586. Multidrug-Resistant Organisms from Three Pediatric Inpatient Units in the Dominican Republic

David De Luna, MD, MSC; Alfredo J. Mena Lora, MD; Yori Roque, MD, MSC; Michelle López Franceschini, MD; Maria del Carmen Pérez, MD and Lizamarine Cabin, BCh; Pontificia Universidad Católica Madre y Maestra (PUCMM)/Hospital Metropolitano de Santiago (HOMS), Santiago, Santo de los Caballeros, Dominican Republic; ¹University of Illinois at Chicago, Chicago, Illinois; ²Pontificia Universidad Católica Madre y Maestra (PUCMM), Santiago, Dominican Republic

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Background. Multidrug-resistant organisms (MDRO) are a major global public health threat. Antimicrobial consumption and resistance in low- and middle-income countries (LMICs) are rising. This trend can be consequential for vulnerable populations such as children who have high rates of febrile illnesses. The aim of our study is to assess the burden of MDRO in hospitalized pediatric patients in the Dominican Republic (DR).

Methods. Retrospective review of all positive cultures in patients ages 0–17 years admitted to three tertiary referral centers in Santiago, DR. Culture-positive cases from January 2016 to December 2017 were reviewed. Repeat cultures from the same patient were excluded. Phenotypic susceptibility data were collected from automated susceptibility testing systems using VITEK2 platform.

Results. A total of 1,584 cultures were reviewed, of which 1,041 (65%) were Gram-negative and 514 (32%) Gram-positive. The most common microorganisms were E. coli (23%), S. aureus (11%), and Pseudomonas aeruginosa (2%). Phenotypic resistance consistent with extended-spectrum β-lactamase (ESBL) and carbapenem-resistant Enterobacteriaceae (CRE) was found in 524 (50.3%) and 179 (17.2%) of Gram-negatives, respectively. MDRO rates by organism are in Figure 2. A total of 72 (21.0%) S. aureus isolates were methicillin resistant (MRSA) and 62 (18%) showed susceptibility to vancomycin.

Conclusion. Data from automated culture systems suggests a high prevalence of ESBL and CRE in this city-wide cohort from three pediatric facilities. Prospective collection of susceptibility data and integration into antimicrobial stewardship targets and help curb antimicrobial pressure and resistance.

587. Risk Factors for Nosocomial Methicillin-Resistant Staphylococcus aureus (MRSA) Colonization in a Neonatal Intensive Care Unit (NICU): A Case–Control Study

Archana Balamohan, MD; Joanna Beachy, MD PhD; Nina Kohn, MBA, MA; and Lorry G. Rubin, MD; ¹Cohen Children’s Medical Center of New York, Northwell Health, Glen Oaks, New York; ²Cohen Children’s Medical Center, New Hyde Park, New York; ³Feinstein Institute for Medical Research, Northwell Health, Manhasset, New York; ⁴Cohen Children’s Medical Center of New York, New Hyde Park, New York

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Background. Staphylococcus aureus (SA) is a leading cause of nosocomial infections, with a high rate of antibiotic resistance. Colonization is a prerequisite for most SA infections. Prior studies have found that risk factors for colonization include the length of stay (LOS), multiple gestation, lower birth weight, location, and proximity to multi-bedded rooms. The objective of this study was to determine risk factors for MRSA colonization in a Level IV NICU independent of LOS and gestational age (GA) in the context of a circulating MRSA clone.

Methods. Weekly MRSA colonization cultures were performed from April 2017 through March 2018. Case–control study. Cases: Infants with newly acquired MRSA colonization and at least one previous negative culture. Controls: Infants with negative surveillance cultures, matched 1:1 with cases by GA and LOS. Factors compared: (a) neonatal demographics; (b) maternal factors; (c) neonatal factors since admission including antimicrobial therapy; (d) neonatal factors during the week prior to MRSA acquisition, including bed location, number of location changes, presence of central line, respiratory support, NICU census, ATIP surface bioburden testing rate, MRSA colonization pressure.

Results. 50 case infants were matched with controls. Forty-five of the 50 isolates were mupirocin-resistant and related by pulse-field gel electrophoresis. On matched univariable analysis, the following were significantly associated with a risk for MRSA acquisition: lower birth weight (P = 0.003); bed location in an acute area (P = 0.003); (2) having a higher level of respiratory support during the week prior to MRSA detection (P = 0.04); (3) higher MRSA acquisition rate during the week of and week prior (P = 0.01); (4) higher MRSA colonization rate during the prior week (P = 0.002), (5) Not having a hearing test during the time between the previous negative culture and MRSA acquisition (P = 0.001). A multivariable conditional logistic regression model (that excluded ATIP pass rate) found that only colonization pressure was associated with acquisition of MRSA colonization.

Conclusion. Independent of LOS and GA, MRSA colonization pressure, ATIP pass rate and higher patient acuity, reflected by location within the acute area and requiring respiratory support, are significantly associated with MRSA acquisition in the NICU; only colonization pressure remained associated in a multivariable model.

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588. Are Poplethial Vein PICCs safe for Neonates?

Harold L. Lochner, MD, MSc and Mobeen H. Rathore, MD; ¹University of Florida Jacksonville, Jacksonville, Florida; ²University of Florida, Jacksonville, Florida

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Background. Peripherally inserted central catheters (PICCs) have been used as an alternative to central venous catheters ever since first described in 1975. Concerns were voiced at our institution about safety of peripherally veined PICCs (P-PICCs) in neonates. There are no published data on the use of P-PICCs in neonates.

Methods. Retrospective review of records of all neonates admitted to a Level III NICU, 50-bed, level III Neonatal Intensive Care Unit between January 1, 2016 and December 31, 2018 who had PICCs placed. Records were reviewed for demographic data, number of days with PICC (dwell time), and complications. Complications included infectious such as bacteremia, insertion site infection; and mechanical such as occlusion, leakage, infiltration/edema, inadvertent dislodging, tip malposition, and cather breakage. Chi-square (C), non-paired independent-samples t test (T), or Mann–Whitney U test (MW) was used for statistical analysis. IRB approval was obtained from University of Florida (teaching institution) and Baptist Health (patient location).

Results. 830 PICCs inserted in 522 neonates were identified. 100 (12.0%) were P-PICCs and 730 (88.0%) were NP-PICCs. Of the NP-PICCs, 700/730 (95.8%) were placed in neonates with an average gestational age of 29 weeks vs. 32 weeks for NP-PICCs (P < 0.01, T) and P-PICCs were placed in neonates with average birthweight of 1,210 g vs. 1,840 g for NP-PICCs (P < 0.01, T). The average dwell time for P-PICCs was 15.4 days (range 2–79 days) compared with 14.2 days (range 0–109 days) for NP-PICCs (P = 0.02, MW). Infectious complications occurred in 5/100 (5.0%) of P-PICCs vs. 9/730 (1.23%) of NP-PICCs (P = 0.02, C) and mechanical complications in 13/100 (13%) P-PICCs vs. 75/730 (10.3%) in NP-PICCs (P = 0.39, C).

Conclusion. There was a significant increase in infectious complication rate between P-PICCs and NP-PICCs that necessitated PICC removal. There was a higher rate of complications overall with use of P-PICCs. This may be related to the increased proportion of lower birth weight and gestational age in the P-PICC group compared with the NP-PICC group. We intend to increase the patient numbers by adding data from 2019. Based on our review of previous P-PICCS we have increased risk of infectious complications and may not be as safe.

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