Infections in immunocompromised patients

Immunocompromised patients have weakened natural defense mechanisms. In such cases, infections are often caused by low virulence pathogens (opportunistic microorganisms). Infections with virulent microorganisms have a more severe course than in immunocompetent people and there is a greater tendency to chronicity and persistence. By immunosuppression we mean a condition in which the immune system is weakened iatrogenically, for example by the use of corticosteroids. The absence or alteration of the immune response modifies the clinical picture of the disease, which then does not have a typical course. Even severe infections can occur without fever, which obscures the true severity of the condition. In patients with immunodeficiency, early diagnosis and immediate initiation of appropriate treatment is very important, as infections can be fatal in more advanced stages. Infection (plus recurrence) is usually the first manifestation of immunodeficiency.

Period of natural immunocompromisation

1. age over 65
2. first week of life in neonates
3. the last trimester of pregnancy

Specific groups of immunocompromised patients

- oncology patients (mainly hematooncology)
- diabetics
- immunosuppressive treatment (corticosteroids)
- critically ill patients (ICU)
- patients who have undergone splenectomies
- patients after transplantation

Infections in diabetics

Hyperglycemia creates a favorable environment for the survival and multiplication of bacteria, because it is an important substrate for their growth. In addition, it weakens the inflammatory response in the respiratory tract and the bactericidal function of macrophages. Diabetic vascular damage (diabetic angiopathy) also helps to weaken the immune system, making the vessels less permeable to leukocytes, which reduces their ability to migrate to infected areas of the body.

Skin and mucosal infections

Of the skin and mucous membrane infections, the most common in diabetics are mycoses, more specifically candidiasis.

Fungal infections

- candidiasis: recurrent vulvovaginal mycosis in women (candidal vulvovaginitis), recurrent balanitis in men
- intertrigo: mycosis at the folds of the skin, joints, between the fingers (interdigital mycosis), under the breasts, in the axillae, and in the groin area
- onychomycosis

Bacterial superinfection

These are secondary infections, where the gateway to pathogenic bacteria is a fungal infection. *Streptococcus pyogenes* is the causative agent of erysipelas, cellulitis, or necrotizing faciitis. *Staphylococcus aureus* leads in the most severe cases to osteomyelitis.

Urinary tract infections are also more common in diabetics. In contrast, diabetes does not increase the incidence of viral infections, respiratory tract infections, and pneumonia.

Febrile neutropenia

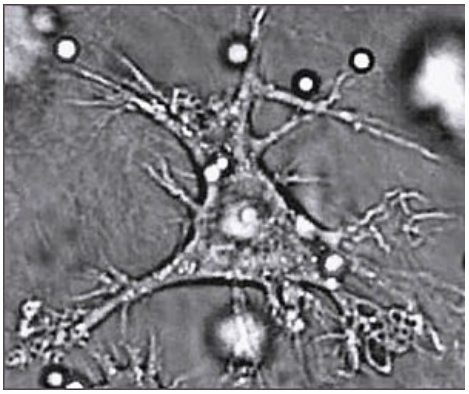
Febrile neutropenia refers to a condition in which the number of neutrophilic granulocytes is reduced below $500/mm^3$ (often in the oncological treatment of hematogenous malignancies) and at the same time two febrile peaks above 38 °C are recorded or one febrile peak above 38.5 °C. Febrile neutropenia is one of the conditions in which immediate administration of antibiotics is indicated, although only one third of neutropenic fevers are infectious. The other two thirds are caused by the breakdown of tumor cells or a toxic response to treatment. The antibiotic tazocin (piperacillin + tazobactam) is administered, to which the most common pathogens - gram-negative enterobacteria - are sensitive. Colony stimulating factors (GM-CSF, G-CSF) are also used. In a situation where the granulocyte count is less than $500/mm^3$, colony stimulating factors may be administered prophylactically in the absence of fever. Before starting treatment, blood should be taken for blood cultivation and swabs from the mucous membranes and skin should be performed to determine the cause of the infection.

🔎 *For more information see Febrile neutropenia.*

Complement disorders

Activated components of the complement cascade serve as important opsonins and act chemotactically on phagocytic cells. Complement is activated on bacterial surfaces or on an Fc fragment of an antibody. In its deficiency, macrophages are unable to bind to and phagocytose encapsulated pathogens. Recurrent infections with encapsulated bacteria, such as pneumococcus, meningococcus, gonococcus, and Hemophilus, are typical for this defect. Infections are more often fulminant. These infections can be prevented by vaccination, as the antibodies produced then complement the opsonization function of the complement. Patients are also instructed to seek medical attention immediately after a fever and to be prescribed the broad-spectrum antibiotic co-amoxicillin.

🔎 *For more information see Complement.*



Dendritic cell is the most efficient APC due to its large surface area