Table II. Empiric Antimicrobial Treatment for UTI in the ICU Patient

Woman with severe acute uncomplicated pyelonephritis[1] admitted to ICU

a) No hospitalization or UTI antimicrobial use in past 6 months

- Ciprofloxacin 400 mg IV twice daily
- Levofloxacin 500 to 750 mg IV once daily
- Ceftriaxone 1-2 g once daily

Consider adding vancomycin until r/o Gram-positive uropathogen by Gram stain or culture[2]

b) Hospitalization or UTI antimicrobial use in past 6 months

- Cefepime 1 g twice daily
- Piperacillin-tazobactam 3.375 g every 6 hours
- Meropenen 500 mg every 8 hours
- Imipenem-cilastatin 250-500 mg every 6 to 8 hours

Consider adding vancomycin until r/o Gram-positive uropathogen by Gram stain or culture[2]

Patient with severe acute complicated pyelonephritis[3] admitted to ICU

- Cefepime 1 g twice daily
- Piperacillin-tazobactam 3.375 g every 6 hours
- Meropenen 500 mg every 8 hours
- Imipenem-cilastatin 250-500 mg every 6 to 8 hours

Add vancomycin until r/o Gram-positive uropathogen by Gram stain or culture

Patient in ICU with urinary catheter who develops suspected UTI based on fever and pyuria and no other obvious source[4]

- Cefepime 1 g twice daily
- Piperacillin-tazobactam 3.375 g every 6 hours
- Meropenen 500 mg every 8 hours
- Imipenem-cilastatin 250-500 mg every 6 to 8 hours

Add vancomycin until r/o Gram positive uropathogen by Gram stain or culture

Patient in ICU with urinary catheter and candiduria who is not at high risk for dissemination[5]

- Asymptomatic:
  - Treatment not indicated
- Cystitis
  - Fluconazole 200mg once daily for 2 weeks
- Pyelonephritis
  - Fluconazole 200-400mg once daily for 2 weeks

Patient in ICU with urinary catheter who is stable, afebrile with no urinary symptoms (if history obtainable), and pyuria and bacteriuria[6]

- Treatment not indicated

[1] Healthy ambulatory non-pregnant female (avoid fluoroquinolone if pregnant).

[2] Vancomycin is usually not indicated for acute uncomplicated pyelonephritis, but it is reasonable to consider in a woman with pyelonephritis who warrants ICU admission until Gram-positive infection can be ruled out.

[3] Male or female with complicating condition (see Table 1).

[4] UTI is often not the source of fever, even if urine culture positive, so continue to look for other source; and limit duration of antimicrobial if no other source found.

[5] Patients with neutropenia, infants with low birth weight, and patients who will undergo urologic manipulations are at high risk for dissemination and should be treated more aggressively.

[6] Urinalysis and urine culture are not indicated in such a patient.

Footnotes

- Obtain urine culture in all cases prior to treatment; if catheterized for more than a week, change catheter before culture if feasible.

- Choice of agent should be based on recent culture results in the patient and, if available, local ICU antibiogram.
- Choose alternative agent if exposure to same class in past 6 months
- Use a carbapenem (meropenem or imipenem) if an ESBL strain is known or suspected based on past cultures.
- Add vancomycin if blood culture or urine gram stain or culture has Gram-positive cocci.
- Add vancomycin if perirenal or renal abscess noted on imaging study.
- Adjust doses based on renal function.
- Tailor regimen on the basis of antimicrobial susceptibility results.
- Note that not all regimens are FDA-approved for UTI.
- Recommended duration of treatment is 7-10 days in most, consider longer in patients with delayed response or severe infection (see text).