Presentation Type:
Poster Presentation

Leveraging the Electronic Medical Record to Identify Patients at Risk of Antibiotic Resistant Organisms

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Background: Carbapenemase-producing carbapenem-resistant Enterobacteriaceae (CP-CRE) pose a serious public health threat. The CDC guidelines for combating CP-CRE include a recommendation to screen selected high-risk patients. **Objective:** We describe a program to identify and screen patients at risk for CP-CRE. **Setting:** An academic, tertiary-care center with 1,297 licensed beds and 62,071 admissions per year. **Methods:** A report was created in the electronic medical record (EMR) to identify adult patients admitted in the previous 24 hours from countries and states with known CP-CRE transmission based on address and ZIP code. Patients with a known travel history outside the United States were also reviewed, but these data were inaccurate. Initially, a physician from Infection Prevention and Control (IPAC) placed orders for CP-CRE screening of these patients. Subsequently, a nursing protocol was developed to facilitate infection preventionists placing orders for CP-CRE screening earlier in the eligible patient's hospital stay. An electronic communication is sent via the EMR alerting the patient care team to the order, the rationale for the order, and links to a tool kit with resources to help answer patient questions. A single perirectal swab is obtained by the nurse caring for the patient and is tested for *Klebsiella pneumoniae* carbapenemase (KPC), New Delhi metallo-β-lactamase (NDM), oxacillinase-48 (OXA-48), and Verona integron-encoded metallo-β-lactamase (VIM) by polymerase chain reaction (PCR). **Results:** From May 2018 to November 2019, 688 patients were screened for CP-CRE using the case-finding report and the nursing protocol. Overall, 9 patients with CP-CRE were identified: 1 KPC, 2 NDM, and 5 OXA-48, and 1 patient was identified to have both NDM and OXA-48. The yield of 1.3% from this screening is higher than that reported previously in the literature. Use of the nursing protocol has enabled IPAC to complete timely CP-CRE surveillance and prevent transmission to other patients. We are currently using a similar process to identify and screen persons at risk for the emerging infection *Candida auris*. **Conclusions:** The EMR can be leveraged for early identification and screening of patients with epidemiologically significant pathogens. Protocols within the EMR can be effectively replicated and modified to respond to emerging infections and changing surveillance guidelines.

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Poster Presentation

Liberal and Restrictive Blood Transfusion Strategies in Orthopedic Surgery: Risk Factors for Surgical Site Infection

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Variable	Patient group: Not transfused (n=111)	Liberal strategy(n=98)	Restrictive strategy(n=34)	value-p
Preoperative time of definitive surgery (days)	8.8 (7.8)	9.4 (6.9)	10.4 (11)	0.636
Age years)	49 (19.6)	53.4 (26.5)	69 (19.2)	< 0.001
Duration of surgery (hours)	2.2 (0.9)	2.8 (1.3)	2.5 (1.2)	0.003
Number of comorbidities	1 (1.4)	1 (1.3)	2.5 (1.5)	< 0.001
Body mass index (BMI)	25.5 (4.8)	23.7 (4.7)	23.6 (5.1)	0.027
Previous hemoglobin	12.8 (1.8)	10.8 (2)	8.2 (1)	< 0.001
High hemoglobin	11.8 (2.3)	9.6 (1.5)	9.1 (1.5)	< 0.001
Previous leukogram	11 (3.8)	11.4 (5.3)	10 (4.5)	0,340
Previous PCR	54.7 (41.1)	96.8 (67.1)	77.7 (72.7)	< 0.001
Initial blood pressure (average)	97.6 (11.8)	97 (14.3)	100 (12.9)	0.428
Final blood pressure (average)	86 (11)	85.2 (11.5)	90.6 (9.5)	0.021
Intraoperative blood glucose (mean)	131.2 (50.9)	134.2 (35.7)	135.2 (36.4)	0.434
O2 saturation (average)	98.1 (1.9)	98 (1.8)	97.5 (1.9)	0.126

Table 1.

Variable	Logistic coefficient	S.E.	Odds Ratio	[95% C.I.]	p-value
Clean surgery	-1.696	0.568	0.18	[0.06; 0.56]	0.003
Average initial blood pressure (mmHg)	-0.054	0.022	0.95	[0.91; 0.99]	0.016
NNIS risk index	0.748	0.352	2.11	[1.06; 4.22]	0.034
Use of aspirin	2.604	0.766	13.52	[3.01; 60.67]	0.001
Use of amitriptyline	2.869	1.111	17.62	[2.00; 155.5]	0.01
Patient victim of run over or car accident	1.484	0.570	4.41	[1.44; 13.46]	0.009
Perioperative transfusion	1.546	0.578	4.69	[1.51; 14.55]	0.007
Repique	1.167	0.534	3.21	[1.13; 9.15]	0.029
Body mass index - BMI	0.121	0.051	1.13	[1.02; 1.25]	0.018
Constant	-1.294				

Table 2.

Background: The identification of risk factors for infections in surgical patients with lower-limb fractures and blood transfusions has increased in recent years. Surgical site infections (SSIs) increase hospitalization, care costs, and patient suffering. Correction surgery for lower-limb fractures and blood transfusion is quite common between surgical procedures. The aim of this study was to describe the relationship between blood transfusion and SSI in patients undergoing orthopedic surgery on lower limbs. **Methods:** We conducted a prospective cohort study to identify risk factors for SSI in blood transfused patients undergoing fracture repair in lower-limb surgeries between February 2017 and May 2019 in 2 reference tertiary-care hospitals in Belo Horizonte, a city of 3 million people in Brazil. Data regarding patient characteristics, surgical procedures, blood transfusions, and surgical infections were collected. Patient characterization was performed by calculating the absolute and relative frequencies of categorical variables and calculating mean, median, minimum, maximum, standard deviation, and coefficient of variation for quantitative variables. The incidence of surgical site infection, the risk of postoperative hospital death, and the total length of hospital stay were calculated by point estimates and 95% confidence intervals identified by statistical tests of bilateral hypotheses, considering the level of significance of 5%. A multivariate analysis (logistic regression) was performed to identify SSI risk factors. **Results:** Patients who had an indication for blood transfusion (n = 38) but who did not receive blood (n = 4) had significantly lower hemoglobin, comparing discharge with admission, than the group who received blood.

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Intraoperative transfusion was a risk factor for SSI (OR, 4.7) (Fig. 1). Among the 205 patients with no indication for transfusion, 98 received blood even without the indication: there was no difference in hemoglobin outcome when discharge and admission were compared, and the 98 patients were exposed to unnecessary risk. Regarding restrictive versus liberal transfusion strategies, there were differences in the variables, age ($P = .000$), duration of surgery ($P = .003$), number of comorbidities ($P = .000$), body mass index (BMI) ($P = .027$), previous hemoglobin ($P = .000$), and high hemoglobin ($P = .000$), considering the transfusion practice employed (Fig. 2). **Conclusions:** The indications for and definition of protocols and careful evaluation of blood transfusion are critical to avoid infectious complications in orthopedic patients with lower-limb fractures.
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Poster Presentation

Like a Bat Out of.... the Hospital? Development of a Bat Capture and Testing Protocol Prompted by Two Nosocomial Encounters

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Background: In the state of Wisconsin, 3%–4% of bats submitted for rabies testing are positive. Inpatient bat encounters at 2 affiliated healthcare facilities at nearly the same time were brought to the attention of the infection prevention and control (IPC) team. The first bat was captured in a patient room and was submitted for testing. Postexposure prophylaxis (PEP) was initiated for 1 patient before the bat testing results came back negative. The second bat was found in a transplant unit hallway and was released before we could request testing. We observed significant variations in responses, including decision to administer PEP and submission of bats for rabies testing. The IPC team developed a protocol to minimize unnecessary PEP, to prevent nosocomial rabies infection from bat exposure, and to limit associated panic. **Methods:** A systematic literature review of multiple databases was performed. A search of nonscientific articles using Google was also performed to assess unpublished inpatient bat encounters. A workgroup was established including IPC staff, physicians, and facilities management. The county animal services department and the state public health department veterinarian were consulted to aid in development of a protocol. **Results:** Literature review yielded a single report of a bat discovered in a neonatal intensive care unit (NICU). A lack of protocol resulted in PEP administration to 7 neonates without observed exposure after the bat was released instead of being submitted for testing. Of the first 100 articles retrieved via Google search of "bat in hospital," 9 pertained to nosocomial discovery of bats in 5 different states over the past 7 years. Encounters included infestations requiring unit shutdowns and PEP administration. One tertiary-care referral center reported 10 encounters per year but did not elaborate on associated procedures. The county animal services staff assisted in training maintenance and engineering services (MES) personnel on how to secure bats for testing and helped develop a "bat kit" with protective gear and equipment to do so safely. In the new protocol, an inpatient bat encounter prompts personnel to capture the bat and begin an investigation into known or potential occult exposure. Known or potential exposures merit submission of the bat for rabies testing, the results of which guide PEP recommendations. All encounters are investigated for point of entry or roost. **Conclusions:** Inpatient bat encounters are not uncommon. Encounters should prompt systematic assessment for exposures and an investigation of the root cause. Following a protocol may limit unnecessary PEP administration, prevent nosocomial transmission of rabies from bat to patient, and attenuate associated anxiety.
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Poster Presentation

Linezolid-Resistant *Staphylococcus haemolyticus*: Emergence of G2447U and C2534U Mutations at the Domain V of 23Sr RNA Gene

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Background: Linezolid an oxazolidinone drug available in both parenteral and oral formulations has emerged as a novel alternative to vancomycin and other second-generation drugs for the treatment of infections from gram-positive cocci. Clinical isolates of linezolid-resistant staphylococci and enterococci were reported. Since then, linezolid-resistant strains have become an increasing problem worldwide. The most frequently reported mechanisms of linezolid resistance include the mutation in 23S ribosomal nucleic acid and presence of *cfr* gene. Methicillin-resistant coagulase-negative staphylococci (MR-CoNS) and vancomycin-resistant *Enterococcus (V*RE) have become a worrisome clinical problem. **Objective:** Therefore, we aimed to determine the distribution of linezolid-resistant strains in an inpatient setting of a tertiary-care hospital in India and to evaluate the resistance mechanisms among these isolates. In addition, the clonal diversity of the isolates was determined by pulsed-field gel electrophoresis (PFGE). **Methods:** The distribution, clonal diversity, and resistance mechanism of linezolid resistant-*Staphylococcus haemolyticus* (LRSH) strains were determined. The isolates were identified by MALDI-TOF. The mechanism of resistance was determined by sequence analysis of the domain V of 23SrRNA and screening for *cfr* gene. Clonal relatedness was defined by PFGE. **Results:**

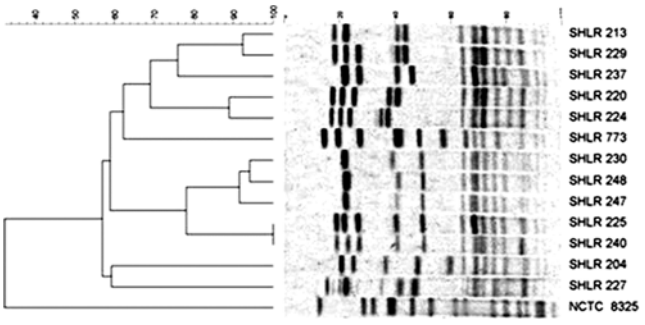

Fig. 1.