Acute Complicated UTI including Pyelonephritis

General points

- Symptoms of upper urinary tract infection include fever, rigors, flank and loin pain/tenderness, nausea and vomiting.
- Send MSU/CSU and blood cultures before staring antibiotics if possible.
- Review previous microbiology test results, in particular MSU/CSU cultures for resistance profiles of suspected Gram negative pathogens such as E. coli, Klebsiella spp. and for MDROs such as ESBL-producers or CPE - Discuss with microbiology if required.
- Assess for sepsis and follow relevant protocols if applicable.
- Obstruction of the urinary tract is the most frequent urological source of urosepsis.
- Consider urgent renal tract imaging to assess as indicated. If identified, decompression of obstruction, drainage of abscesses, and removal of foreign bodies such as urinary catheters or stones as source control strategies are crucial.

Antibiotics (Empiric therapy)

First line:

Piperacillin-tazobactam 4.5g TDS/QDS IV (QDS dosing indication: severe infection, neutropenic sepsis or Pseudomonas aeruginosa infection)

+ * **Gentamicin** once daily IV single dose. (Please see Gentamicin dosing schedule)

NOT-IgE-mediated /anaphylaxis/severe penicillin allergy :

Ceftriaxone 2g once daily IV + * **Gentamicin** once daily IV single dose. (Please see Gentamicin dosing schedule) .

IgE-mediated /anaphylaxis/ severe penicillin allergy :

Ciprofloxacin** 400mg BD IV + * **Gentamicin** once daily IV single dose. (Please see Gentamicin dosing schedule) .

If history of ESBL -producing gram negative bacteria use **Meropenem** 1g TDS IV. Restricted agent, discuss with Clinical Microbiologist.

*In severe illness, septic shock or if history of infection/colonisation with gentamicin resistant gram negative bacteria use **Amikacin** once daily single dose (max dose 1.5g) instead of gentamicin. (Please see Amikacin dosing schedule) .

** Please read the HPRA Drug Safety Alert issued in 2018 and the HPRA Drug Safety Newsletter issued in 2023 highlighting restrictions on use of fluoroquinolones (eg. ciprofloxacin, levofloxacin) due to the risk of disabling, long-lasting and potentially irreversible side effects (including tendon damage, QT prolongation, neuropathies and neuro psychiatric disorder). Use of fluoroquinolones in older patients, those with renal impairment, solid organ transplantation or on systemic corticosteroids increases the risk of tendon damage.

Comments

- Stop aminoglycoside when patient stable or if identified pathogen tests susceptible to primary antibiotic. Single dose only may be required. Treatment beyond 3 days is rarely indicated.
- Review antimicrobials at 24-48h with urine and blood culture and susceptibility test results to ensure pathogens identified are susceptible to antibiotics prescribed.
- De-escalate to narrower spectrum agent if possible.
- Consider renal tract imaging to investigate for obstruction or structural abnormality, in particular if clinical improvement is slow.
- Switch to oral agent if available when suitable.
- Nitrofurantoin is NOT suitable for the treatment of pyelonephritis or systemic infection as it does not achieve tissue and blood levels sufficient for these indications.
- **Duration:** 7-10 days is usually sufficient. Longer courses 10-14 days may be required in those with a slow clinical response and suboptimal or delayed source control, if applicable.