Capital Health
Infection Prevention and Control

Solid Organ Transplantation

Infection Prevention And Control

Transplant Atlantic 2011

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Introduction

- In the past several years, the drugs that we use, the surgeries themselves, and infection control measures have improved outcomes for the solid organ transplant patient.

- Despite these advancements, infections continue to have a substantial influence on patient outcome

- Many factors that influence infection risk are outside the scope of this presentation, which will focus on:

  fundamental infection control practices in relation to the adult solid organ transplant patient while in hospital

APIC Text of Infection Control and Epidemiology: 3rd Edition: 2009

Outline Of Presentation

- The Solid Organ Transplant Patient (overview)
- Hand Hygiene
- Admission Screening
- Routine Practices
- Transmission Based Precautions
- The Environment
- Role of Infection Prevention and Control
- Case Study: C diff Activity On A Transplant Floor
- Questions

The Solid Organ Transplant (SOT) Patient

- Is at risk for nosocomial, opportunistic, and community-associated infection

- Type of transplant can be predictor of certain infections
- Renal transplant: UTI
- Liver transplant: abdominal infection
- Heart and Lung: Pneumonia

- **1-30 days post transplant:**

  - Bacterial infections (device and procedure related)
  - Hospital Associated Infections (HAI)
  - Guidelines for best practice guide clinical practice

  - APIC Text of Infection Control and Epidemiology: 3rd Edition: 2009

1-6 Months Post Transplant

- Related to degree and type of immunosuppression:
  - Are usually opportunistic
  - CMV is the most common
  - Others like *Mycobacterium Tuberculosis,* may reactivate

> 6 Months Post Transplant

- Community acquired
  - Community acquired infections most common
  - Varicella –zoster virus may reactivate as herpes zoster
  - Pts with recurrent or chronic rejection, poorly functioning grafts, or certain immunosuppression regimes are prone to opportunistic infections

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The Solid Organ Transplant (SOT) Patient

- **The following may increase the risk of infection**:
  - Colonization of the respiratory tract with resistant bacteria or fungus (Pseudomonas)
  - Colonization of antibiotic resistant organisms associated with long hospital stay (MRSA, VRE)
  - Poor health prior to transplant
  - Invasive procedures (surgery, devices)
  - Degree of immunosuppression
  - APIC Text of Infection Control and Epidemiology: 3rd Edition: 2009

Improving Infection Prevention Outcomes

- **Hand Hygiene**

- remains the most effective way to decrease the transmission of infections

Ten Most Common Ways Infections Are Spread

Improving Infection Prevention Outcomes

- **Admission Screening:**
  - SOT patients often come from other institutions
  - Point of care opportunity to identify infection risk and initiate appropriate precautions
  - ARO screening tool
  - ILI screening

Improving Infection Prevention Outcomes

- **Routine Practices**
  - Gloves for contaminated surfaces
  - PPE for prevention of exposure

Improving Infection Prevention Outcomes

- **Transmission Based Precautions**:

  Contact Precautions:

to prevent the spread of clinically significant pathogens

shingles

ESBL

May be used with other precautions (such as droplet)

Droplet Precautions

Improving Infection Prevention Outcomes

- **Droplet Precautions**
  - Exposure zone is 6.6 feet
  - Surgical mask/ face protection
  - Contact precautions as necessary
  - Single room preferred
  - Influenza
  - Mumps
  - Invasive group A strep (<24 hours antibiotics)
  - Meningococcal meningitis (< 24 hours antibiotics)

Improving Infection Prevention Outcomes

- **Influenza**
  - Most frequent cause of death from a vaccine preventable disease in the US
  - In SOT patients, influenza infection has been implicated in allograft rejection
  - SOT patients should receive influenza vaccination

- Centers For Disease Control: National Center for Immunization and Respiratory Diseases: 2009
- Janoff,G, Kunisak, K.*The Lancet Infectious Diseases: 2009: Vol 9: 493-504*

Improving Infection Prevention Outcomes

- **Enteric Precautions:**
  - Unexplained or suspected infectious diarrhea
  - Management of environment essential
  - Cleaning /disinfection
  - Dedicated toilet/ commode/ equipment
  - C Diff
  - Norovirus
  - Acute hepatitis A

Improving Infection Prevention Outcomes

- ***C Diff:***
  - Most common cause of infectious diarrhea in the hospitalized patient
  - SOT patients have risk factors that increase susceptibility to CDI:
    - Antibiotic use
    - Low serum antibody response to toxin A
    - Prolonged hospititalization
  - **Mattihas et al:** ***Nephrology Dialysis Transplantation: 2004:19(10) : 2432-2436***

Improving Infection Prevention Outcomes

- **Norovirus:**
  - Most common cause of acute gastroenteritis
  - In immunocompetent population: recovery is usually quick
  - Can be more severe in the SOT patient
  - Viral shedding may be prolonged
  - Report from Germany (2009) described 2 patients (post renal transplant) who experienced norovirus shedding for 3-7 months
  - Westoff et al: *Exceptional Case: Nephrology Dialysis Transplant : 2009 24 (3) : 1051- 1053*

A Dedicated Toilet Area is Essential For Effective Enteric Precautions

Improving Infection Prevention Outcomes

- **Strict Precautions (Isolation)**
  - Creates a physical barrier
  - Gloves, gown and mask (MRSA)
  - For staff and visitors
    - VRE
    - MRSA

Strict Precautions (Isolation)

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE(+) Patient Environment
Hayden M. ICAAC, 2001, Chicago, IL

Airborne Precautions

Improving Infection Prevention Outcomes

- **Airborne Precautions:**
  - Negative pressure ventilation in room
  - Staff: fit tested N95 respirator*
    - Active pulmonary TB
    - Disseminated shingles
    - Varicella
    - Measles
  - The immunocompromised patient is at risk for TB and disseminated shingles
  - Latent TB may be reactivated in the immunocompromised patient
  - ***N95 not required for staff for varicella and disseminated shingles in immune staff

Improving Infection Prevention Outcomes

- **The Environment:**
  - is rarely a infection risk to immunocompetent patients
  - A risk to the immunocompromised
  - Environmental opportunistic pathogens
    - Aspergillis
    - Legionella

  In addition to general cleaning and disinfection:
  construction/renovation must be monitored
  any water damage/leaks reported

Improving Infection Prevention Outcomes

- Cleaning and general housekeeping of the unit with as little dust production as possible
- Bottled water policy
- Fresh flower policy

- Staff:
  - Practice hand hygiene
  - Should be immunized (hepatitis, influenza,)
  - Adherence to best practice guidelines

Role Of Infection Prevention and Control

- Hand hygiene audits
- Environmental audits
- Equipment procurement
- Oversee construction/renovation: CSA guidelines
- Targeted surveillance
  - Bacteremia
  - ARO (MRSA, VRE, ESBL)
  - Pneumonia (ICU/IMCU)
  - SSI
  - *C diff*

Role Of Infection Prevention and Control

- **Surveillance Data:**
  - Collected using standard definitions
  - Canadian Nosocomial Infection Surveillance Program (CNISP) provides benchmarks
  - Infection rates are provided to the health care teams on the unit

Outbreak Management

Education and Consultant

Collaborative Team Effort, Support and Communication Is The Key!

Team Collaboration

- 6B :*C diff* activity: Transplant Unit
  - Increase in lab confirmed cases (6 cases in 5 weeks)
  - Infection control investigation initiated
  - Pts moved to private rooms
  - Environmental cleaning enhanced
  - Housekeeping initiated enteric cleaning (2 step: ultraquat followed in 10 min with dilute javex)
  - Enteric measures initiated on all patients with unexplained diarrhea
  - Lab saved specimens to be typed
  - Close communication and monitoring by health care team and infection prevention and control

Conclusion

- The gift of an organ is life changing for the patient who receives it.
- The health care team can help ensure that recovery is not complicated by a preventable infection!

Thank- You !

- Questions?