What Are Extended Beta Lactamase Producing Organisms?

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- Increasing in New Zealand - particularly the Auckland and Hawkes Bay areas.
- Occurs predominantly in hospitals and long term care facilities.
- 1996 - 2000 = 35 cases confirmed annually
- 2001 = 83 confirmed
- 2004 = 389.
- Majority of isolates have been E. coli from urinary sites.

- Group 1:
  - Seriously ill patients with prolonged duration of hospital stay, in whom invasive medical devices are present. Acquire ESBL producers 10 -70 days after admission.
- Group 2:
  - Elderly patients, frequently long term care facility residents, with ESBL producers in urine.

- ESBL stands for extended spectrum beta lactamase
- Several different types but most commonly produced by two bacteria:
  - E coli
  - Klebsiella

- produce enzymes that break down some antibiotics

- have developed a resistance to penicillin

- May colonise the gastrointestinal tract
- It is an ‘opportunistic’ organism
- can be completely harmless
- cause infection in the immunocompromised.

- Can be found in the faeces of farm animals possible contamination of food.
- Spread from person to person
- Spread easier if normal gut flora destroyed by use of antibiotics
- Cause urinary tract infections

- Environmental common source or patient contaminated environment?
  - Patients’ soap
  - Sink basins
  - Babies’ baths

- Hand isolates have been identified which are genotypically identical to isolates causing infections

- Hand carriage disappears with directly observed hand hygiene.

- Prolonged hand carriage in health care staff with chronic dermatitis.

- Usually over 65 years and female
- Affects those with underlying medical conditions
- very sick or very old
- Have taken antibiotics previously
- Have been hospitalised.

- GI Colonisation:
  - Ratio of colonisation to clinically significant infection is at least 2:1
  - In some outbreaks, 30 -70% of all ICU patients have become colonised
  - At least 80% of patients with infection have documented prior GI colonisation

- Spread directly by person-to-person contact
- indirectly from contaminated objects
- faecal-oral route
- poor practice in urinary catheter care

Infection Control Scenarios:

- New occurrence in units not previously endemic.
- Hospital units where ESBLs have established their presence.
- Long Term Care Facilities

- Acute-care hospitalised patients will be isolated.

- Not necessary in Long Term Care Facilities.

- Treatment should be on clinical need and antibiotic susceptibility.

- Eradication should NOT be attempted.

- Strict isolation of residents colonised/infected NOT recommended.
- Strict adherence to Standard Precautions
  - Hand hygiene. Place alcohol based in resident’s room.
  - water-proof aprons used for individual resident
  - if communal showers - shower last where possible. After shower is cleaned, wipe down with a 1:10 bleach solution and leave to dry.
  - single room where possible. If not possible, share with resident who has no wounds and no catheter

- If possible clean room last following which mops and dusters go to laundry
- After damp dusting of all horizontal surfaces and mobility aids - re damp dust using a 1:10 bleach solution. Leave this to air dry.
- Dishes managed routinely
- Laundry managed routinely.

- Transfers between hospitals should be handled routinely.

- Information regarding status should be given to receiving hospital.

- No justification for exclusion from any health care facility

Steps in Prevention:

- Perform rectal swabs to delineate the pool of patients who are colonised.
- Evaluate for a common environmental source
- Campaign to improve hand hygiene compliance
- Enforce CONTACT ISOLATION for patient found to be colonised or infected.

Long Term Care Facilities and ESB Producers:

- Up to 40% of residents have taken antibiotics in the last month
- Infection Control suboptimal
- Urinary catheterisation and decubitus ulcers are frequent

A 1999 Point-prevalence study in a Chicago Nursing Home = 46% of colonised residents

Risk Factors:

- Presence of decubitus ulcer
- Presence of a gastrotomy tube
- Poor functional status
- Prior receipt of ciprofloxacin
- Prior receipt of trimethhoprim-sulfamethoxazloe

- Long Term Care Facilities are reservoirs for acute care hospitals

- Patients with hospital-acquired colonisation or infection may return to their long term care facility

General principles to interrupt outbreaks:

- Identify colonised patients
- Contact isolation
- Reduction in unnecessary antibiotic use – especially cephalosporins
- ?? Gut decolonisation.

Other measures for consideration:

- Critical evaluation of nursing work practices which could lead to infection control breakdowns.

- Attention to visiting health care professionals

- Formal notification of facilities to which patients are transferred.

- References:
  - Communicable Disease Control. Manitoba Health. August 2002.
  - Fact Sheet on ESBLs. Haringey (NHS) Teaching Primary Care Trust.
  - Draft Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Healthcare Infection Control Practices Advisory Committee.
  - Draft Guidelines for the Control of Multidrug-resistant organisms in New Zealand.
  - Patterson David. University of Pittsburgh, Medical Centre