Managing Acute Infections in Aged Care: A Clinician's View

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Overview

- *Clostridium difficile*
- Norovirus, gastroenteritis
- Influenza
- Colonisation with MROs
  - MRSA
  - VRE
  - ESBLs

Clostridium difficile

Case #1 – Joan

- 87 year old nursing home resident
- Past Medical History
  - Cerebrovascular accidents, ischaemic heart disease, dementia, osteoporosis
- Medications
  - Aspirin, clopidogrel, metoprolol, irbesartan, pravastatin, donepezil, alendronate

Case #1 continued

- Noted by nursing staff to have ‘funny smelling urine’
- Otherwise asymptomatic
- MSU taken
  - White blood cells 58
  - Red blood cells 21
  - *Proteus mirabilis* cultured
- Started on 5-day course of Augmentin Duo Forte

Case #1 continued

- Develops watery diarrhoea
- 5 days after antibiotics completed
- 12 times per day
- Appears in pain
  - Clutching at lower abdomen
  - Tender to examination
- Low grade fever
- Poor oral intake

Case #1 continued

- Sent to local hospital by ambulance
- Elevated WCC with ‘left shift’
- IV fluid resuscitation
- Stool sample taken
  - White blood cells ++, red blood cells +
- Put in a single room, contact precautions
- Started on norfloxacin empirically

Case #1 continued

- Initially improves with IV fluids
- Diarrhoea reduces in frequency
- Pain increases
- Higher fever
- Noted to have marked abdominal distension
- Abdominal X-ray

Picture of X-ray deleted

Case #1 continued

- Diagnosis of toxic megacolon
- Surgeon consulted
- To theatre
- Colectomy
- Ileostomy

Picture of bowel deleted

Case #1 continued

- Stool result
  - *Clostridium difficile* cultured
  - Toxin assay positive
- Given metronidazole (plus ampicillin & ceftriaxone)
- Slow recovery post operatively
- Sent to rehab one month later
- Develops nosocomial pneumonia
- Deceased 3 days later

Case #1 continued

- Three other residents at NH develop diarrhoea
  - Stool tests positive
- Treated with 14 days of metronidazole
- Four other asymptomatic residents positive on stool testing
  - Not treated

Issues related to Joan's case

- *C. difficile* infection
  - Causes
  - Symptoms
  - Treatment
  - Prevention
  - Virulent strains overseas
- Asymptomatic bacteriuria therapy

C. difficile infection

- Gram-positive bacillus
- Spore forming
  - Resistant to heat, alcohol, acid and antibiotics
  - Soap & water better than hand rubs?
- Frequently seen as ‘normal bowel flora’
  - i.e. culture positive, toxin negative
- Some strains produce toxin
  - Require toxin for causing illness

C. difficile infection

- Faecal-oral spread
- Diarrhoea usually antibiotic associated
  - During antibiotics
  - 5 – 10 days later
- Other risk factors
  - Advanced age
  - Co-morbidities
  - Gastric acid suppression
  - Enteral feeding
  - Gastrointestinal surgery
  - Cancer chemotherapy

C. difficile infection

- Spectrum of illness
  - Asymptomatic carriers
  - Watery diarrhoea due to colitis
  - Pseudomembranous colitis
  - Fulminant colitis
    - Toxic megacolon

Picture deleted

C. difficile treatment

- Metronidazole
  - Preferably orally
  - 10 – **14** days
- Oral vancomycin
  - Concerns re induction of VRE
- Bacitracin
- Fusidic acid
- Fecal enema…

C. difficile prevention

- Contact precautions for cases
- Hand hygiene
  - Alcohol based hand rubs
  - Soap & water
- Environmental cleaning
  - Hypochlorite
- Antibiotic restriction

Further issue

- Asymptomatic bacteriuria
  - Very common -≥50%
- No benefit in treatment
  - Does not prevent 'infection'
  - Does not improve urinary function
  - Does not improve survival
- Potential harm from unnecessary antibiotics
  - Cost
  - Resistance
  - Side effects

Gastroenteritis

Norovirus

Case #2 – Bill

- 90 year old hostel resident
- Past medical history
  - Ischaemic heart disease, aortic valve replacement, CABGS, cardiac failure, renal impairment
- Medications
  - Warfarin, carvedilol, fosinopril, frusemide, spironolactone, Epo
  - Strict fluid restriction 1.5 l per day

Case #2

- At dinner
- Starts vomiting
- Watery diarrhoea
- Myalgias, headache, malaise
- Febrile to 38.4°C
- Miserable

Case #2

- By day 3
  - Still vomiting 6 – 10 x per day
  - Diarrhoea 6 x per day
- Requests extra frusemide as urine output falling off
- Locum called
- Creatinine up to 450 mmol/l (baseline 180)
- Potassium 6.4 mmol/l
- Admitted for IV fluid resuscitation and resonium
- 7 day admission

Other residents

- 3 other residents develop gastro at the same time
- 8 more that were at or near Bill's dinner table also get it 1 – 2 days later

Gastroenteritis in residential care

- Mostly viral
  - Noroviruses
- A major problem due to ease of spread
  - In hospitals
  - In residential care
- Also easily spread to staff members

Illness

- Incubation 1 – 3 days
- Vomiting usually > diarrhoea
- Low grade fever
- Aches & pains

How is it spread?

- Fecal-oral contact
  - Shared toilets or sinks
- Can become aerosolised

- Shedding definitely for 2 – 3 days
- Possibly longer?

Treatment

- Fluid replacement
  - Important in those on fluid restriction
- Monitor adequacy with urine output where possible
  - Withhold diuretics +/- anti-hypertensives?
  - Are mucous membranes dry?
  - Feeling thirsty?
- Anti-emetics
- Anti-diarrhoeals

Prevention

- Food handlers
  - Education & monitoring
  - Safe food preparation
  - Raw meats, eggs
  - Staff hand hygiene, universal precautions
  - Gloves
- Isolation of cases
  - Or cohorting

- Staff must not work when they have gastro

When is admission required?

- Patient factors
- Unable to keep up with fluid losses
- Significant volume depletion
  - Poor urine output
  - Falling blood pressure
  - Loss of weight

Influenza

Case #3 – Betty

- 88 year old
- Resident in nursing home
- Past medical history
    - Dementia, multiple strokes, cardiac failure, renal impairment, cholecystectomy
- Medications
    - Aspirin/persantin, frusemide, potassium, irbesartan, bisoprolol, simvastatin

Case #3

- Visited by grandson's family including her great-grandchildren
- Toddler has fevers and runny nose
- Two days later, Betty becomes unwell
- High fever
- Aches and pains
- Sore throat
- Dry cough

Case #3

- Fever persists for several days
- Increasing dyspnoea
- Cyanosis
- To hospital
- “Pneumonia”
- Initial IV antibiotics
- Comfort measures
- Deceased

Back at the nursing home

- Seven new cases of respiratory tract infections
- Four mild
- Three hospitalised
  - Diagnosis of influenza A in two
- Five staff members require time off
  - None had received ‘flu vaccine this year

Influenza in the elderly

- Incubation period 1 – 2 days
- Abrupt onset of symptoms
- Spectrum of symptoms
  - Like a cold
  - Uncomplicated influenza
  - Complications

Complications

- Pneumonia
  - Primary influenza pneumonia
  - Secondary bacterial pneumonia
- Myositis or rhabdomyolysis
- CNS
  - Encephalitis
  - Meningitis
  - Transverse myelitis
- Myocarditis or pericarditis, AMI, worsening of CCF

Spread

- Inhalation of small particle aerosols
- Contact with droplets
- Virus shedding prior to symptoms
- High viral shedding in first 24 – 48 hours
- Decreases thereafter
- Usually stops by 5 – 10 days
- Potentially longer in children & the elderly

Diagnosis

- Viral PCR
  - Nose & throat swab
  - Cost
- Rapid point of care tests
  - Cost

- (Serology)

Treatment

- Symptomatic
  - Paracetamol (for discomfort)
  - NSAIDs like ibuprofen
- Maintain fluids
- Antiviral agents
  - Oseltamivir
  - Zanamivir

Drug therapy

- Shorten duration of symptoms
- Average 1 – 2 days less
- Better if started within 12 hours
- No use after 72 hours

- Prophylactic use
- Availability
- Resistance

When is admission required?

- Patient factors
- Complicated cases
  - High respiratory rate, cyanosis
  - Altered conscious state

Prevention

- Vaccination
  - Over 65 years
  - Those that care for the over 65 year olds
  - Staff!!!
  - Children
  - Also prevents pneumonia in the elderly
- Hand hygiene
- Isolation (or co-horting)

- Prophylactic antivirals

Side effects of vaccination

- Sore arm
- Low grade fever for 8 – 24 hours
- Mild 'flu-like aches for up to 24 hours

- Cannot cause true influenza
- Waiting room exposure

MROs

MRSA, VRE, ESBLs

Common myths 1

- They are untreatable
- They are only caught in hospitals
- Once acquired, you’re a goner
- I’m healthy so I couldn’t be carrying them
- VRE causes diarrhoea

Common myths 2

- They're caught through the air
- They are more virulent than non-multi-resistant pathogens
- They're going to get us all
- Eradication is impossible
- Staff members can take them home and this will put their kids in danger

How common are they?

- Depends where & how hard you look
- MRSA
  - ~30% of hospital-acquired *Staph aureus* infections
- Community-acquired MRSA
- VRE colonisation:infection
  - Hospital vs. aged care facilities
- VRE risk groups
- ESBLs
  - Hospital *vs*. Community

What problems can they cause?

- MRSA
  - Skin infections in those with wounds
  - Diabetic foot infections
  - Rare pneumonias
  - Urinary tract infections
  - Invasive infections

What problems can they cause?

- VRE
  - Less pathogenic
  - Harder to kill
  - “Opportunistic” pathogen
  - Invasive infections

  - Environmental shedding

What problems can they cause?

- ESBLs
  - Urinary tract infections
  - Invasive infections
- Much harder to treat
  - IV only option for most

What about for visitors & staff members?

- Low risk
  - Unless open wounds etc
- Hand hygiene
  - Before & after contact with the resident
  - Soap & water – 1 – 2 minutes
  - Alcohol based hand rub –≤15 sec

Preventing spread

- Standard precautions
- Hand hygiene most important
  - Before & after contact
  - Thus alcohol based hand rubs most efficient
- Cleaning shared equipment
  - Prowipes
- The VRE patient that has diarrhoea or fecal incontinence

Eradication?

- MRSA
  - Mupirocin & chlorhexidine
- VRE
  - Avoid unnecessary antibiotics
- ESBL
  - Hand hygiene
  - Avoid unnecessary antibiotics