Central and North West London NHS
NHS Foundation Trust

Milton Keynes Community Health Services

Antimicrobial Stewardship and CAUTI

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Wellbeing for life

Plan of talk:

- Antimicrobial Stewardship
- Management of CA-UTI
  - Diagnosis
  - Treatment
  - What if?
  - Prevention
- Guidelines
- Summary

Antimicrobial Stewardship

- ‘A marriage between infection control and antimicrobial management’ – Professor Dilip Nathwani, Chair, Scottish Antimicrobial Prescribing Group
- A series of interventions to manage antimicrobial use with the aim of maximising clinical efficacy whilst minimising associated risks such as toxicity and the development of resistance

Antimicrobial prescribing
What can go wrong?

- Mis-diagnosis / started unnecessarily
- Wrong drug – usually too broad-spectrum
- Wrong dose / frequency / route
- Wrong duration – usually too long

  Leading to

- Reduced efficacy, toxicity, interactions, resistance, acquisition of HAIs, increased costs

Antibiotic use

- Resistance
  - Creates new resistant strains
  - Selects for current resistant strains
- Healthcare Associated Infections
  - MRSA, *C diff*, ESBLs, *Candida* sp.
- The wider social impact of resistance

Stewardship in action

- Formulary Management
- Local guidelines
- Education
- Clinical Interventions:
  - Daily review of all patients on antimicrobials
  - Joint microbiology / pharmacy ward rounds
  - Restricted antimicrobial policy, restricted sensitivity reporting
  - IV to oral switch
  - De-escalation and early discharge
- Surveillance, audit & feedback to prescribers and other healthcare staff.

10 steps to better prescribing

1. **Only treat *active* infections**
2. Use local guidelines for empirical treatment
3. Send MC&S before prescribing, where appropriate
4. Review choices on the basis of known culture and sensitivities, using narrow spectrum agents where possible
5. **Record indication for and choice of antimicrobial in medical notes**
6. Adjust dose for age / renal / hepatic / immuno-compromised
7. Consider drug reactions / interactions / allergies
8. Review course length, route and need for antimicrobials daily, switch to oral, simplify or stop when appropriate
9. Consider infection control issues
10. Challenge / refer when necessary

Hospitals: Antimicrobial Management Team (AMT)/Stewardship group

- Remit: to manage effective antimicrobial use
- Work: policies, education, audit, surveillance
- Reports to: Drug and Therapeutics Committees and IPC Committee
- AMT Membership:
  - Lead clinician (chair), Antimicrobial pharmacists, Microbiologists, Infectious Diseases Consultant, Infection Control Manager, IPC nurse, Medical, Surgical, IT etc

Community? Often the work is part of the pharmacy remit, CCG/CHS or IPC team, no official England template

Introduction to UTIs

- UTI – a **symptomatic** infection of the upper or lower urinary tract,
- Asymptomatic bacteriuria is bacteria in the urine but with no symptoms
- Treatment for UTIs depends on:
  - age
  - sex of the patient
  - pregnancy status
  - upper or lower UTI
  - catheter

Asymptomatic Bacteriuria

- Will be present in all patients with long term catheters
- Increases with age
- Bacteria in the urine is not a disease:

  our own normal bacteria are an important part of the body's defence against harmful bacteria.
- Only important to be screened for in pregnant ladies

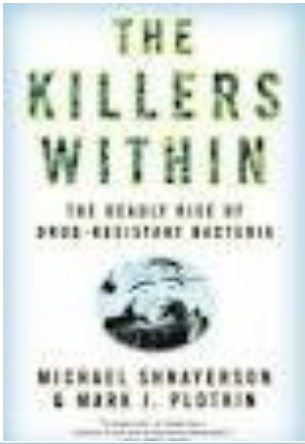
Should we treat Asymptomatic Bacteriuria?

- Research has shown that for every three older people treated for asymptomatic bacteriuria, harm is caused to one of those people.
- Adverse reactions to antibiotics include rashes, thrush and gastrointestinal problems including *C difficile*
- Increase in resistant organisms

Bacteriuria and Catheterisation

- Each day the catheter is in place the risk of acquiring bacteria in the urine rises by 3-8% - after 20 days most will have bacteriuria
- Catheterisation carries the risk of significant danger to patients from infections.
- **Those catheterised for > 75% of year**
  - **3x more likely to receive antibiotics**
  - **3x more likely to be hospitalised**
  - **3x more likely to die**

- ***Tsan et al 2008, Kunin et al 1992***



Inappropriate management of UTIs is driving resistance

- Community patient, long-term catheter
- Multiple CSUs, each generates a prescription
- Development of ESBL *in vivo*
- ESBL UTI – hospital admission
- Carbapenem prescribed, Carbapenem use increases in hospital
- Resistance to carbapenems develops
- Carbapenem resistant strains endemic in hospital

Tests for bacteriuria:

To dipstick or not to dipstick...

- Dipsticks tell you presence of:
  - Bacteria
  - White cells
  - Red cells

NOT their significance

- They may be useful for elimination of possibility of UTI.
- People are very likely to have bacteria in their urine if they are catheterised, therefore dipstick of little benefit.

Urine sampling in CAUTI

- Only sample patients symptomatic of UTI to guide antibiotic therapy
- Ideally, microbiologically, urine sample should be obtained by removing the indwelling catheter and obtaining the sample through a new catheter
  - this may not be possible, time, qualified staff etc
  - if history of trauma with catheter change, may not be desirable as may increase risk of bacteraemia
- If not possible, sample should be obtained through catheter port using aseptic technique, NEVER FROM DRAINAGE BAG
- Always mark the sample as CSU and symptomatic patient.

Symptoms of CAUTI

General symptoms of infection:

- New onset or worsening fever >37.9, or 1.5C above baseline X2 for 12 hours
- Rigors
- New onset delirium
- Nausea (with or without vomiting)
- Malaise/lethargy
- Confusion

Localising symptoms:

- Loin tenderness
- Flank or Suprapubic discomfort
- Costovertebral angle tenderness
- Acute haematuria

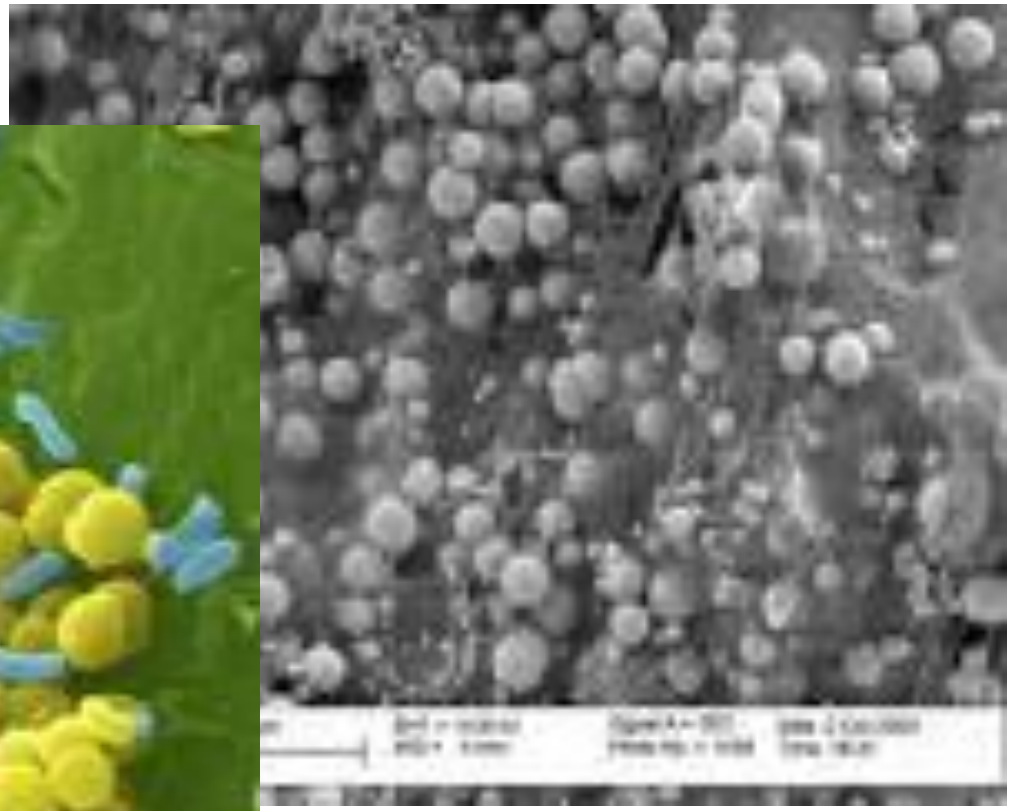
Further considerations

- Knowing the person or taking advice from someone who knows the person is crucial.
- One third patients with fever will have UTI
- Exclude other causes if localising symptoms absent
- Check continued need for catheterisation
- Check catheter isn't blocked
- Don't forget to treat the patient ie fluids, pain relief etc

Initiation of antibiotic therapy.

- For patients who no longer require catheterisation – catheter should be removed and empirical antibiotic therapy given for 3 days whilst awaiting results from MSU (taken after catheter removal).
- If long term catheterisation is still required and catheter was not changed at the time of sampling, the catheter should be replaced at the initiation of empirical antibiotic therapy (prescribed for 7 days) whilst awaiting results from MC+S
  - 89% negative urines at 3 days if changed *versus* 30% if not changed
  - Catheter replacement is associated with fewer and later relapses
  - Biofilm penetration of most antibiotics is POOR

Biofilms



Recommended empirical therapy

- Empiric therapy is started and then may be changed based on laboratory results
- Choice of empirical agents guided by local antibiotic policy, based on most likely or and adjusted for local

resistance patterns.

- Avoid broad spectrum agents
- Avoid NF if eGFR<60ml/min
- Adjust therapy if required from

MC+S sensitivities

8 Golden Rules

- Do not dipstick catheter urines in asymptomatic patients
- Do not culture catheter urines in asymptomatic patients
- Symptomatic Diagnosis is Key
- Use correct technique to obtain sample
- Change catheter before initiating antibiotic
- Prescribe empirically from local guidance whilst waiting for MC+S result
- Review MC+S result and antibiotic choice
- Do not send CSU to check for clearance of infection

What If?

- MC+S returned as sensitive to empirical antibiotic used but symptoms not cleared at 7 days?
- MC+S results show no growth?
- MC+S results show resistance to current antibiotic?
- Patients get recurrent symptomatic infection?

Prevention

Fluids

Patient Education

- Maintaining a closed drainage system
- IPC/hygiene measures
- Avoiding use of talcs/creams around urinary tract
- Washing the genital areas after intercourse
- Dietary advice to avoid constipation and bladder irritation

Antibiotic Prophylaxis

- Giving regular antibiotics to prevent infection is not usually recommended.
- Will not decrease symptomatic infections in catheterised patients.
- Will increase the risk of antibiotic resistance & adverse reactions.
- DO NOT USE when changing catheters
- Only give prophylaxis when

changing catheters in patients with previous history of UTI following catheter change

Not recommended:

- Antimicrobial bladder instillations or washouts must not be used to prevent catheter-associated infections
- Antiseptic solutions or ointments for routine meatal care

Antimicrobial Catheters

- Antimicrobial catheters- delay time to colonisation, don't prevent it, therefore theoretically of use in short term catheterisation (<1 week for antimicrobial coated and < 2 week for silver coated)
- Recent trial published in Lancet showed silver alloy-coated catheters not effective for the reduction of incidence of symptomatic CAUTI, borderline reduction in nitrofural-impregnated cathters, not clinically important and rates of discomfort higher.

Lancet 2012 Dec1;380(9857):1927-35

Guidelines

- IDSA Guidelines for Asymptomatic Bacteriuria CID 2005;40:643-54
- IDSA Guidelines for the treatment of acute uncomplicated cystitis and pyleonephritis in women CID 2011;52(5) 103-120
- Diagnosis of UTI Quick Reference Guide for Primary Care HPA (PHE) April 2011
- SIGN Management of Suspected Bacterial UTI in adults July 2012
- SAPG Decision aid for diagnosis and management of suspected urinary tract infection (UTI) in older people May 2013
- Local guidelines can be developed with continence nurses/antimicrobial pharmacists/microbiologists to reflect local antimicrobial guidelines

Summary

- **Symptoms** should be used to diagnose infection
- Only treat active infection
- Routinely testing for bacteria in urine is not necessary, unless patient is pregnant.
- Prescribing antibiotics inappropriately can cause more harm than good and increases resistance.
- Prudent use of antibiotics will minimise development of resistance and reduce side effects eg *C difficile*

Thank you, Questions?

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