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PATHOPHYSIOLOGY

CONCISE LECTURES, TESTS,
CLINICO-PATHOPHYSIOLOGICAL SITUATIONS
AND CLINICO-LABORATORY CASES

STUDENT MANUAL

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I. LECTURES

1. THE SUBJECT MATTER OF PATHOPHYSIOLOGY. GENERAL NOSOLOGY

The human being is the common object of studies of all medical disciplines. Some of them (for instance, anatomy and physiology) study and describe human activity in normal conditions or develop «normology» of a human being. Most of the medical disciplines study the nature and mechanisms of a patient's vital activity or a human being's pathology. Pathophysiology is among them.

Pathophysiology is the part of medicine and biology which investigates and describes actual causes, mechanisms and regularities of onset, development and outcomes of pathological process and disease; formulates principles and methods of their diagnostics, treatment and prophylaxis; develops the doctrine of a disease and an ailing body; formulates theoretical guidelines in medicine and biology.

The above is presupposed by the etymology of the term «pathophysiology»: from Greek *pathos* — suffering, illness; *physis* — nature, essence; *logos* — doctrine, science. In other words, pathophysiology is the doctrine of the nature of a pathological process and disease.

COMPONENTS OF THE SUBJECT MATTER OF PATHOPHYSIOLOGY

The object of pathophysiology studying and teaching covers the following three components (fig. 1):

1) disease;
2) typical (stereotypical) pathological processes (e.g. inflammation, fever, hypoxia, extreme conditions, etc.);
3) typical forms of organ and tissue pathology (e.g. anemia, abnormal heart rhythms, respiratory insufficiency, etc.)

Pathophysiology consists of three parts.

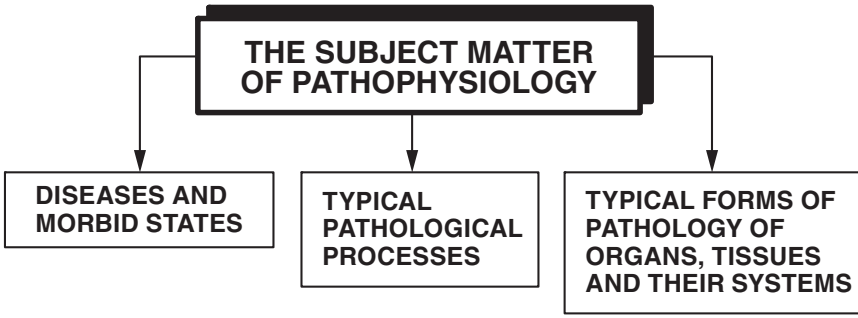

Fig. 1

I. Nosology.

II. Studies of typical pathological processes. Typical are pathological processes that contribute to the pathogenesis of many diseases and syndromes, and serve as their significant and inseparable part.

III. Studies of typical forms of pathology of specific organs and organ systems. Similar to typical pathological processes typical forms of pathology of specific organs and organ systems are also components of various diseases.

Nosology is a science dealing with the description and classification of diseases.

Nosology comprises three divisions:

1. Study of disease which includes:
   a) general concepts and categories of pathology;
   b) classification and nomenclature of diseases;
   c) special aspects of pathology.
2. General etiology which includes:
   a) general features of pathogenic agents;
   b) main groups of pathogenic factors;
   c) the role of conditions and reactivity of the body in the initiation of disease;
   d) principles of etiotropic prevention and treatment.
3. General pathogenesis which includes:
   a) mechanisms of the body resistance to the effects of pathogenic factors;
   b) general mechanisms of diseases;
   c) mechanisms of convalescence;
   d) pathogenesis of dying;
   e) general principles of disease prevention and treatment.

NOSOLOGY

The notion of disease

A disease is a dynamic state of the body characterized by a loss of the well-being which essentially implies a decrease of the biological and social potentials of the individual.

Basic concepts of nosology

Pathological process

Pathological process is a natural progression of changes caused in the body by the action of pathogenic factors. These events include damage with the ensuing dysfunction, accompanied by adaptive reactions. A unique combination of these two processes determines the form of disease and its course.

«Pathological process» is a more general category than «disease». One and the same pathological process, such as thrombosis, hemolysis, or edema, may contribute to the pathogenesis of various diseases.

Some of the complex pathological processes contributing to the pathogenesis of many diseases are called typical. Typical pathological processes are inflammation, allergy, hypoxia, tumor growth, fever, and infection.

Pathological state

Pathological state is a relatively persistent and stable abnormality of the body limiting its adaptive potential.

Pathological reaction

Pathological reaction is an inadequate and harmful reaction of the body or some of its systems to the ordinary (e.g. some foods) or extraordinary (pathogenic) stimuli. Pathological reaction is inadequate in quantitative or qualitative sense and outruns the limits of the individual norm. The examples of pathological reactions are an anaphylactic reaction (a form of allergy), pathological reflexes, inadequate behavioral reactions, etc.

Remission

Remission is a temporary subsidence of symptoms of a disease or improvement of state.

Recurrence

Recurrence means reappearance or exacerbation of symptoms of a disease. In chronic illnesses the recurrence follows the period of remission, and also represents the natural stage in the course of a disease.

Complication

Complication is a pathological process accompanying a disease. It is in fact not obligatory for this disease, but it is caused by the same pathogenic factors, or arises from alterations developed in a primary disease. The examples of complications include nephrotic syndrome in chronic glomerulonephritis, infections after surgical interventions, myocardial infarction in patients with diabetes mellitus, arrhythmia due to coronary insufficiency. Pathological processes that are casually associated with the primary disease or the remote consequences of the disease are usually not viewed as complications.

CLASSIFICATION AND NOMENCLATURE OF DISEASES

Nomenclature is a structured catalogue of diseases and other nosological forms. Classification of diseases is a system of grouping diseases and pathological processes into nosological units. The grouping criteria are different and use various approaches:

- etiology of diseases. For example, infectious diseases, traumas, intoxication, etc.;
- anatomical/topographic features. For example, diseases of the heart, diseases of the respiratory tract, diseases of the gastrointestinal tract, etc.;
- sex and age. For example, diseases of children or adults; diseases of women;
- natural course — acute, subacute, and chronic diseases;
- pathogenic mechanisms. For example, allergies, tumors, malformations, etc.;
- social characteristics. For example, occupational diseases.

ETIOLOGY

Etiology is a science that studies causes and conditions of diseases. There are two major classes of etiological factors: intrinsic or genetic, and acquired