

Immunopathological reaction III. type

Immunopathological reaction based on the **formation of immunocomplexes** (*type III reaction, Arthus type*) is a **humoral immunopathological reaction**. It is partially similar to atopy, but **is caused by IgG**.

Antibody with antigen forms an immunocomplex. It depends on the amount, size, structure, physico-chemical properties, whether the immunocomplexes will be phagocytosed, or whether they will be stored in the tissues.

Principle

Immune complexes either bind to Fc-receptors or activate complement and thereby trigger a cascade of damaging reactions (the main role is played by neutrophils, auxiliary activated mast cells). This results in an inflammatory response (can become chronic).

Reaction time is long. The reaction occurs only after the formation of a sufficient amount of antibodies, i.e. after approximately 2 weeks. A transient immune complex reaction leads to the removal of the infectious agent by a *physiological* mechanism.

Manifestations accompany most acute infections (pain joints, muscles, etc.). A **pathological** reaction occurs when there is an excessive dose of antigen.

Immunocomplexes most often settle in the kidneys, on the surface of the endothelium, in joint synovium.

Symptoms are glomerulonephritis, vasculitis, arthritis. The so-called **serum sickness** develops after the administration of therapeutic *xenogenic serum*.

The **Arthus reaction** is an experimental model of serum sickness. It involves sensitization of the animal with an antigen and subsequent induction of a local reaction by intradermal injection of the antigen.

Examples of diseases

- **Serum sickness.**
- **Farmer's lung:** IgG against various inhaled antigens (fungal, hay components).
- **Systemic lupus erythematosus:** autoimmune, autoantigen of the cell nucleus component.
- **Cryoglobulinemia:** the immune complex is formed by pathological and normal immunoglobulin.
- **Rheumatoid arthritis:** in some symptoms, immunocomplexes are formed by rheumatoid factors, i.e. antibodies against Fc-fragments of other antibodies.
- **Sterile consequences of infectious diseases:** tissue damage of an autoimmune nature occurs in susceptible individuals after an infectious disease, develops poststreptococcal glomerulonephritis, carditis with joint rheumatism, postinfectious arthritis after chlamydial, salmonella, shigella diseases in individuals with HLA-B27.
- **Arthus phenomenon** - local necrosis at the site of repeated antigen injection.

Prognosis

Most immune complex reactions resolve with the elimination of the source of antigens. Only in the case of autoantigens (*SLE*) can deterioration and chronic damage occur.

Links

Related Articles

- Allergy
- Immunopathological reaction type I
- Immunopathological reaction II. type
- Immunopathological reaction IV. type

External links

- Immunopathological reaction III. type - Youtube video (https://www.youtube.com/watch?v=SyxzU2SI_Yw)

References

- HOŘEJŠÍ, Václav – BARTŮŇKOVÁ, Jiřina. *Základy imunologie*. 3. edition. Triton, 2008. 280 pp. ISBN 80-7254-686-4.

