111. Impact of Microbiology Laboratory Result Presentation on Antibiotic Stewardship: Process Use Evaluation

Christina M. Brummett, PharmD, BCPS[1]; Stephanie Harding, PharmD, BCPS AQ-ID[1]; Kathy Beadle, MT(ASCP) MHCL[1]; Shelley Jones, MD[1]; [1]Wesley Medical Center, Bel Aire, Kansas

Session: P-4. Antimicrobial Stewardship: Diagnostics/Diagnostic Stewardship

Background: Advancements in laboratory diagnostics are constantly occurring and accuracy in interpreting results directly affects optimal patient care. The purpose of this process use evaluation was to assess the efficacy of our current presentation of microbiology results in facilitating appropriate clinical decisions and antibiotic stewardship.

Methods: A six question multiple choice survey was sent to prescribers and pharmacists. Each question used our healthcare system's current presentation of microbiology results. The recipients were asked to make a clinical decision based on patient history and results presented. The topics surveyed included de-escalation of antibiotics based on polymerase chain reaction (PCR) for positive blood cultures (Image 1), evaluation of *C. difficile* PCR and enzyme immunoassays (Image 2), impact of recent immunization on results of *S. pneumoniae* urine antigen (Image 3), susceptibilities of Group C *Streptococcus* and *H. influenzae* (Images 4 and 5), and understanding of minimum inhibitory concentrations (MIC, Image 6). The anonymous surveys were collected either electronically or by paper.

Image 1

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BLOOD CULTURE   Preliminary                          08/28/19-0932
    POSITIVE SMEAR          GRAM POSITIVE COCCI RESEMBLING STAPHYLOCOCCUS
    HOURS TO DETECTION      20:50

    POSITIVE SMEAR CALLED AT 0637, 08/27/19 BY WLAB.DEJ TO
    KELLY FELLS AT PHONE #360-2210 AND READ BACK.

    Organism 1              STAPH AUREUS PRESUMPTIVE MSSA
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Image 2

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CLOSTRIDIODES DIFFICILE DNA  Final                   07/18/19-1325
                            POSITIVE FOR CLOST. DIFFICILE TOXIGENIC B GENE BY PCR
    TOXIN A/B               NEGATIVE BY EIA
    NAP1                    027-NAP1-B1 PRESUMPTIVE NEGATIVE BY PCR
                            CONTACT PRECAUTIONS SHOULD BE IMPLEMENTED

    PCR+/ EIA TOX- patients are likely COLONIZED.  Treatment of
    these patients may not be necessary. Clinical correlation is
    required. Isolation precautions are required.
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Results: Several trends were seen in the 64 responses received (n, %). Questions with lab results containing detailed comments with guidance on how to interpret the results had the highest percentage of correct responses. This included our *C. difficile* (59, 92%) and *S. pneumoniae* urine antigen (61, 95%) results. Culture results with presumed susceptibilities and/or lack of guidance (*H. influenzae* (55, 86%); Group C *Streptococcus* (46, 72%)) had lower rates of correct interpretation and resulted in provider reluctance to de-escalate antibiotics. A similar trend was seen with the word "presumptive" on blood culture results by PCR (37, 58%). MICs were frequently misinterpreted as being able to compare activity between antibiotics (46, 72%).

Image 3

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AG STREPTOCOCCUS PNEUMONIAE  Final                   07/19/19-1141
                            POSITIVE FOR STREPTOCOCCUS PNEUMONIAE

    RECEIPT OF A PNEUMOCOCCAL VACCINATION WITHIN 5 DAYS PRIOR TO
    URINE ANTIGEN TESTING MAY RESULT IN A FALSE POSITIVE TEST.
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Image 4

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Organism 1                  STREPTOCOCCUS GROUP C
                            .HEAVY GROWTH
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Image 5

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RESPIRATORY CULTURE  Final
    Organism 1              HAEMOPHILUS INFLUENZAE
                            .LIGHT GROWTH
                            .BETA LACTAMASE NOT PRODUCED
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Conclusion: This study highlights that stewardship programs should focus on how lab results are reported and interpreted and should work with their microbiology lab to determine the presentation of results. Additions of detailed interpretations to Microbiology results may lead to improved de-escalation and antibiotic selection.

Image 6

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1. ESCHERICHIA COLI
                MIC     INTERPRETATION  ROUTE  AVERAGE ADULT DOSE
                ------- --------------- -----  ------------------
AMPICILLIN      <=2     S               IV     Cont Infus per Order #547
                        S               PO     AMOXICILLIN 500 MG Q8H
AMP/SULBACTAM   <=2     S               IV     3 GM Q6H
CEFAZOLIN       <=4     S               IV     1 GM Q8H
CEFEPIME        <=1     S               IV     1 GM Q6H
CEFTRIAXONE     <=1     S               IV     1 GM Q24H
GENTAMICIN      <=1     S               IV     7 mg/kg (IBW) Q24H
NITROFURANTOIN  <=16    S               PO     100 MG Q12H
PIP/TAZO        <=4     S               IV     3.375 G Q8H
TRIMETH/SULFA   <=20    S               PO     1 DS Q12H; MRSA 2 DS Q12H
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112. Impact of Respiratory Viral PCR Panels (RVP) and Serum Procalcitonin (PCT) on Antibiotic Days of Therapy (DOT) in Patients Admitted with Lower Respiratory Tract Infections (LRTI)

Anastasia Bilinskaya, PharmD[1]; Joseph L. Kuti, PharmD[2]; Kristin Linder, PharMD[1]; [1]Hartford HealthCare, Newington, Connecticut; [2]Center for Anti-Infective Research and Development, Hartford Hospital, Hartford, Connecticut

Session: P-4. Antimicrobial Stewardship: Diagnostics/Diagnostic Stewardship

Background: IDSA advocates for the use of RVP and PCT to reduce inappropriate antibiotic use. These assays were implemented in our health system without formal antimicrobial stewardship intervention. Herein, we evaluated assay utilization and impact on antibiotic DOT in patients admitted with LRTI.

Methods: Records of patients admitted to our health system in January 2019 with a diagnosis of LRTI (ICD 10 codes: J13-22, J44, or J85) were reviewed. Patients < 18 years old, receiving active treatment at time of admission for a concurrent infection, or had a RVP or initial PCT ordered > 48 hours from admission were excluded. Patients were cohorted based on at least one test ordered (VPPC) vs neither (CTRL). The primary endpoint was total antibiotic DOT, including inpatient and outpatient. Secondary endpoints were hospital length of stay (LOS), 30 day readmission (30DR), and all cause mortality (ACM). Multivariate linear regression was used to determine variables associated with DOT.

Results: Of 294 patients included, 15 (5.1%), 84 (28.6%), and 43 (14.6%) had RVP alone, PCT alone, or both ordered, respectively, resulting in 142 (48.3%) patients in the VPPC group. Providers modified therapy based on PCT and RVP results in 39.4% (50/127) and 33.3% (7/21) of patients, respectively. Median (IQR) DOT was similar between VPPC and CTRL groups (7 [5–9] vs 7 [3–8] days; p=0.159), respectively. Inpatient DOT (4 [2–5] vs 3 [2–4] days; p=0.001) and LOS (99.5 vs 81.7 hours; p=0.001) were longer in the VPPC group. VPPC patients were more likely to receive anti-pseudomonal B-lactams (anti-PSA) (26.8 vs 16.4%; p=0.044) and anti-MRSA antibiotics (45.1 vs 34.9%; p=0.096). No difference in 30DR (13.4 vs 15.1%; p=0.793) or ACM (2.1 vs 3.3%; p=0.794) was observed. Variables significantly associated with increased DOT were non-ICU admission, positive chest X-ray, LOS, younger age, and receipt of anti-MRSA or anti-PSA antibiotics.

Conclusion: Over one month, RVP or PCT was ordered in nearly half of admitted LRTI patients in our health system, but modification of therapy based on results was infrequent. The unrestricted use of these tests without stewardship intervention did not impact overall antibiotic DOT, LOS, 30DR, or ACM. These data emphasize the need for additional intervention to enhance the clinical utility of these tests.

113. Impact of Urinalysis with Reflex to Culture on Antimicrobial Prescribing Patterns for Patients with a Positive Urine Culture

Nicolette Diehl, PharmD[1]; Daohai Yu, PhD[2]; Jason C. Gallagher, PharmD, FIDP, FCCP, FIDSA, BCPS[1]; Kaede V. Sullivan, MD[2]; Daniel Mueller, MD[3]; Xiaoning Lu, MS[2]; Marissa Cavaretta, PharmD[1]; [1]Temple University, Philadelphia, Pennsylvania; [2]Lewis Katz School of Medicine at Temple University, Philadelphia, Pennsylvania; [3]Temple University Hospital, Philadelphia, PA

Session: P-4. Antimicrobial Stewardship: Diagnostics/Diagnostic Stewardship

Background: Temple University Hospital recently implemented a protocol in which a urinalysis will reflex to culture only in the presence of pyuria. The purpose of this study is to compare appropriate antimicrobial use for patients with positive urine cultures before and after implementation of the urinalysis with reflex to culture protocol.

Methods: This is a single center, observational chart review. Adult internal medicine patients with a urinalysis and positive urine culture before and after the intervention were included in the pre- and post-intervention groups. Patients in the intensive care unit, undergoing urologic or surgical procedures, with leukopenia, being treated for another infection, who were discharged within 72 hours of the urine culture order, or pregnant were excluded. The primary endpoint was the percentage of patients with appropriate antimicrobial management of the positive urine culture before and after implementation of the protocol. Appropriate management was defined as antimicrobial treatment for a symptomatic urinary tract infection or no antimicrobial treatment for asymptomatic bacteriuria. Duration of therapy was also assessed. A sample size of 334 cultures was needed to detect a 15% difference in initiation of antibiotics between groups. Comparisons of categorical variables were analyzed by Chi-Square/Fisher exact test while continuous variables were analyzed by Wilcoxon test.

Results: Patient characteristics and outcomes are listed in the tables below.

Table 1: Patient Characteristics

Characteristic	Pre-intervention N=167	Post-intervention N=167	Overall N=334
Male gender, n (%)	60 (35.9%)	58 (34.7%)	118 (35.3%)
Age, median (IQR) years	68.0 (52.0-76.0)	64.0 (55.0-75.0)	66.0 (53.0-76.0)
Immunocompromised, n (%)	38 (22.8)	33 (19.8)	71 (21.3)
Catheter, n (%)	81 (48.5%)	87 (52.1%)	168 (50.3%)
Treated with antibiotics, n (%)	142 (85.0%)	144 (86.2%)	286 (85.6%)