A Preview of Clinical Practice Guideline Updates

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IN a highly attended session at IDWeek 2023 in Boston, Massachusetts, USA, speakers provided a sneak preview of the eagerly anticipated updates to clinical practice guidelines in infectious diseases. Chaired by Sara Rogers, Infectious Diseases and International Medicine Associates, Albuquerque, New Mexico, USA, and Kirthana Beaulac, Emerson Hospital, Concord, Massachusetts, USA, the session specifically focused on updates to the clinical management of complicated urinary tract infections (UTI), intravascular catheter-related infections, and community-acquired pneumonia in infants and children. It is important to note that the guidelines are yet to be published, and are therefore subject to change.

COMPLICATED URINARY TRACT INFECTIONS

Barbara Trautner, Baylor College of Medicine, Houston, Texas, USA, presented the inaugural clinical practice guidelines for treating complicated urinary tract infections (cUTI). Following a literature search focusing on patient-important outcomes, authors gathered evidence from publications between 2008–2023.

The previous definition of uncomplicated UTI and acute pyelonephritis was limited to include only healthy, non-pregnant, afebrile females, with no diabetes or urologic abnormalities. Everything else was considered 'complicated'. However, this did not accurately reflect clinical practice, as factors like tissue invasion outside the bladder were excluded. Thus, the new definition of cUTI includes all infection beyond the bladder, encompassing pyelonephritis, catheter-associated UTI, and febrile bacteremic UTI, with everything else categorized as an uncomplicated UTI.

The purpose of these guidelines is to aid all practitioners in choosing an empiric agent for the treatment of cUTIs at the point of care. To illustrate this, the case of a 68-year-old female without a urinary catheter was presented. The patient was admitted with a week of suprapubic pain and urinary frequency that had progressed over the past 48 hours to include fever, chills, and altered mentation. She previously received ceftriaxone for levofloxacin-R *Escherichia coli* pyelonephritis, and was allergic to penicillin. Her vital signs were a temperature of 38 °C, blood pressure of 110/60, respiratory rate of 22, and pulse rate of 110. Urine microscopy showed pyuria and bacteriuria.

The guidelines dictate that the patient must first be assessed clinically to identify the presence of sepsis, as this diagnosis dictates all subsequent decisions due to a higher mortality in a septic patient, with a smaller margin for error when selecting the empiric therapy. The patient was diagnosed with cUTI and sepsis, due to a Sequential Organ Failure Assessment (SOFA) score of greater than 2. Step two of the guidelines involves the identification of risk factors for uropathogens resistant to specific antimicrobial agents. Prior cultures will aid in this, along with the knowledge of fluoroquinolone exposure in the last 12 months. Step three considers patient-specific factors: whether the patient has any allergies, a risk of a *Clostridium difficile* infection,

drug–drug interactions, contraindications, or a preferred route of delivery. Again, referring to the case presented, previous exposure to fluoroquinolone and a penicillin allergy ruled out piperacillin-tazobactam and fluoroquinolones as treatment options, leaving cephalosporins and carbapenems. Step four considers the antibiogram, a step only relevant to patients with sepsis. Despite limited evidence, the guideline development team decided that antibiogram use was appropriate as an additional safety measure in patients with sepsis, as the potential damage caused by inappropriate therapy is only modest. The patient had *E. coli* most recently, and therefore, this is the focus of step four. Fortunately, more than 80% of the *E. coli* are susceptible to the available drugs in this antibiogram. Ceftriaxone or ertapenem would be appropriate in this case based on patient history and allergies, and the patient received empiric therapy of intravenous ceftriaxone 2 g daily. On Day 3, she was afebrile, with normal vitals, labs, and mentation.

Nicolas Cortes-Penfield, University of Nebraska Medical Center, Omaha, USA, continued, discussing the appropriate duration and route of further treatment. Cortes-Penfield stressed that reduced treatment duration is recommended if clinical improvement is observed. In the presented case, the patient was stable, afebrile, and did not demonstrate evidence of abscess or obstruction needing source control. The patient was therefore ready for oral switch to an appropriate oral agent. Regarding the duration of therapy, evidence suggests 7 days is appropriate for pyelonephritis and Gram-negative bacteremia that has promptly resolved, rather than longer courses. As such, per os trimethoprim-sulfamethoxazole was advised for a further 4 days in this case, resulting in a total of 7 days of treatment. Cortes-Penfield concluded by stressing that the algorithm is not a substitute for your clinical judgement, due to several limitations in the data available, and the need for an individualized plan for some patient groups.

INTRAVASCULAR CATHETER-RELATED INFECTIONS

Nasia Safdar, University of Wisconsin–Madison School of Medicine and Public Health, USA, presented the case of a 50-year-old male with a history of short bowel syndrome, and a long-term triple lumen venous catheter in place for the last 3 months. He presented with fever, chills, lack of appetite, and general malaise. His vital signs were a temperature of 38.9 °C, blood pressure of 102/64, a respiratory rate of 18, and a pulse rate of 110, while a physical assessment suggested the catheter site looked okay, with no rash. This case spotlighted the workflow of the draft clinical practice guidelines for the diagnosis and management of intravascular catheter-related infections, with the rationale behind each recommendation discussed.

Using the Population, Intervention, Control, and Outcomes (PICO) framework, clinical questions were explored and linked to each stage of the draft recommendations. The first clinical question explores the impact on the patient of drawing blood through an intravascular catheter (IVC) filter alone, compared with a central venous catheter and percutaneously drawn blood. Based on the draft recommendations, peripheral and IVC blood cultures should be obtained simultaneously, so this patient underwent further lab testing, and blood cultures were considered from all lumens of the multi-lumen catheter. After 24 hours, blood cultures were growing coagulase-negative *Staphylococcus*, while peripheral cultures were negative at that timepoint, and thus systemic antibacterial therapy would commonly be started. However, when considering patient-important outcomes and the draft recommendations, in patients with positive blood cultures with coagulase-negative *Staphylococcus* spp. and no evidence of sepsis or hemodynamic instability, monitoring without systemic antimicrobials is recommended. Starting therapy of systemic antimicrobials is only recommended in patients with retained IVC and known pathogens.

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In the discussed case, due to hemodynamic instability, vancomycin was started, and the IVC was removed. The patient responded well, but contrary to the UTI guidelines, there is no tangible evidence regarding the recommended duration of therapy. Based on weak evidence, systemic antibiotics are recommended for 2 weeks in patients with uncomplicated catheter-related bloodstream infections who have had the IVC removed. However, there is more substantial evidence regarding guidewire exchange, with the draft recommendations suggesting guidewire exchange for an antimicrobial-impregnated catheter if available, and this recommendation is made irrespective of device type.

COMMUNITY-ACQUIRED PNEUMONIA IN INFANTS AND CHILDREN

Complicated pneumonia is defined as a pulmonary parenchymal infection complicated by a range of comorbidities, with the final presentation focusing on parapneumonic effusions and empyema. Kwabena Ampofo, University of Utah School of Medicine, Salt Lake City, USA, presented an update to the 2011 guidelines, focusing on radiographic evaluation of pleural effusion, drainage, and intrapleural fibrinolytics.

Continuing the theme of case-based learning, a 3-year-old boy with no medical history was presented. The patient developed an upper respiratory infection 10 days before admission, that lasted 3 days. Five days later, he developed a fever of 40 °C, before developing a cough and chest pain after another 2 days. On the day of admission, he developed labored breathing, and was evaluated in the emergency department. His vitals were concerning, and indicative of fever. A chest X-ray revealed left lower lobe pneumonia, associated with large pleural effusion, and patchy opacity in the right perihilar region, which could represent infection or atelectasis.

The draft recommendation in this case is to obtain a chest/lung ultrasound as a first-line diagnostic modality, to be substituted with a CT when this is not available. In the discussed case, a chest ultrasound was performed, identifying multiple septations and loculations. To relieve the patient of chest pain, chest tube drainage and intrapleural fibrinolytics (CTF), rather than video-assisted thoracoscopic surgery, is recommended as a first-line therapy in children with pneumonia-associated empyema. Despite evidence showing similar outcomes following each type of intervention, video-assisted thoracoscopic surgery is a major surgical procedure, while CTF is a bedside procedure, which is less invasive and less costly.

Regarding tube size, the Infectious Diseases Society of America (IDSA) panel suggests the use of small-bore chest tubes over large-bore test tubes in children with parapneumonic effusion or empyema, based on the evidence of a small number of comparative studies. It is also recommended that tissue plasminogen activator be used alone, rather than in combination with dornase alfa (DNase) in children with pneumonia-associated empyema. In the discussed case, the patient underwent pleural fluid drainage by CTF, with a 12-gauge catheter draining 1.5 L of purulent fluid, and tissue plasminogen activator was instilled in pleural space via a catheter for 3 days.

CONCLUDING REMARKS

The session concluded with thought-provoking questions for the panel. While the draft guidelines outlined during the session specifically focus on the clinical management of patients with cUTI, catheter-related bloodstream infections, and community-acquired pneumonia in infants and children, the experts hope the scope of the guidelines is widened in future to include guidelines for diagnosis. ●