

1579. Reduction of Antimicrobial Resistance among Gram- Negative Pathogens after Antimicrobial Stewardship in Three Tertiary Egyptian Hospitals

Amani El Kholy, MD¹; Samia A. Girgis, MD²; Mervat A.F. Shetta, MD³; Arwa Ramadan, MD⁴ and Dalia H. AbdelhHamid, MD²; ¹Clinical Pathology, Cairo University Medical School, Cairo, Egypt, ²Faculty of Medicine, Ain Shams University, Cairo, Egypt, ³Clinical Pathology, Ain Shams University Specialized Hospital, Cairo, Egypt, ⁴Faculty of Medicine, Cairo University, Cairo, Egypt

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Background. Antimicrobial resistance is an urgent healthcare threat. Monitoring and interventions to reduce antimicrobial resistance among Gram-negative rods (GNR) are essential.

Methods. The study was conducted over three years in three tertiary- care hospitals in Egypt during 2014- 2016. It included 578 GNR isolates from intra-abdominal infections (IAI), urinary tract infections (UTI) and respiratory tract infections (RTI). Identification of isolates was done by VITEK-2, and confirmed by MALDI-TOF at a central laboratory as part of Study for Monitoring Antimicrobial Resistance Trends (SMART). Susceptibility testing and molecular studies of resistance were conducted in the hospital laboratories. Starting from 2015, an antimicrobial stewardship (AMS) program was implemented in the 3 hospitals for fluoroquinolone restriction in empirical therapy, and early de-escalation of antimicrobial therapy.

Results. In Phase 1 (before AMS), 578 isolates of Gram-negative bacilli (GNB) were studied. Enterobacteriaceae comprised 66% of the total isolates. *K.pneumoniae* and *E.coli* were the most common (29.8% and 29.4%), followed by *Acinetobacter baumannii* (21.1%) and *P.aeruginosa* (9.9%). *K.pneumoniae* and *E.coli* were the predominant organisms in IAI (30.5% and 30.1% respectively) and UTI (and 38.9% and 48.6% respectively), while *Acinetobacter baumannii* was the most prevalent in RTI (40.2%). ESBL producers were phenotypically detected in 53% of *K.pneumoniae*, 68% of *E.coli* and 64% of *Proteus mirabilis*. Amikacin, imipenem, ertapenem and piperacillin/tazobactam had the highest susceptibility (60.7%, 58%, 49.3% and 46.5% respectively).

In Phase 2 (after AMS), 492 Gram-negative bacilli (GNB) were studied, showing similar distribution except for marked reduction in *Acinetobacter baumannii*(5.3% in IAI, 11.4% in RTI and 1% in UTI). ESBL continued to be high. Susceptibility to carbapenems increased to 87.1% for *E.coli* and 77.7% for all Enterobacteriaceae. PCR showed predominance of OXA-48- like (more than 50% and NDM (more than 40%), with low percentage of KPC2, VIM2 and IMP.

Conclusion. Our results show high ESBL and carbapenemases rates compared with the region that call for an urgent national AMS program and strict implementation of infection control measures.

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1580. Impact of an Antimicrobial Stewardship Initiative Focused on *Staphylococcus aureus* Bacteremia

Eric Gregory, PharmD¹; Katie Wallace, PharmD¹; Donna R. Burgess, RPh²; Aric Schadler, MS³ and David S. Burgess, PharmD, FCCP²; ¹University of Kentucky HealthCare, Lexington, Kentucky, ²University of Kentucky, College of Pharmacy, Lexington, Kentucky, ³University of Kentucky College of Pharmacy, Lexington, Kentucky

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Background. Data exists to support a mortality reduction from *S. aureus* bacteremia with adherence to evidence-based recommendations. Therefore, our Antimicrobial Stewardship Team instituted a guideline focused on *S. aureus* bacteremia management. This study outlines improvements achieved through the implementation at an academic medical center.

Methods. A quasi-experimental approach evaluated pre-implementation (2014–15) and post-implementation (2015–17) periods. The Antimicrobial Stewardship Team provided a detailed standardized note and management guidelines. Adult patients with *S. aureus* bacteremia identified by a rapid diagnostic system were evaluated. Patients were excluded if discharged within 48 hours of a first positive blood culture or transitioned to comfort care. The primary outcome was all-cause 30-day mortality and secondary outcomes were total guideline adherence (TGA) and appropriateness of therapy.

Results. Overall, 263 patients (105 pre-implementation; 158 post-implementation) were included. No significant differences were observed in baseline characteristics (e.g., age, gender, ethnicity); however, the mean Pitt Bacteremia score was significantly lower in the post-implementation group (2 vs. 1; $P = 0.01$). Although no difference was observed in all-cause 30-day mortality (13% vs. 15%; $P = 0.8$), improved TGA (29% vs. 44%; $P = 0.01$) and appropriateness of therapy (68% vs. 74%; $P = 0.26$) were noted while duration of bacteremia decreased (3.6 days vs. 2.8 days; $P = 0.02$) in the post-implementation period. In uncomplicated bacteremia, TGA (15% vs. 38%; $P = 0.02$) and adequate duration of therapy (54% vs. 77%; $P = 0.02$) significantly improved. In complicated bacteremia, TGA (36% vs. 48%; $P = 0.14$) and targeted agents utilized (92% vs. 100%; $P < 0.01$) increased post-implementation. Additionally, achieving TGA significantly reduced all-cause 30-day mortality in complicated (33% vs. 1.5%; $P < 0.01$) and uncomplicated (26% vs. 5.6%; $P = 0.01$) bacteremia for the entire sample.

Conclusion. The Antimicrobial Stewardship initiative significantly improved adherence to evidence-based guidelines for *S. aureus* bacteremia management. Though no impact on all-cause mortality was observed, a significant effect was noted when TGA was achieved.

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1581. The Value of Antimicrobial Stewardship Team (AST) in Conjunction with Infectious Diseases Consult in Reducing the 30-day Mortality of Patients with *Staphylococcus aureus* Bacteremia in a Single Academic Medical Center

Jacqueline Sherbuk, MD¹; Dayna Mcmanus, PharmD²; Jeffrey Topal, MD³ and Maricar Malinis, MD⁴; ¹Internal Medicine, Yale University School of Medicine, New Haven, Connecticut, ²Pharmacy, Yale New Haven Hospital, New Haven, Connecticut, ³Yale-New Haven Hospital, New Haven, Connecticut, ⁴FACP, Section of Infectious Diseases, Yale University School of Medicine, New Haven, Connecticut

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Background. *Staphylococcus aureus* bacteremia (SAB) is a common bloodstream infection with significant mortality. Infectious Disease consultation (IDC) has been shown to improve outcomes and adherence to standards of care (SOC). In our institution, IDC for SAB is not mandatory. Our study was a quality improvement initiative to measure the impact of IDC on patient outcomes and adherence to SOC.

Methods. A retrospective, observational study of all SAB cases in adults ≥ 18 years old at a 1541-bed academic medical center from January 1 to December 31, 2015 was performed. Those meeting inclusion criteria underwent chart review for demographics, co-morbidities, presence of IDC or antimicrobial stewardship team (AST) input, management including follow-up blood culture, echocardiography, antibiotic choice and duration, and outcomes including relapse and 30-day mortality.

Results. 236 patients met inclusion criteria and 174 (74%) had IDC. Patient characteristics were balanced in IDC and no IDC (NIDC) groups including age, sex, co-morbidities, methicillin-resistant SAB rates except for more immunosuppressed hosts, bone and joint infections, and endocarditis ($P < 0.05$) in the IDC group. SOC including performance of echocardiogram, appropriate antibiotic choice and treatment duration were adhered to more frequently in the IDC group ($P < .005$). Relapse rates were similar in IDC and NIDC groups (3% vs. 5%, $P = 0.44$, respectively). Lower 30-day mortality was observed with IDC but did not reach statistical significance (11% vs. 21%, $P = .07$). Patients with malignancy who had IDC had lower 30-day mortality compared with their counterpart in the NIDC group (6% vs. 35%, $P = .01$).

In the NIDC group, 9/62 (15%) had an AST input that provided recommendations on antibiotic management. When these cases were combined with those with IDC, mortality was significantly improved compared with those without either IDC or AST input (11% vs. 23%, $P = 0.04$). Multivariate analysis revealed bacteremia clearance within 3 days and presence of AST input or IDC were predictors of survival while age > 60 and ICU stay were predictors of mortality ($P < .005$).

Conclusion. Similar to prior studies, IDC was associated with increased adherence to standard management practices. Our study suggests that a pharmacy-driven AST can be an adjunct to IDC in improving outcomes of SAB.

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1582. Impact of an Unsolicited, Simple Standardized Form Based Antimicrobial Stewardship Intervention to Improve Guideline Adherence in the Management of *Staphylococcus aureus* Bacteremia

Shahileen Remtulla, B.Sc., B.Sc.(Pharm), PharmD¹; Karen Zurek, B.Sc.Pharm¹; Cristina Hernandez, MD²; Carlos Cervera, MD² and Holly Hoang, MD, FRCPC^{1,2}; ¹Covenant Health, Edmonton, AB, Canada, ²University of Alberta, Edmonton, AB, Canada

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Background. *Staphylococcus aureus* bacteremia (SAB) is associated with poor outcomes. The objective was to assess the impact of a pharmacist driven antimicrobial stewardship intervention on SAB management.

Methods. A multicenter, pre-post quasi-experimental design was used to compare pre-intervention (Oct 2014 – Sep 2015) and intervention (Oct 2015 – Sep 2016) periods in hospitalized SAB patients. The antimicrobial stewardship program (ASP) developed an evidence based SAB management bundle that included: Infectious Diseases (ID) consult, blood culture clearance, appropriate empiric and definitive antibiotics, echocardiography, adequate treatment duration, and infectious source removal if applicable. ASP pharmacists performed prospective audit and feedback (PAF) using a standardized form after review with the ASP medical director. The primary outcome was bundle component adherence. Secondary outcomes were length of stay, 30 day readmission, in-hospital mortality, and 30 day mortality.

Results. 127 patients were included (pre-intervention = 62, intervention = 65). The two groups had similar patient demographics. The intervention group had a higher rate of complicated SAB at diagnosis.

Bundle implementation with PAF resulted in significant improvements in ID consultation (56.5% vs. 92.3%, $P < 0.001$), appropriate definitive antibiotic dosing (83.9% vs. 100%, $P = 0.001$), ordering echocardiography (72.6% vs. 93.8%, $P = 0.001$), and adequate treatment duration (87% vs. 100%, $P = 0.009$). Overall bundle adherence increased by 43.3% ($P < 0.001$). Readmission and 30 day mortality decreased but did not reach statistical significance.