Immune system of children

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Abstract.
The major components of host defense include anatomical barriers, and the innate and adaptive immune systems. Integrity of the anatomical and mucociliary barrier (i.e., skin and mucous membranes) is essential for protection against infection, and defects in this barrier function can lead to infections. The innate immune system acts as the first line of defense against pathogens, responding rapidly but nonspecifically before the development of the more versatile adaptive immune system.

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non specific protective factors
cellular immunity
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MEDICINE AND PHARMACY

INTRODUCTION:
Lymphoid organs and tissues of the human body: thymus, spleen, lymph nodes. Group lymph follicles (Peyer's patches) and other lymphoid accumulations. Bone marrow and peripheral blood lymphocytes constitute a single organ of the immune system.

The immune system responds to foreign substances and provides protection against bacteria, viruses, parasites, elimination of dying and mutationally changed body cells, anti-cancer protection.

Features of acquired (adaptive) immunity:
T and B-lymphocytes equipped antigen presenting receptors and which carry out the process of antigen recognition, differentiation of one's own and another when need tum on mechanisms products antibodies, immunoglobulins or T lymphocytes, killers with specifics by relation to antigens that caused their education by measure subsidence immune reactions remains specific immunological memory.

Development of immunity
Prenatal period
By the 20 weeks of gestation, all the organs and cells of the immune system are already formed, but they are not functionally active enough. The main protection is provided by maternal.

By 15-20 weeks of gestation, all the organs and cells of the immune system are already formed, but they are not functionally active enough. The main protection is provided by maternal antibodies.

Development of Extrauterine period
The development of the body's immune system continues throughout childhood. The immune system of newborns is in a state of physiological depression, which prevents the risk of severe immunocomplex pathology. The suppressive activity of the immune system persists throughout the first year of life.

Non-specific protective factors
In newborns, the processes of activation of the complement system are weakened. Physiological deficiency of Interferons immunity. A large amount of early Interferon (IF-a) with low antiviral, antitumor, immunomodulatory properties. Synthesis of IF-y is limited. From 1 to 3 years, the synthesis of all
types of IF (a. 13. y) is formed, but their number reaches the adult level by 8-10 years

Five "critical" periods in the development of the child's immune system
- 1st month of life
- 3-6th month of life
- 2nd year of life
- 4-6th year of life
- Adolescence age (for boys - 14-15 years; for girls - 12-13 years old)

The first "critical" period
Leukogram on the 5th day. High passive humoral immunity due to maternal antibodies. Synthesis of own, immunoglobulins is low, with the exception of lgM. Incompletion of phagocytosis, chemotaxis and migration.

The second "critical" period
The suppressor orientation of immune reactions is preserved in severe lymphocytosis in the blood. The content of maternal immunoglobulins drop too critical values. Synthesis of own, immunoglobulins is very weak.

The immune response, predominantly primary. without the preservation of immune memory C Low level and poor development of local protraction factors.

The third "critical" period
There is a functional activity of lymphocytes. primarily CO4. The suppressor orientation is replicas by the predominance of the helper function. The low level and weak development of local protection.

The fourth "critical" period
Formation of immunological memory cells or infections. The level of lgA has not yet reached the final values. the content of lgE increases. In most children, local protection factors are still in effect.

The fifth "critical" period
Stimulation of the secretion of sex hormones (especially
androgens) leads to suppression of the cellular link of immunity and stimulation of the humeral link of immunity.

**Cellular Immunity**

The total number of lymphocytes and the number of T cells (normally, in children 7-14 years old, T cells make up 70% of all lymphocytes, their absolute number is 1400 cells /μl) X Relative and absolute number of CD3(mature) T-lymphocytes and their two main subpopulations· CD4 (helpers) and CD4 (killers) and the ratio of CD4+/CD8. The total number of B-lymphocytes in peripheral blood (normal in children aged 7-14 years 8-cells 25% of all lymphocytes. the absolute number 500 cells/μl) Relative and absolute number of 8-lymphocytes COl 9, C020. Relative and absolute number of subpopulations of T-lymphocytes: Th1 type, Th2 type Cytokines produced by Th1 and 2 types (IF-γ, IL-2, IL-4, IL-S). Killer lymphocytes (T-killers, NK-cells, etc) with the determination of the ability to Produce granzymes and perforin.


**Semiotics Of violations**

The main types of disorders in the immune system Immunodeficiencies state (IDS) - quantitative or functional insufficiency of one of the immune system (primary and secondary).

**Autoimmune diseases**

The first reported primary immunodeficiency in 1952. caused by a single genetic defect Ogden Carr Bruton (14 June 1908 - 20 January 2003) was a paediatrician and chief of paediatrics at Walter Reed Army Hospital, where he organized the first paediatric residency at this hospital. He made important advances in the field of immunology as an immunologist.

**Atopic diseases**

are based on immune hypersensitivity to natural allergens, mediated by lgE M Atopy is defined as the genetically determined ability of the body to increase the production of lgE associated with the Th2-cell immune
response to exogenous or endogenous allergens. Atopy is characterized by excessive secretion by mast cells, eosinophils, basophils of mediators of allergic inflammation of histamine and leukotrienes. Atopy predisposes to such diseases as bronchial asthma, atopic dermatitis, allergic rhinitis and conjunctivitis, gastrointestinal forms. allergy, anaphylaxis.

**The main markers of**

- Increase concentration allergen-specific IgE in blood increase level general IgE in blood and secrets eosinophilia in general analysis of blood and secrets; E increase level eosinophilic cationic protein in blood and secrets E increase quantities from subpopulations of Th2 type T.
- Lymphocytes increase concentration cytokines produced by Th2 type: IL-4, IL-5; H positive skin tests with allergens by immediate type E ability target cells reply on contact with allergen elevated secretion of histamine, leukotrienes and other mediators bronchial and skin hyperreactivity.

**COMMON MISCONCEPTIONS REGARDING CONTRAINDICATIONS TO IMMUNIZATION**

Many misconceptions exist regarding contraindications to immunization. According to the AAP, the following are not appropriate contraindications to immunization:

- A mild acute illness characterized by a low-grade fever or mild diarrhea in an otherwise well child
- Antimicrobial therapy or being in the convalescent phase of an illness.
- A reaction to a previous dose that involved only soreness, redness, or swelling in the immediate vicinity of the vaccination site or a temperature 105-degree F. A household contact who is pregnant

**CONCLUSION:**

The immune system plays a critical role in defending the body against pathogens and maintaining overall health. Its complex network of cells, tissues, and organs works together to identify and neutralize threats, providing a vital defence mechanism. Understanding and supporting the immune system through a healthy lifestyle can contribute to a robust and effective immune response.
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