A Wee Problem

Dr Gavin Forbes
ST4 Medical Microbiology, Public Health Wales
Microbiology Cardiff
Mr M

- 61 year old man
- Long history of large kidney stone in single right kidney
- Multiple episodes of UTI, with multiple courses of antibiotics
- Long-term antibiotic prophylaxis, including nitrofurantoin and trimethoprim
Mr M’s surgery

- Admitted on 29th Dec for laser lithotripsy of stone with insertion of ureteric stent
- Septic post-op
  - Treated with 7 days of pip/taz and gent
- Clinically improved
  - Further 7 days of cipro, then continue prophylactic trim until further procedure on 26th Jan
Mr M comes back

- Further laser lithotripsy and change of stents on 26th Jan
- Septic post-op
  - Started on mero
- Clinically improved
Mr M’s positive blood culture

- Blood culture from 27\textsuperscript{th} Jan flagged positive on 29\textsuperscript{th}
  - GNB ?coli from aerobic bottle
- Clinically well on mero
- Small fragment of stone still in-situ
  - Surgeons felt likely to pass on it’s own
- WBC 21.4, neut 19, CRP 291
Mr M’s positive blood culture

• Isolate identified as *Pseudomonas aeruginosa* by MALDI-ToF
• Decreased zone sizes to all antibiotics on first line disc set
  – cip, ceftaz, imi, mero, pip/taz, gent
• Patient refusing to stay in hospital as clinically very well
  – Discharged on high dose cipro
Initial actions

• Isolate sent to SACU for MIC determination and resistance mechanism evaluation

• Infection Prevention and Control team informed
  – Recent admissions reviewed to determine number of patients exposed to potential multi-drug resistant organism (MDRO)
  – Patient isolated in cubicle and nursed with strict contact precautions
SACU results

• MIC results (E-test)
  – Ceftazidime >256mg/L – Resistant
  – Imipenem >32mg/L – Resistant
  – Meropenem >32mg/L – Resistant
  – Colistin 1mg/L – **Susceptible**
  – Amikacin >256mg/L – Resistant
  – Aztreonam 48mg/L – Resistant
  – Ciprofloxacin >32mg/L – Resistant
  – Doxycycline >256mg/L – No clinical breakpoint available
  – Fosfomycin 3mg/L – No clinical breakpoint available
  – Piperacillin/tazobactam 128mg/L – Resistant
  – Ticarcillin/clavulanate >256mg/L – Resistant
  – Tigecycline 48mg/L – No clinical breakpoint available
  – Tobramycin >256mg/L – Resistant
Phenotypic tests
Phenotypic tests
SACU results

- Genotypic tests
  - VIM positive by PCR
Mr M comes back

• Readmitted overnight on 15\(^{th}\) Feb
  – Septic
  – CT showed severe hydronephrosis due to obstruction by multiple renal stones
  – Started on mero and gent
  – Ureteric stent inserted as emergency to relieve obstruction
  – Admitted into cubicle with contact precautions
Mr M deteriorates

- Ongoing clinical deterioration
  - Remains septic and pyrexial on mero
  - Gentamicin stopped due to worsening acute kidney injury
- IV colistin added
- Rapid clinical improvement
Mr M gets the runs

• Develops diarrhoea on 16\textsuperscript{th} Feb
  – 5 episodes type 7 stool

• Stool sample sent 17\textsuperscript{th} Feb
  – GDH positive, CDT positive
Clinical conundrum

• Problem 1
  – Carbapenemase–producing *P. aeruginosa* bacteraemia

• Problem 2
  – *C. difficile* associated diarrhoea

• Need to balance appropriate antibiotic treatment for bacteraemia against risk of perpetuating or worsening CDAD
Antibiotic plan

• Stop meropenem
  – Broad spectrum antibiotic likely to worsen CDAD

• Continue IV colistin
  – Only antibiotic with microbiological evidence of effectiveness against *P. aeruginosa* in bloodstream

• Start oral vancomycin
  – CDAD assessed as moderate severity, but multiple other medical issues
Mr M remains in hospital

- Continues to pass stone fragments
- Clinically well on IV colistin
- Renal function improving
- Diarrhoea improving
- Remains isolated with contact precautions
Ongoing antibiotic plan

- Further procedure for lithotripsy, stone retrieval and stent change
- Remain well and apyrexial post-operatively on colistin and oral vanc
- Added oral fosfomycin for further antibiotic cover as remaining stones likely to provide ongoing source of infection
Mr M goes home

- Stents removed and no further procedures planned
- Colistin stopped after 10 days
- Oral fosfomycin to continue for one month to reduce chance of further symptomatic infection
- As of time of writing, patient has not been readmitted
Main clinical issues

- Carbapenemase producing *P. aeruginosa* likely secondary to extensive previous antibiotic exposure
  - Limited treatment options for patient presenting significantly unwell
  - Requires isolation and strict infection control practices
  - Complicated by antibiotic-related CDAD
Thanks for listening

• Questions?