

Opportunistic infection

Infections that cause a disease only when the host's immune system is impaired. The classic opportunistic infection never leads to disease in the normal host. The protozoon *Pneumocystis carinii* infects nearly everyone at some point in life but never causes disease unless the immune system is severely depressed. The most common immunologic defect associated with pneumocystosis is acquired immune deficiency syndrome (AIDS).

A compromised host is an individual with an abnormality or defect in any of the host defense mechanisms that predisposes that person to an infection. The altered defense mechanisms or immunity can be either congenital, that is, occurring at birth and genetically determined, or acquired. Congenital immune deficiencies are relatively rare. Acquired immunodeficiencies are associated with a wide variety of conditions such as:

- (1) The concomitant presence of certain underlying diseases such as cancer, diabetes, cystic fibrosis, sickle cell anemia, chronic obstructive lung disease, severe burns, and cirrhosis of the liver;
- (2) Side effects of certain medical therapies and drugs such as corticosteroids, prolonged antibiotic usage, anticancer agents and alcohol
- (3) Infection with immunity-destroying microorganisms such as the human immunodeficiency virus that leads to AIDS;
- (4) Age, both old and young;
- (5) foreign-body exposure, such as occurs in individuals with prosthetic heart valves, intravenous catheters, and other indwelling prosthetic devices.

Virtually any microorganism can become an opportunist. The typical ones fall into a number of categories and may be more likely to be associated with a specific immunologic defect.

Examples include:

- (1) **gram-positive bacteria:** both *Staphylococcus aureus* and the coagulase-negative *S. epidermidis* have a propensity for invading the skin and as well as catheters and other foreign implanted devices;
- (2) **gram-negative bacteria:** the most common is *Escherichia coli* and the most lethal is *Pseudomonas aeruginosa*; these pathogens are more likely to occur in cases of granulocytopenia (granulocyte deficiency, as occurs in leukemia or chemotherapy);
- (3) **Acid-fast bacteria:** *Mycotuberculum tuberculosis* is more likely to reactivate in the elderly and in those individuals with underlying malignancies and AIDS;

(4) **Protozoa:** defects in cell-mediated immunity, such as AIDS, are associated with reactivated infection with *Toxoplasma gondii* and *Cryptosporidium*;

(5) **Fungi:** *Cryptococcus neoformans* is a fungus that causes meningitis in individuals with impaired cell-mediated immunity such as AIDS, cancer, and diabetes; *Candida albicans* typically causes blood and organ infection in individuals with granulocytopenia.

Treatment

- ✚ The first step in treatment of opportunistic infections involves making the correct diagnosis, which is often difficult as many of the pathogens can mistakenly be thought of as benign.
- ✚ The second step involves administration of appropriate antimicrobial agents.
- ✚ The third step, if possible, the underlying immune defect needs to be corrected.

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