

Post-transplant Infections

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Although the rates are markedly decreased from previous decades, infection is the most important cause of early morbidity and mortality following transplantation. Infection is closely linked to the degree of immunosuppression and thus to the frequency and intensity of rejection and its therapy. The potential sources of infection in the transplant patient are multiple, including organisms from the allograft itself and from the environment. Patients should be advised to be sensible to possible exposures and to wash their hands thoroughly when exposed to infected individuals or human excrement, specifically, exposures in daycare and occupational settings as well as during gardening and pet care. In those taking immunosuppressive agents, signs and symptoms of infections are frequently blunted until disease is far advanced. Therefore, due to the unusual nature of the infections and the lack of timely symptom development, the key to patient survival is the prevention of infection. Infections may be prevented by pretransplant vaccinations, along with prophylactic medications, preemptive monitoring and behavior modification.

Currently, the most common infectious problems within the first month following transplantation are bacterial infections of the wound, lines, and lungs. Additionally, herpetic stomatitis is common. Beyond 1 month following transplantation, infections are related to more intense immunosuppression and include viral, fungal, protozoal, and unusual bacterial infections. Although hepatitis may occasionally cause fulminate and fatal disease if acquired peritransplantation, the manifestations of hepatitis B or hepatitis C infections occur years following transplantation.

CHAPTER

10

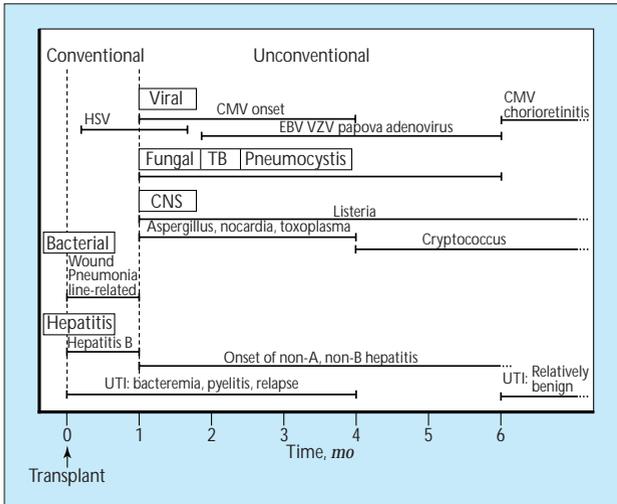


FIGURE 10-1 Timetable for the occurrence of infection in the renal transplant patient. Exceptions to this chronology are frequent. CMV—cytomegalovirus; CNS—central nervous system; EBV—Epstein-Barr virus; HSV—herpes simplex virus; UTI—urinary tract infection; VZV—varicella-zoster virus. (Adapted from Rubin and coworkers. [1]; with permission.)

CLASSIFICATION OF INFECTIONS OCCURRING IN TRANSPLANT PATIENTS

- Infections related to technical complications*
 - Transplantation of a contaminated allograft, anastomotic leak or stenosis, wound hematoma, intravenous line contamination, iatrogenic damage to the skin, mismanagement of endotracheal tube leading to aspiration, infection related to biliary, urinary, and drainage catheters
- Infections related to excessive nosocomial hazard
 - Aspergillus* species, *Legionella* species, *Pseudomonas aeruginosa*, and other gram-negative bacilli, *Nocardia asteroides*
- Infections related to particular exposures within the community
 - Systemic mycotic infections in certain geographic areas
 - Histoplasma capsulatum*, *Coccidioides immitis*, *Blastomyces dermatitidis*, *Strongyloides stercoralis*
- Community-acquired opportunistic infection resulting from ubiquitous saprophytes in the environment†
 - Cryptococcus neoformans*, *Aspergillus* species, *Nocardia asteroides*, *Pneumocystis carinii*
- Respiratory infections circulating in the community
 - Mycobacterium tuberculosis*, influenza, adenoviruses, parainfluenza, respiratory syncytial virus
- Infections acquired by the ingestion of contaminated food/water
 - Salmonella* species, *Listeria monocytogenes*
- Viral infections of particular importance in transplant patients
 - Herpes group viruses, hepatitis viruses, papillomavirus, HIV

*All lead to infection with gram-negative bacilli, *Staphylococcus* species, and/or *Candida* species.
 †The incidence and severity of these infections and, to a lesser extent, the other infections listed, are related to the net state of immunosuppression present in a particular patient.

FIGURE 10-2 Classifications of infections occurring in transplant patients. (Adapted from Rubin [2]; with permission.)

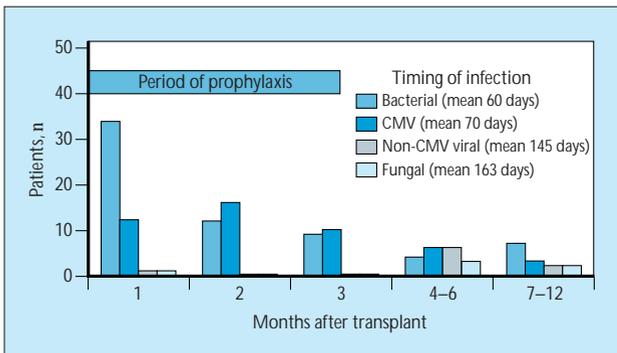


FIGURE 10-3 Timing of infections following kidney/pancreas transplantation at a single transplantation center using antiviral (ganciclovir IV followed by acyclovir) and antibacterial (trimethoprim-sulfamethoxazole) prophylaxis. CMV—cytomegalovirus. (From Stratta [3]; with permission.)

Preventive Strategies

INFECTIOUS DISEASE HISTORY TO BE TAKEN PRIOR TO TRANSPLANTATION

1. Past immunizations.
2. Past infections or exposures to infections.
 - A. Bacterial
Rheumatic fever, sinusitis, ear infections, urinary tract infections, pyelonephritis, pneumonia, diverticulitis, tuberculosis
 - B. Viral
Measles, mumps, varicella, rubella, hepatitis
3. Chronic or recurrent infections, such as pneumonia, sinusitis, urinary tract infection, or diverticulitis
4. Surgical history, such as splenectomy
5. Transfusion or previous transplant history and dates
6. Past travel history, including military service
7. Past immunosuppressive drug treatment (eg, for asthma, renal disease, or rheumatologic disease)
8. Lifestyle
 - A. Smoking, drinking, illicit drug use, marijuana smoking
 - B. Sexual partners, orientation, unprotected contact and date, safety practices used, sexually transmitted diseases, genital warts
 - C. Food, consumption of raw fish or meat, consumption of unpasteurized products, such as milk, cheese, fruit juices, or tofu
 - D. Avocation—gardening and the use of gloves, cleaning sheds, hiking, camping, water sources, bathing pets, cleaning pet litter and cages, hunting practices
 - E. Vocation—jobs that require exposure to possible infectious agents, such as daycare, ministry, small closed offices, garbage collections or dump workers, construction workers, forestry workers, health care, veterinarians, farmers

FIGURE 10-4

Infectious disease history to be taken prior to transplantation.

PRETRANSPLANT VACCINATIONS OR BOOSTERS TO BE GIVEN TO ALL TRANSPLANT RECIPIENTS UNLESS RECENT ADMINISTRATION CAN BE DOCUMENTED

1. Td (Tetanus toxoid, diphtheria)
2. Pneumococcal vaccine
3. Hepatitis B
4. Influenza

FIGURE 10-5

Pretransplant vaccinations or boosters to be given to all transplant recipients unless recent administration can be documented.

PRETRANSPLANT VACCINATIONS TO BE GIVEN IF SERONEGATIVE OR PAST INFECTION BY HISTORY CANNOT BE DOCUMENTED

1. Measles-mumps-rubella vaccine
2. Polio
3. Varicella (0.5 mL subcutaneously followed by booster of 0.5 mL in 4–8 weeks)
4. *Haemophilus influenzae* type B

FIGURE 10-6

Pretransplant vaccinations to be given if seronegative or past infection by history cannot be documented.