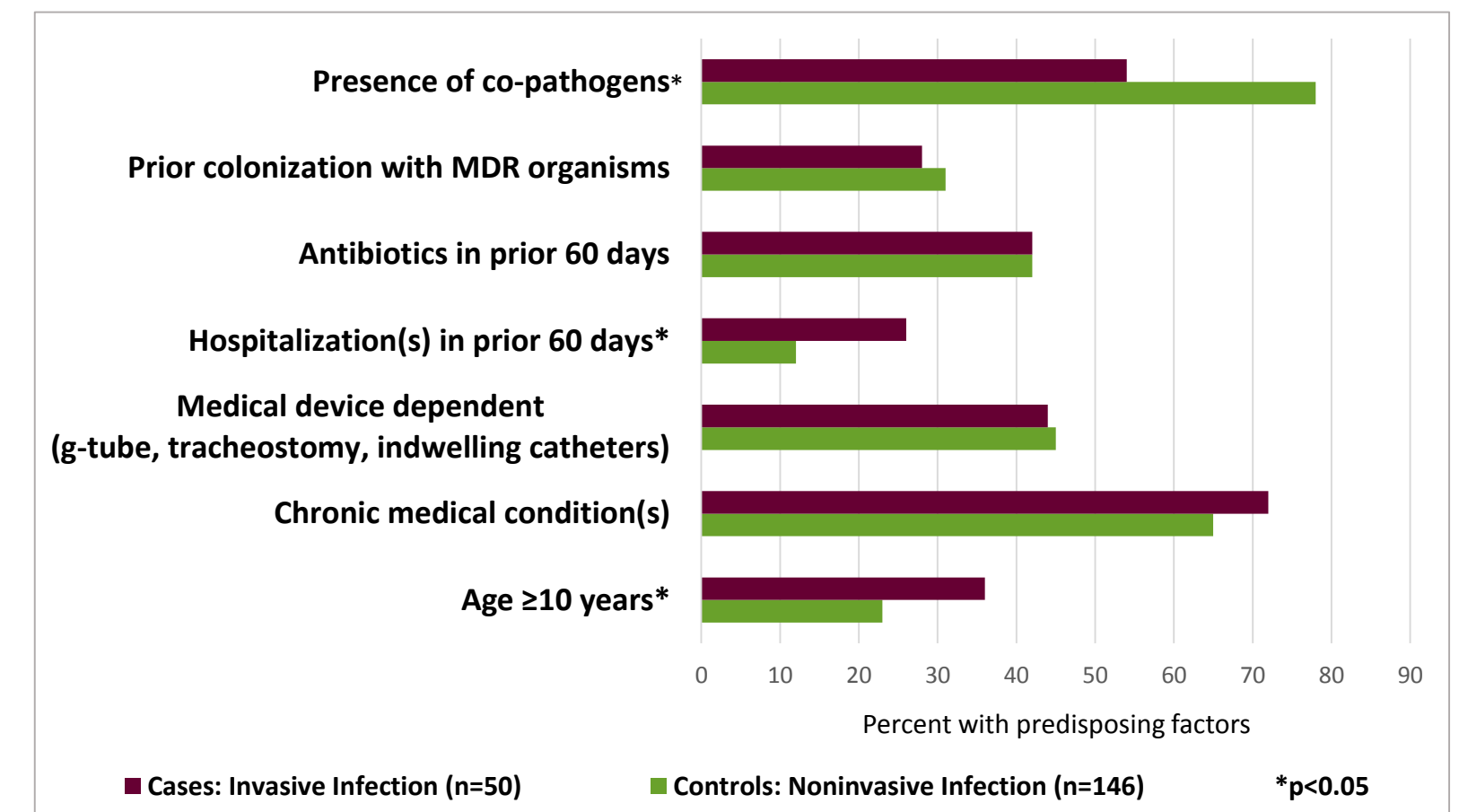
FIGURE 4. ANTIMICROBIAL SUSCEPTIBILITY OF INVASIVE AND NONINVASIVE ACINETOBACTER ISOLATES



Note: Susceptibility data reporting varied per isolate per drug over study period

- Antimicrobial susceptibility profiles were similar between case and control isolates
- Two isolates (non-INV) were carbapenem resistant
- 11 isolates were MDR (7 INV, 4 non-INV)

FIGURE 5. COMPARISON OF PATIENT CHARACTERISTICS FOR CASES AND CONTROLS



- Majority patients (INV and non-INV) had predisposing factors
- 90% with invasive infection had ≥ 1 identifiable risk factor

Multivariate analysis with logistic regression identified risk factors for invasive Acinetobacter infection

- Age ≥ 10 years $p=0.004$; OR 3.2 [CI 1.44-7.01]
- Hospitalization within prior 60 days $p=0.024$; OR 2.7 [CI 1.1 to 6.5]

Presence of > 1 pathogen in clinical specimen was associated with decreased risk of invasion $p=0.002$; OR 0.32 [CI 0.16 to 0.67]

Conclusions

- Acinetobacter infections (INV & non-INV) in children are not rare (196 in 8 years); 90% occur in healthcare-exposed patients
- Majority of isolates were not multidrug resistant
- Age ≥ 10 years and hospitalizations within prior 60 days were independent predictors of invasive Acinetobacter infection in children