

Immune disorders

Reduced immunity

 For more information see *Immunodeficiency*.

Decreased immunity, ie immunodeficiency, is manifested by **increased susceptibility to infections** (a disorder of defense against pathogenic and possibly opportunistic microorganisms), they may also contribute to the development of **cancer, and chronic inflammation**.

We distinguish between immunodeficiencies:

- congenital, caused by a genetic disorder,
- acquired due to a number of causes (metabolic disorders such as diabetes mellitus, ionizing radiation, protein loss - proteinuria, burns, surgical stress, cancer, treatment with immunosuppressive agents, chemotherapy, HIV infection, etc.).

The clinical manifestations of both primary and secondary immunodeficiencies depend on which system is affected.

- Antibody immunodeficiencies (B lymphocytes, antibodies) have a marked tendency to microbial infections (otitis, sinusitis, pneumonia).
- Fungal, parasitic and viral infections occur in cellular (T lymphocytes).
- Disorders of the phagocytic system (granulocytes, macrophages) are manifested by a tendency to recurrent superficial skin infections, but also septicemia.
- Immunodeficiency in the complement system is recurrent pyogenic infections or atypical course of systemic diseases.

Secondary immunodeficiencies are significantly less severe than primary, and their differentiation into individual types (antibody, cellular, phagocytic, complement) is not clearly possible, they are mostly complex.

- **Recurrent common infections** - inflammation of the airways, tonsillitis,...
- **Opportunistic pathogens:**
 - mycotic: superficial, deep (candida, aspergillus),
 - viral: encephalitis, pneumonia (herpes simplex virus, cytomegalovirus)
- **Laboratory tests** - leukocytopenia, thrombocytopenia.

Examples:

- Immunoglobulin A deficiency,
- Agranulocytosis, neutropenia,
- AIDS.

Increased immunity

= **hypersensitivity**.

It is an **inappropriate and excessive response to an exogenous antigen** (allergy) or an **endogenous antigen** (autoimmunity) that damages the body.

- Also referred to as hypersensitivity reaction or hypersensitivity, formerly allergic reaction (in some textbooks it is called allergy).

Hyperreactivity can only be linked

- for the production of antibodies, eg in atopic individuals the production of IgE for exogenous antigens - allergens, which in people without atopy elicit a normal antibody response (IgM, IgG, IgA).
- At other times, hypersensitivity (hyperreactivity) is associated with excessive production of antibodies or autoantibodies to a specific autoantigen.
 - These specific antibodies, upon binding to the appropriate autoantigens, and trigger a damaging response through complement or NK cells, or by the accumulation of immunocomplexes, followed again by damage with phagocytosis activation.
- One of the hypersensitivity reactions is bound to specific autoreactive T cells, which cause direct cell damage with the corresponding autoantigen in cooperation with macrophages.

There are 4 types:

Anaphylactic, immediate

An excess of IgE antibodies is formed after repeated contact with the antigen. These bind to receptors Mast cells after the antigen-antibody complex is formed. Mast cells release mediators, which cause increased vascular permeability and smooth muscle contractions.

Manifestations: hives, reddening of the skin, bronchoconstriction, swelling of the larynx, diarrhea, vomiting.
Death can occur by suffocation or anaphylactic shock from capillary permeability.

Examples: penicillin allergy, anesthetic, hay fever, asthma, ...

 For more information see *Type I immunopathological reaction*.

Cytotoxic antibody

The antigen "sits" somewhere in the body (eg the glomerulus) and the antibody that circulates in the blood binds to it. The antibody may activate or block cellular activity, trigger a complement response or cytotoxicity mediated by cells and antibodies.

Examples: hemolytic anemia, glomerulonephritis Goodpasture, myasthenia gravis, Graves-Basedow disease

 For more information see *Immunopathological reaction II. type*.

Immunocomplex

Immunocomplexes activate neutrophils, which release lytic enzymes. As a result, the tissue around the antigen and fibrinoid necrosis are destroyed.

Examples: post-streptococcal glomerulonephritis, rheumatoid arthritis, vasculitis, serum sickness, SLE

 For more information see *Immunopathological reaction III. type*.

Cell-mediated

Activated macrophages and T-lymphocytes release toxic products into the environment. The result is the destruction of antigen and surrounding tissue.

Examples: TB, contact eczema, graft rejection

 For more information see *Immunopathological reaction IV. type*.

Links

Related Articles

- Allergy
- Autoimmune diseases
- Immunodeficiency

Used literature

- STŘÍTESKÝ, Jan. *Pathology*. 1. edition. 2001. ISBN 80-86297-06-3.
- ŽÁK, Aleš – PETRÁŠEK, Jan. *Basics of internal medicine*. 1. edition. Galen, c2011. pp. 89-111. ISBN 978-80-7262-697-7.