

Multi-Resistant Gram Negative Rods

ESBL (Extended Spectrum Beta Lactamase)

What Are They?

ESBLs are multi resistant bacteria that can be present in the gut of patients or staff and usually without anyone being aware of this, therefore the application of Standard Infection Control Precautions at all times is essential to help prevent their spread.

As with all multiply resistant organisms, hand decontamination before and after every patient contact is the most important step in preventing transmission. The risk of transmission is increased if the patient has diarrhoea, wound or a urinary catheter in situ. Thoroughly cover any colonised or infected wounds or ulcers

Definitions

ESBL: Extended Spectrum Beta-Lactamase.

They are multi-resistant gram negative bacterial rods

Background

ESBLs are enzymes produced by some strains of gram negative bacteria such as *E. coli*, *Klebsiella*, *Pseudomonas aeruginosa*, *Actinetobacter baumannii* and *Stenotrophomonas maltophilia*. They have extensive resistance to common antibiotics by inactivating them and were first reported in 1983. These bacteria **predominantly originate in the bowel**.

ESBLs have the ability to destroy a wide range of Beta-Lactam antibiotics including common agents such as co-amoxiclav (augmentin), amoxicillin, trimethoprim and cephalosporins.

ESBL bacteria often also carry resistance to other classes of antibiotics such as quinolones

(e.g. ciprofloxacin) and aminoglycosides (eg. gentamicin and tobramycin)

How Are They Spread?

- ESBL producing organisms **usually colonise the bowel** without causing signs of infection
- They are capable of causing infections either locally (e.g. wounds, UTI) or systemically (bacteraemia / septicaemia)
- **They are spread by the faecal oral route and by contact via the hands of health care workers or contaminated items or equipment**

Infections with ESBL

Infections caused by ESBL producing gram negative bacteria are similar to those caused by antibiotic susceptible *E. coli*. They include urinary tract infections, wound infections, abdominal infections and blood stream infections (bacteraemia). ESBLs are not usually more virulent than sensitive strains. Treatment of ESBL infection should be directed by clinical need and antibiotic susceptibility. Advice may be sought from a Clinical Microbiologist when infections are present.

Eradication of bowel colonisation should not be attempted

Infection Prevention and Control Measures

Precautions as for multi drug resistant organisms (MDRO).

All people - healthcare workers, residents, patients and the public could be carrying an MDRO quite harmlessly to themselves as part of their normal flora.

So, most important to think of any and every person as a potential carrier of an MDRO.

Hand Hygiene Decontaminate hands (with soap and water or an alcohol based hand rub) before and after every patient contact and between dirty and clean tasks on the same patient

Gloves and Aprons Use gloves & aprons for all contact with patients and when dealing with body fluids. Perform hand hygiene after removal of gloves and aprons

Isolation Care for patients in a single room if possible. Only occasional strains spread rapidly causing outbreak infections in other people. When this occurs more rigorous infection control measures are required. Otherwise, with time, colonisation with ESBL disappears of its own accord 9 times out of 10 within one month to a year, especially if no antibiotics are being used

Cleaning Special attention, as always, should be given to cleaning equipment and surfaces contaminated with faeces e.g. commodes, toilet seats, taps, door handles and wherever hands touch

- Do not share patient care equipment if possible, where this is essential ensure decontamination between patients

- Clean and disinfect equipment immediately following patient use

GP/Community

If the strain is not just colonising, but causing an outbreak of infections in other people, or if it is resistant to all antibiotics, much more rigorous isolation precautions are required. **This is uncommon though.**

Document ESBL status in the patient's notes and in any GP discharge/transfer letter.

Notify any hospital or rest home prior to any patient transfer, as for all known MDRO's

Friends and Family

Family and household contacts do not generally need to take any extra precautions. The person colonised with ESBL should be reminded of the importance of good hand hygiene post toileting. If they have a wound, urinary infection or bag collection device – extra care should be taken to contain and dispose of waste appropriately without contaminating the surrounding environment, then thorough hand hygiene.

Restriction of activities or visitors at home is not necessary

Rest Homes/Longterm Care Facilities

If practicable discuss with the resident who has a known ESBL the need for especially good hand hygiene post toileting. Ideally have resident in a single room with their own toilet/bathroom.

Patient Transfer / Discharge Information regarding ESBL status should be documented on the patient transfer form and communicated to any hospital or rest home prior to transfer.

Inform the Infection prevention and control team prior to transfer.

No special precautions are needed for ambulance transport. Ambulance crew should use normal procedures for handling any waste and perform hand hygiene between patients.

Full environmental clean required of the bed space following any resident discharge

Risk Factors for ESBL

- Increased length of hospital or LTCF stay
- Stay in ICU / mechanical ventilation
- Frequent / long term antibiotic therapy, including extended spectrum cephalosporin use
- Post time in a facility, area or country known to have high rates of ESBL
- Placement of CVC or urinary catheters
- Immunocompromised
- Post transplant
- Premature babies
- Surgical procedures

IMPORTANT!

When any MDRO including ESBL's are colonising a person, that person can be made to feel unnecessarily frightened because they are being treated specially and with special precautions.

It is very important that they should not be made to feel an unclean pariah, because they are not. Sensible precautions slow the spread of these resistant organisms down but there are areas of the country and world that commonly have MDRO's in much larger numbers as part of the normal colonising bacteria of that community. When an infection does occur in people with an MDRO they may need a more expensive antibiotic to treat their infection, if antibiotics are required, otherwise they can lead a completely normal life.

With time and no antibiotic use MDRO's including ESBL's will usually go of their own accord, 90% of the time within one month to a year.

When we know of someone carrying an MDRO, there are highly likely to be many other unknown transient carriers of this organism also, both in that setting and in the community, including healthcare workers (HCW's). HCW's would often be expected to be colonised with an MDRO several times over a 10 year period and not realise it. Standard Precautions for all, not just isolate the few known positives is the safest most effective policy.

Remember, every use of antibiotics helps create more MDRO's by selection, and every non use in a potential use situation helps decrease this selective resistance pressure. Once resistance has been created, excellent hand hygiene, cough etiquette and environmental cleanliness etc can slow down but realistically not stop their spread.

Always promote and use good hand hygiene – any one of us may be carrying ESBL or MRSA or other MDRO and not realise it!

