

1127. Utilization of Combination Anti-fungal Therapy in Hospitalized Children and Adverse Events

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Background. Combination antifungal therapy (CAF) is often prescribed to treat invasive fungal infections, despite equivocal data showing benefit. We evaluated number of CAF for treatment of proven, probable and possible invasive fungal infection (IFI) in hospitalized children, associated adverse effects (AE), and use of therapeutic drug monitoring (TDM).

Methods. Medical charts of patients ≤ 18 years old that received CAF for ≥ 72 hours with normal liver function test between 1/1/13 through December 31/18 were reviewed. Patients could be included for multiple episodes of CAF. Data included primary site of IFI, host risk factors, demonstration of fungal elements in tissue/sterile sites, clinical and mycological criteria for IFI (defined by European Organization for Research and Treatment of Cancer/Invasive Fungal Infections Cooperative Group and National Institute of Allergy and Infectious Diseases Mycoses Study Group), CAF regimen, incidence of TDM, and AE.

Results. Overall, 73 episodes of IFI were reviewed [unique patients (n) =60]. The median age was 10 years. Majority (61.6%) of patients were diagnosed with a hematological malignancy (n = 20 acute lymphoblastic leukemia, n = 12 acute myeloid leukemia, n = 5 aplastic anemia). A number of proven, possible, probable IFI were 36, 27 and 20, respectively (Table 1). Most frequent organism isolated in proven IFI was *Aspergillus fumigatus* (episodes=5, n = 4). Most common primary site of IFI was pulmonary (episodes=32, n = 27). Median days of CAF was 6.8 (range: 3–170). Sixty-six episodes included treatment with a triazole-containing regimen (90%). TDM was conducted in 51 (77%) episodes of triazole-containing regimens. AE were reported in 14 episodes (n = 10) (infusion-related reactions and nephrotoxicity reported in 4 episodes each, electrolyte abnormalities and skin reaction reported in 2 episodes each, and liver dysfunction and hypersensitivity reported in 1 episode each).

Conclusion. Patients diagnosed with proven or probable IFI received a longer duration of CAF in comparison to possible IFI. Voriconazole was frequently prescribed in combination with either micafungin or liposomal amphotericin B for IFI. Antifungal stewardship opportunities exist to improve TDM and reduce the incidence of AE when prescribing CAF.

Table 1: Antifungal therapy prescribed and duration of CAF for IFI

Type of IFI (n)	Anti-fungal in combination with liposomal amphotericin B: Number of episodes (%)	Anti-fungal prescribed in combination with micafungin: Number of episodes (%)	Median days of CAF
Probable (n=20)	Voriconazole: 5 (25)	Voriconazole: 8 (40)	8.5
	Posaconazole: 4 (20)		
	Itraconazole: 1 (5)	Posaconazole: 1 (5)	
	Micafungin: 1 (5)		
Possible (n=27)	Voriconazole: 5 (18.5)	Voriconazole: 16 (59)	5
	Posaconazole: 3 (11)	Isavuconazole: 1 (3.7)	
	Itraconazole: 1 (3.7)	Posaconazole: 1 (3.7)	
	Micafungin: 1 (3.7)		
Proven (n=36)	Voriconazole: 13 (36)	Voriconazole: 5 (13.8)	8
	Micafungin: 6 (16.6)	Fluconazole: 1 (2.7)	
	Itraconazole: 4 (11)	Posaconazole: 1 (2.7)	
	Posaconazole: 4 (11)	Conventional amphotericin B: 1 (2.7)	
	Fluconazole: 1 (2.7)		

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1128. Knowledge, Attitudes and Perceptions about Antibiotic Stewardship (AS) Programs among Neonatology Trainees

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Background. Antibiotic stewardship (AS) is a fundamental aspect of medical training. Neonatal Intensive Care Units (NICU) often have unique stewardship needs as they are ideal settings for the emergence and spread of drug-resistant bacteria. Assessing neonatology fellowship trainees' knowledge and perceptions will highlight deficits in AS education and inform future curriculum development.

Methods. Prospective electronic survey study, distributed by Accreditation Council for Graduate Medical Education (ACGME) program directors to neonatology fellows in the United States over 4 months (January to April 2018). The objective was to assess neonatology fellows' knowledge, attitudes and perceptions about AS to inform sustainable NICU-specific AS programs.

Results. Of 99 programs and 700 fellows, 159 respondents (23%) from 40 neonatology training programs (40%) responded to the survey and 139 (87%) provided complete responses. Respondents were equally spread across all 3 years of training

Seventy-two percent confirmed an institutional AS program existed, yet, only 33% were able to identify the components of AS programs and 66% either did not or were unsure if they had received AS training during fellowship. Furthermore, only 51% identified the appropriate empiric antibiotic for neonatal meningitis and 12% identified optimal methicillin-susceptible *Staphylococcus aureus* (MSSA) treatment while answering clinical case study questions. Notably, fellowship training year was not significantly related to the proportion of incorrect responses ($P = 0.40$).

Small group sessions were identified as the best teaching format (35%). This was followed by audit and feedback of individual prescribing behavior and didactic lectures which had an equal proportion of respondents (22%). Seventy-eight percent of respondents preferred a trainee-led AS program targeting necrotizing enterocolitis, antifungal prophylaxis and appropriate surgical prophylaxis.

Conclusion. Antibiotic stewardship is a critical part of physician training. While most institutions have a stewardship program, a dedicated curriculum incorporating small group sessions and didactics may be beneficial for educating neonatology trainees.

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1129. Assessment of Nurses' Views on Antimicrobial Stewardship at a Pediatric Hospital

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Background. Regulatory agencies strongly encourage the development of hospital-based antimicrobial stewardship (AS) programs (ASP) to support appropriate antimicrobial prescribing. One component of an ASP is a multidisciplinary team. While the initial conception centered on a physician and a pharmacist, including nurses in AS has been highlighted due to the nurse's vital role in patient care. There are little data on nurses' knowledge, attitudes, and practices in AS. The aim of this project was to determine ideas, concerns, and gaps in knowledge of bedside nurses at a local hospital level.

Methods. This project was conducted at an academic pediatric hospital in an urban setting. A survey was designed to obtain nurses' attitudes and views of AS and to address their frequency and confidence of various AS activities, including triage/isolation, allergy history, obtainment of appropriate diagnostic studies, interpretation of microbiology results, antibiotic de-/escalation, intravenous-to-oral switches of antibiotics, patient/family education, and identification of antimicrobial-associated adverse events. Respondents were asked to identify barriers to AS participation and to propose educational topics of interest. The survey was sent out to nurses, with 3 weekly reminders.

Results. 155 of 513 respondents initiated the survey (response rate 30.2%); however, 112 participants completed the entire survey (completion rate 72.3%). Of the respondents, 67% believed that nurses should provide AS but only 32% themselves provided AS; furthermore, 26% of the respondents felt that nurses were equipped to provide AS. The most frequent AS activity reported was patient/family education while the least reported activity was the interpretation of microbiology reports. A correlation was identified between frequency and confidence of performing various AS-related tasks ($R^2 = 0.95$). Barriers identified by respondents included antimicrobial knowledge, other timely priorities, and inclusion of nurses on bedside rounds.

Conclusion. Although few respondents felt prepared to provide antimicrobial stewardship, the majority (74%) were interested in learning more about how nurses could be involved. We are currently developing a nurse-centric educational curriculum based on the feedback from the survey.

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1130. Vancomycin Use in Pediatric Severe Sepsis at a Freestanding Children's Hospital

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Background. Surviving Sepsis Campaign guidelines recommend antibiotics be administered within 1 hour of severe sepsis (SS) onset, but do not suggest which agents to give. Vancomycin (VAN) is often chosen as empiric therapy for severe sepsis (SS) in children without evidence of the prevalence or risk factors for infections requiring VAN. As VAN is associated with significant nephrotoxicity, this study was performed to measure the risk-benefit ratio of empiric VAN use in pediatric sepsis.

Methods. This was a retrospective study of children with SS between 1/1/2015 to 6/30/2018 at the Women and Children's Hospital of Buffalo, as captured by billing data and sent to state Department of Health for mandated reporting. SS cases were assessed for risk factors for Gram-positive infections, including presence of a central venous line (CVL) or other invasive device; history of MRSA infection or nasal colonization within the last 2 years; skilled nursing facility (SNF) residence; and prolonged hospitalization