Extended Spectrum Beta-Lactamase (ESBL)

Site Applicability

PHC Acute Care Sites

Practice Level

Basic: Physicians, NPs, Nursing, Clinical Nurse Leader, Clinical Site Coordinator, Bed Placement Coordinator

Standards

Routine Practices will be used for all patients who are found to have an ESBL producing bacteria.

Contact Precautions may be initiated for patients who have an ESBL producing bacteria following discussion with the Infection Prevention and Control (IPAC) team on a case-by-case basis and when there is evidence for transmission of the ESBL organism on the patient care wards.

Admitted patients who are known to be ESBL positive do not need a "Disease Alert" added in the banner bar of the patient's Cerner chart.

Admission screening for ESBL is not routinely required at PHC facilities.

Description of the Disease

Extended Spectrum Beta-Lactamase (ESBL) is an enzyme produced by some Gram-Negative Bacteria (GNB) that breaks down beta-lactam antibiotics (i.e., penicillin, cephalosporins), including broad-spectrum antibiotics such as cefotaxime and ceftriaxone. GNB most commonly associated with ESBL production are *Escherichia coli* and *Klebsiella pneumoniae*.

ESBL producing GNB are usually no more virulent or infective than other GNB, but their resistance to a wide range of antibiotics means that they may not respond to commonly used first-line antibiotics. Hospital outbreaks of infections caused by ESBL producing bacteria have been reported.

Signs & Symptoms

Positive ESBL cultures may indicate either:

- Colonization: this occurs when the organism is recovered from a patient in the absence of clinical signs and/or symptoms or immune response. Common areas for colonization are the gastrointestinal tract and the female genital tract.
- Infection: this occurs when the organism enters a body site, multiplies in tissue and causes the clinical manifestations of disease, e.g., fever, draining wound or immune response.

Incubation Period

Variable.

Period of Communicability

Variable, as ESBL bacteria may be transmitted whether the patient is colonized or infected.

Routes of Transmission

ESBL bacteria can spread from one person to another through direct contact or through indirect contact with contaminated surfaces, equipment, and via contaminated hands.

Populations at Risk

Risk factors for ESBL infection for patients include previous antibiotic use, invasive medical devices, prolonged length of stay, frail health, and admission to an intensive care unit.

Assessment and Intervention

Infection Control Precautions

- **Additional Precautions:** Generally, no Additional Precautions are required above Routine Practices.

  Contact Precautions may be implemented for patients with ESBL based off discussion with IPAC when taking into account certain patient characteristics that could increase the risk of transmission (e.g., infected wounds with uncontained drainage) or if there is evidence of transmission on a patient care unit. In these cases, the most responsible nurse will ensure Contact Precautions are ordered in Cerner and post the appropriate sign on the door (i.e., Contact).
- **Hand Hygiene:** Hands should be cleaned before and after every patient contact, as well as after touching potentially contaminated items in the environment (i.e. commodes). Using an alcohol based hand rub solution is preferred if hands are not visibly soiled. Encourage and assist the patient to perform hand hygiene.
- **Patient Placement:** Generally, patients with ESBL may be placed in any available bed/room and can share a room with other patients. If Contact Precautions are indicated due to an increased risk of transmission, a single room with a dedicated toilet and patient sink is preferred.

- **Equipment:** Clean and disinfect shared patient equipment routinely and between different patients. Clean commodes regularly and wipe touchable surfaces (armrest, seat and back) with disinfectant wipes between patients.
- **Environment:** All high-touch surfaces in the patient's room must be cleaned and disinfected at least daily. Following discharge of the patient, the room should have a terminal clean carried out prior to the next patient being admitted.
- **Visitors:** Education should be provided regarding hand hygiene, and visitors must perform hand hygiene before entry and on leaving the room.
- **Patient Transport:** When the patient is required to leave the room for diagnostic or rehabilitative purposes:
    - Notify receiving department prior to transport if precautions are in place.
    - Encourage and/or assist patient to clean their hands.
    - Cover open wounds and/or lesions with a clean dressing as per Routine Practices, efforts will be made to contain body substances with leak proof garments.

Lab Testing

- ESBL producing bacteria may be identified from cultures of stool, urine, blood, skin wounds, and respiratory specimens.
- Lab will send a notification to the unit when a specimen results positive for ESBL.

Treatment

- Generally, colonization with an ESBL producing bacteria is not treated, as it does not cause illness.
- Infections with ESBL producing bacteria are treated with antibiotics to which the bacteria are susceptible.
- Usual wound care protocols will be followed. Intact skin around a wound or insertion site may be cleansed with an antimicrobial agent (e.g., aqueous chlorhexidine, Hibidil, Baxedin).

Transfer/Discharge Planning

- Notify the receiving facility, hospital, nursing home or community agency involved in the patient's care of their status.

Outbreak Management

- Direction will be provided to the unit/hospital staff, should the Infection Control Practitioner/Physician determine there is an outbreak of ESBL.

Documentation

- Ensure order for Contact Precautions is in patient's Cerner chart only if indicated.

Related Documents

- B-00-07-13029 - Contact Precautions - Infection Control
- B-00-07-13045 - Routine Practices - Infection Control

References

Centers for Disease Control. (2022). 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Retrieved from https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf

Provincial Infection Control Network. (2013). Antibiotic Resistant Organisms Prevention and Control Guidelines for Healthcare Facilities. Retrieved from https://www.picnet.ca/wp-content/uploads/PICNet_ARO_Guidelines_March2013.pdf

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Public Health Agency of Canada. (2017). Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care. Retrieved from https://www.canada.ca/en/public-health/services/publications/diseases-conditions/routine-practices-precautions-healthcare-associated-infections.html

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