Invasive Group A Streptococcal Disease

Including Streptococcal Toxic Shock Syndrome and Necrotizing Fasciitis

Site Applicability

All PHC Acute and Long Term Care Sites.

Practice Level

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

Standards

In addition to Routine Practices, Droplet and Contact Precautions will be initiated for patients with known or suspected invasive group A Streptococcal disease until 24 hours of effective antibiotic therapy is complete.

Contact Precautions should be maintained if wound drainage cannot be contained by dressings, regardless of duration of antibiotic therapy.

Description of the Disease

Streptococcus pyogenes, also referred to as group A *Streptococcus* (GAS), are gram positive bacteria found as normal flora of the human throat and skin. The most severe infections including Streptococcal Toxic Shock Syndrome (STSS) and Necrotizing Fasciitis (NF) carry high mortality rates. There are currently no vaccines available to prevent GAS infections, although research into this area is ongoing.

Infections with GAS may be categorized as follows:

- Local - infections most commonly associated with GAS are “strep” throat, impetigo and cellulitis.
- Invasive - infections that occur when GAS enter normally sterile sites (e.g., blood, CSF, pleural fluid, pericardial fluid, bone, joint fluid, or deep tissue specimen). Invasive infections may result in severe disease or even death directly attributable to GAS.
- Severe - invasive GAS (iGAS) infections that result in STSS, soft-tissue necrosis (including NF, myositis or gangrene), meningitis, GAS pneumonia, or death directly attributable to GAS infection.

Signs & Symptoms

Streptococcal Toxic Shock Syndrome (STSS) is characterized by hypotension (systolic blood pressure 90 mmHg or less in adults or less than 5th percentile for age in children) and at least two of the following signs:

- Renal impairment: creatinine level 177 umol/L or more for adults
- Coagulopathy: platelet count 100,000/mm^3 or less, or disseminated intravascular coagulation
- Liver function abnormality: aspartate aminotransferase (AST), serum glutamate pyruvate transaminase (SGPT), alanine aminotransferase (ALT) or total bilirubin 2 or more times upper limit of normal
- Adult respiratory distress syndrome (ARDS)
- Generalized erythematous macular rash that may desquamate (i.e., skin that is scaly and may peel off)

Necrotizing Fasciitis (NF) may or may not be associated with STSS. NF is characterized by isolation of GAS from a normally sterile body site or taken under sterile conditions from deep tissue (aspirate or deep tissue exploratory) and at least one of the following:

- Histopathologic diagnosis: necrosis of superficial fascia and polymorphonuclear infiltrate and edema of reticular dermis, subcutaneous fat and/or superficial fascia (this should be distinguished from necrosis that occurs within an abscess);

  OR

- Clinical diagnosis: gross fascial edema and necrosis found at surgery or frank necrosis on physical examination.

Incubation Period

The incubation period for non-invasive GAS infection (e.g., strep throat) can be between 1-5 days. The incubation period for invasive GAS infection has not be determined; not everyone colonized with GAS will progress to an invasive infection.

Period of Communicability

Variable; if untreated, patients with streptococcal pharyngitis are infectious during the acute phase of the illness, usually 7-10 days, and for one week afterwards. However, with effective antibiotic therapy, the communicable period is reduced to 24 hours.

Routes of Transmission

Most commonly, GAS is transmitted via oral or nasal mucous membrane exposure with infectious respiratory droplets/secretions (e.g., a coughing patient with GAS in the respiratory tract) or drainage from infected wounds or skin lesions. Less commonly, transmission can occur through direct or indirect contact of non-intact skin with infectious respiratory secretions or drainage from infected wounds or skin lesions.

Populations at Risk

Individuals with chronic medical conditions, who are immunocompromised, who use injection drugs, or who are elderly may be at increased risk of iGAS infections.

Assessment and Intervention

Infection Control Precautions

- **Additional Precautions:** In addition to Routine Practices, Droplet and Contact Precautions will be initiated for patients with known or suspected iGAS disease until 24 hours of effective antibiotic therapy is complete, after which point Droplet and Contact Precautions can be discontinued. Contact Precautions should be maintained if wound drainage cannot be contained by dressings, regardless of duration of antibiotic therapy.

  The most responsible nurse will ensure Droplet and Contact Precautions are ordered in Cerner and post the appropriate sign on the door (i.e., Droplet and Contact).

- **Hand Hygiene:** Hands should be cleaned before and after every patient contact, as well as after touching potentially contaminated items in the environment. 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:** Preferred accommodation in acute care for patients with iGAS is a single room with a dedicated toilet and patient sink. The door may remain open. If patients with iGAS must be placed in shared rooms, ensure a two metre separation is maintained between patients and privacy curtains are drawn around the bed. After 24 hours of effective antibiotic therapy is complete and as long as Contact Precautions are not being maintained for uncontained wound drainage, patients can be placed in any available bed.

- **Equipment:** Dedicate equipment whenever possible. 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. Assist visitors to wear PPE, but gown and gloves are not required unless the visitor is providing direct care.

- **Patient Transport:** When the patient is required to leave the room for diagnostic or rehabilitative purposes:
  - Notify receiving department prior to transport of the precautions in place.
  - Encourage and/or assist patient to clean their hands.
  - If the patient's condition allows for it, assist the patient to wear a medical mask.
  - 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.

- **Management of Close Contacts:** For patients with severe iGAS, close contacts who had potential exposure to the patient during the seven days prior to the patient's onset of symptoms to 24 hours after initiation of antibiotics may be offered antibiotic prophylaxis. Antibiotic prophylaxis is not routinely recommended for contacts of non-severe iGAS.

  Close contacts include:

- Household contacts who have spent at least 4 hours/day on average in the previous 7 days or 20 hours/week with the case
- Non-household persons who share the same bed with the case or had sexual relations with the case
- Persons (including healthcare workers) who have had direct mucous membrane contact with the oral or nasal secretions of the case (e.g., mouth-to-mouth resuscitation, open mouth kissing) or unprotected direct contact with an open skin lesion of the case
- Individuals who shared needles for drug use

IPAC will report all cases of severe iGAS to the Workplace Health Call Centre (WHCC). VCH Public Health will identify close contacts in the community and arrange prophylaxis, WHCC identifies staff who require prophylaxis, and IPAC will identify patient contacts needing follow up.

Lab Testing

- GAS bacteria are detected through culture and deemed invasive when from a normally sterile site such as blood, CSF, pleural fluid, pericardial fluid, bone, joint fluid, or a deep tissue specimen. Sterile site specimens will be collected by a physician, with the exception of blood cultures that can be collected by lab staff/nurses when in scope of practice.

Treatment

- Appropriate antibiotic therapy will be ordered and managed by the most responsible physician (consult the Infectious Disease service as necessary).
- Additional therapies such as critical care or surgical intervention may be indicated for severe infections.
- Usual wound care protocols will be followed. Intact skin around a wound or insertion site may be cleansed with an antimicrobial agent (i.e. 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.

Documentation

- Ensure order for Droplet and Contact Precautions is in patient's Cerner chart, and discontinue order once 24 hours of effective antibiotic therapy is complete.
- Ensure order for Contact Precautions is in patient's Cerner chart if wound drainage cannot be contained by dressings.
- Chart all wound care and assessments of wound size, condition, drainage, and dressings.

Patient and Family Education

HealthLinkBC Files:

- Group A Streptococcal Infections
- Necrotizing Fasciitis (Flesh-Eating Disease)
- Toxic Shock Syndrome

Related Documents

- B-00-07-13029 - Contact Precautions - Infection Control
- B-00-07-13079 - Droplet and Contact Precautions - Infection Control

References

BC Centre for Disease Control. (2017). Communicable Disease Control: Invasive Group A Streptococcal Disease. Retrieved from http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%201%20-%20CDC/iGAS.pdf

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Definitions

"Cellulitis" is a skin infection that causes redness, swelling, and pain at the affected area of the skin.

"Direct care" includes providing hands-on care, such as bathing, washing, turning the patient, changing clothing, continence care, dressing changes, care of open wounds/lesions or toileting. Feeding and pushing a wheelchair are not classified as direct care.

"Impetigo" is a bacterial skin infection more common in infants and young children that can lead to red sores often on the face around the nose and mouth and on arms and legs that may break open and develop honey-coloured crusts.

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