МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

Epilepsy, epileptic paroxysmal symptoms, mental disorders, treatment

Методичні вказівки
для підготовки студентів до практичних занять

Затверджено
вченою радою ХНМУ.
Протокол №4 від 19.04.2018

Харків
ХНМУ
2018

Epilepsy, epileptic paroxysmal symptoms, mental disorders, treatment: Методичні вказівки для підготовки студентів до практичних занять / упоряд. І.М.Стрельнікова, В.М.Сінайко. – Харків, ХНМУ. – 2018. – 17с.

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Epilepsy is a chronic endogenous-organic disease of the brain characterized by partial and generalized spasmodic seizures, typical changes in the character and thinking which achieve the degree of dementia, as well as by a possible development of acute and chronic psychoses at some stages of the disease. According to the WHO's data, 40 million people in the world are ill with epilepsy; the morbidity with this disease, according to different data, is from 6 to 12 cases per 1,000 people. The illness may begin at any age, but most frequently before 20 or after 65 years. A spasmodic seizure is a manifestative sign of the disease.

The classification by the etiological sign distinguishes 3 types of epilepsy: *idiopathic (genuine)*, whose main cause lies in heredity; *symptomatic* – a heterogeneous disease with an established pathology (a disease of the brain), and *cryptogenic*, where there is no genetic factor and any disease of the brain is not found.

The general principles of classification of Epilepsy and epileptic syndromes by ethyology

Idiopathic	- evidential disorders of CNS absents - genetic predisposition is known or probable
Symptomatic	- etiology is known and morphological disorders are determined
Cryptogenic	- a cause is unknown, concealed - the syndromes are not correspond to idiopathic forms - proofs of symptomatic character are absent

The clinical manifestations of epilepsy are represented by paroxysmal and nonparoxysmal signs of the disease. Epileptic paroxysms are subdivided into generalized and partial seizures, as well as various psychic equivalents. The clinical characteristics of an epileptic seizure are as follows: a) a sudden appearance (at any time of day or night, suddenly, irrespective of the situation); b) a short term (as a rule, a paroxysm lasts from a few seconds to several minutes); c) self-withdrawal (the seizure ceases spontaneously); d) recurrence with a tendency towards occurring more frequently; e) a "photographic" similarity of the seizures (clinical manifestations of each subsequent paroxysm almost absolutely coincide with previous seizures).

The most typical generalized epileptic seizures are a major spasmodic seizure, a minor seizure (absence), an epileptic status. A generalized tonic-clonic seizure (grand mal) may be preceded by such precursors as a change in the mood, a headache, a worsened general state developing some hours before the seizure. Just before the seizure some patients feel an aura in the form of stereotyped short-term

(during a few seconds) autonomic, vestibular, sensory, motor, visceral or mental disorders. The seizure itself begins with a sudden fall and consists of two phases: *tonic and clonic*. In *the tonic phase* of the seizure, which lasts 20-30 seconds, convulsions involve all the skeletal muscles. Usually they prevail in the extensors. As a result of contraction of the muscles of the chest and abdomen, the air passes through a narrowed glottis, which may cause vocalization (an epileptic cry) lasting a few seconds, the eyes are usually wide open, the mouth is half-open. The convulsions begin from the muscles of the trunk, whereupon they pass to the extremities. Usually, the shoulder girdle is slightly raised and inwardly displaced. The arms are abducted and outwardly rotated, the forearms are half-bent. The muscles of the legs are not involved so intensively, usually there is a tendency towards bending and parting the legs with their outward turning.

The clonic phase consists of short-term flexion contractions of the muscles of the trunk and extremities with their rapid relaxation. The duration of the clonic phase is 2-3 minutes. Gradually, sharp contractions of the muscles become rarer, gaps of a reduced muscle tone longer, and the spasmodic contractions end. During both phases of the spasmodic seizure, some biting of the tongue and lips may be observed.

A generalized tonic-clonic seizure has such a characteristic component as mydriasis with areflexia of the pupils to the light, as well as hypersalivation which in combination with the tongue bite in the clonic phase of the seizure results in a discharge of some blood-stained foamy contents from the mouth. During a seizure, hypersecretion appears in the salivary and other glands: sudoriferous and tracheobronchial.

Within 10-15 minutes immediately after the seizure, the comatose period comes; it is characterized by muscular atony with resultant involuntary urination because of relaxation of the sphincters. The pupillary and corneal reflexes are absent, while deep ones may be activated. The patients are absolutely unconscious (coma). Later, the mydriasis disappears, superficial reflexes are restored, deep ones are decreased and often accompanied by Babinski’s sign. This period usually lasts 5-15 minutes. After recovery of their consciousness the patients usually complain of a headache, pains in muscles, a bad general state; there is an absolute amnesia for the period of the seizure. The comatose state may also change into postictal (post-seizure) sleep.

Minor seizures (petit mal), absences are characterized by a sudden and short-term (2-30 seconds) disengagement of the consciousness, usually without the patient’s falling down; they are accompanied by the patient’s blank look, an interruption of his current activity, moderately expressed autonomic symptoms (some flushing or paleness of the face, a moderate mydriasis), though in short-term

absences any clinical manifestations of the seizure often remain unnoticed. The seizure ends as suddenly as it began. Realization of the seizure is usually absent, an absolute amnesia develops, but in very short-term absences (2-3 seconds) there is not enough time for an absolute disengagement of the consciousness to develop.

The epileptic status (status epilepticus) is a severe complication of epilepsy: this is characterized by recurrent epileptic seizures and between them the patient's consciousness is not regained. The epileptic status requires urgent medical aid, as it gravely endangers the patient's health and life.

The causes of the epileptic status may be as follows: inadequate treatment, a sharp reduction of dosages or discontinued taking of antiepileptic drug preparations, resistance to them, as well as addition of other hazards (acute infections, intoxications, particularly taking of alcoholic drinks, a brain injury, somatic diseases).

The epileptic status is characterized by disturbance of the respiration, cardiovascular activity, haemocirculation, cerebral metabolism, acid-alkali and water-electrolyte balances.

In addition to the described above, there may be *generalized tonic seizures*, typical for children, and *generalized clonic seizures*, more common in infants, as well as myoclonic seizures characterized by bilateral synchronous manifestations, which are most vividly expressed in the shoulder girdle and arms. With lightning speed, the arms would bend and the fingers part. If the seizure involves the legs, usually they bend too, and the patient would fall down to his knees or even on the ground.

Symptoms of *partial seizures* depend upon the localization of the focus. There are motor, sensory, autonomic-visceral seizures and those with disruptions of psychic functions. The most typical partial motor seizure is jacksonian one in the form of a local jerk or tonic tension in the muscles of the arm or leg, more frequently in its distal parts; the convulsions may spread along the whole extremity with involvement of the muscles of the trunk, face, the other extremity, often resulting in a secondary-generalized spasmodic seizure with loss of consciousness.

Versive seizures usually appear as a result of epileptic discharges in the premotor areas of the frontal cortex or subcortical ones, closely connected with this region. The seizures may be developed by a turn of the head and eyes, as well as the trunk and extremities, in the direction opposite to the affected hemisphere. Such seizures are very frequently accompanied by secondary generalization.

Sensory seizures are observed if epileptic discharges are localized in the projection areas of classical afferent systems. Somatosensory seizures may happen and be in the form of paresthesia, visual, auditory, olfactory and gustatory seizures, as well as fits of dizziness.

Seizures with autonomic-visceral manifestations are observed among partial seizures most frequently. In the majority of cases they are seizures in the form of gastrointestinal manifestations: an unpleasant, sometimes indefinite sensation in the epigastric region, ascending to the throat, often accompanied by the feeling of nausea and vomiting. Children may feel some pain in the abdomen. Cardiovascular and respiratory disturbances may be observed.

Seizures with disruption of psychic functions may have the following manifestations: an absolute or partial paroxysmal motor or sensory aphasia; difficulties in articulation of words and use of speech with preservation of the movements of the muscles necessary for speaking; short-term complex illusions when there is a violation in the assessment of the degree of novelty of the real life situation; an absolute amnesia within a certain, sometimes rather prolonged (a few hours) period of time within which the consciousness was clear and the behavior absolutely adequate; disturbances of thinking when the patients notice that their "thoughts are running or scattering with an unbelievable speed", "they are difficult to follow" or, on the contrary, "the thoughts stick", the thinking becomes retarded, "stiff"; short-term paroxysmal emotional disorders in the form of unpleasant emotional feelings, or sharply expressed fears, anxiety, visual, auditory, olfactory and gustatory illusions; visual hallucinations, usually colored, represented by motionless pictures or scenes with a decelerated or accelerated action; auditory hallucinations (significantly more seldom).

Contraction-free paroxysms are short-term mental disorders developing as a seizure equivalent. The following kinds of contraction-free paroxysms are distinguished:

- *twilight disturbance of consciousness*, accompanied by anxiety, terror, excitement, aggressiveness with a subsequent amnesia; here the patients may have visual, olfactory or auditory hallucinations, delusions of persecution, universal death, grandeur, reforming;
- *delirious state* with vivid visual hallucinations and tense affect;
- *oneiroid state* with a fantastic content of the feelings;
- *ambulatory automatism* in the form of short-term automated actions with an absolute estrangement from the surroundings, a disturbance of consciousness and a subsequent amnesia;
- *fugue* – a state of cloudiness of consciousness when the patients, estranged from their surroundings, would strive for running somewhere;
- *trance* – a prolonged disturbance of consciousness when the patients would move automatically, make unmotivated journeys or trips, sometimes at long distances;

- *dysphoria*, manifested by depression, melancholia, anxiety, maliciousness, tension, aggressive behavior;
- *specific states*, in the form of depersonalization and derealization with phenomena of metamorphopsiae accompanied by fear, melancholia, anxiety, hallucinations.

Personality changes in patients with epilepsy. The course of epilepsy is accompanied by formation of peculiar changes (of the epileptic character) in the personality of the patients, manifesting themselves by egocentrism, a combination of obsequiousness and sugariness with maliciousness, cruelty, vindictiveness, rancour, a so-called polarity of the character. The patients' sphere of interests gets narrowed, they become pedantic, fault-finding, with a tendency towards sudden dysphoric reactions. These patients are characterized by affective torpidity, i.e. sticking to negative emotions, offences, maliciousness which they accumulate in their consciousness; later there is an affective discharge in the form of a sudden aggression with unharnessed energy. In this state the patients are dangerous for their associates. A combination of affective torpidity, explosiveness and polarity of affects in epileptics gives rise to prolonged vindictive tendencies, which persist for years and often end with aggression.

A protracted course of the illness develops epileptic dementia characterized by a change in the thinking, a tendency towards detailing and torpidity, the patients are not able to separate the main things from minor ones. The thinking becomes concrete, there are disturbances of memory and a decreased stock of words. Diminutive and hypocoristic suffixes appear in the patient's speech.

Epileptic psychoses. In epilepsy, acute and protracted psychoses may develop; they are observed in about 40 % of epileptics. The course of acute psychoses may include cloudiness of consciousness (twilight, oneiroid, delirium, amentia) or be without it (acute affective and hallucinatory-paranoid states).

The most common form of acute psychoses with cloudiness of consciousness is a twilight state, which develops after a series of spasmodic seizures and is accompanied by excitement with an mental stress and aggression. Epileptic oneiroid is characterized by vivid fantastic hallucinations accompanied by various emotional feelings: fear, horror, delight.

The most common transitory psychoses without any cloudiness of consciousness are depressive-dysphoric states with a melancholic-malicious mood, delusions of reference, persecution, an increased aggressiveness and excitability. Rarer are depressive states with inhibition, as well as irate and merry maniae. Acute hallucinatory-paranoid psychoses develop vivid imagery delusions, as well as verbal and visual hallucinations. Acute epileptic psychoses are transitory, their onset is acute, the recovery is critical, and they last from a few hours to 1-2 weeks.

Acute psychoses

I. With cloudiness of consciousness (to several day)	- twilight state - after a series or spasmodic seizures - continue to several day - hallucinatory and delirious disorders - psychomotor excitement, aggression - epileptic delirium - epileptic oneiroid
II. Without cloudiness of consciousness (more then one day)	- acute paranoid - dysphoric psychos

Protracted epileptic psychoses originate at remote stages of the disease, 12-14 years after its manifestation. Their duration is from several months to a year or even more. The development of protracted psychoses is accompanied by a decrease in the rate of seizures or their discontinuation, as well as by normalization of EEG. The recovery from this psychotic state is lytic, with possible recurrences of the psychotic symptoms. Paranoic psychoses develop interpretative delusions with an ordinary content whose plot is connected with actions of concrete people and certain psychotraumatizing situations. More common, if compared with others, are ideas of reference, persecution, poisoning, jealousy, the patients being rather frank when they inform about their delirious feelings. In hallucinatory-paranoid psychoses, delusions are formed on the basis of verbal hallucinosis. In some cases, the structure of the main syndrome includes psychic automatisms, mentism. Sometimes in epilepsy there is formation of paraphrenic psychosis with megalomanic delusions having a fantastic content, and with some peculiar interspersing of real events accompanied by enthusiasm. Much less common are catatonia-like states in the form of substupor, mutism, impulsive behavior.

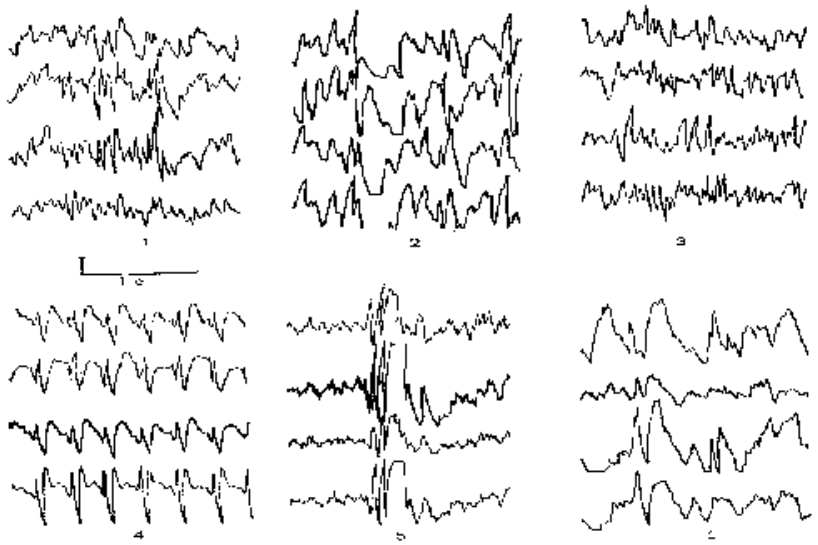
Protracted epileptic psychoses **(schizophrenic like)**

General characteristics:

- they develop after 12-14 years of disease
- tendency towards progradiency;
- with rood change of personality, decrease of intellect;
- most of time without disorders of consciousness ;
- they duration is from several months to several years ;
- more often with temporal localization of focus .

1. Paranoiac
2. Hallucinatory-paranoid
3. Paraphrenic
4. Catatonia-like states

The diagnosis of epilepsy is made on the basis of the following signs: recurrent seizures, changes in the personality, a tendency towards progradiency. Very important signs of the illness are changes on EEG: 1) spikes (peaks); 2) sharp waves; 3) a sharp and a slow wave; 4) a spike and a wave with a frequency of 3 seconds, they are characteristic of typical absences (petit mal); 5) multiple spikes followed by a group of slow waves; 6) slow high-amplitude complexes: a sharp wave and a slow wave (characteristic of atypical absences).



Peculiarities of epilepsy in childhood. In children, the diagnosis and differential diagnosis of epilepsy may be somewhat difficult, as children easily develop spasmodic states owing to various causes (a helminthes invasion, an elevation of the body temperature, diseases of the gastrointestinal tract and pulmonary system, etc.).

This state is determined as an epileptic response: a nonspecific response of the brain in the form of convulsions due to an increased spasmodic readiness of the brain in children. On the other hand, the disease often begins with nonspasmodic paroxysms (absences). It is necessary to pay attention to cases of somnambulism, sudden fears, disturbances in the mood and behavior, attacks of pain in various organs. The course of epilepsy in childhood is more malignant than in adults, often it rapidly gives rise to the formation of developmental defects, a decrease of intellect, changes in the personality. The most frequent syndromes, typical for childhood, are West's and Lennox-Gastaut ones.

West's syndrome (infantile spasms, propulsive fits, nodding spasms) usually consists of a triad: children's spasms in the form of "nods", "pecks", "salaam convulsions", a disturbance of the psychomotor development and typical changes

on EEG. The fits manifest themselves by rapid bending and extending movements of the trunk or in the form of nods of the head, most frequently they are mixed. The illness develops at the age of up to one year, more commonly in boys. On the whole, the prognosis is unfavorable. West's syndrome occurs in two variants: a symptomatic one in an organic lesion of the brain accompanied by a retardation in the psychomotor development, neurological symptoms and other kinds of fits, and an idiopathic one in genuine epilepsy.

Lennox-Gastaut syndrome manifests itself in children at the age from 1 to 8 years, but most frequently at the preschool age. The illness develops both against a background of encephalopathy and in the primary form. The most common are tonic, atonic fits and absences, though other types are also possible: myoclonic, generalized tonicoclonic, partial. The rate of the fits is high, often the epileptic status develops. EEG reveals characteristic changes. The children's mental development is delayed. The fits resist treatment, the course of the disease is often unfavorable.

Etiology and pathogenesis of epilepsy. Epilepsy is a disease with a multiple etiology and based on a change in the neuron activity, which becomes abnormal, periodic and increased with a resultant appearance of sudden high-amplitude outbreaks in a single group of neurons. This group of neurons forms an epileptic focus which generates a hypersynchronous discharge. The character of the subsequent spread of excitement along the neurons determines the kind of fits; thus, if the discharge is spread along both hemispheres then a generalized fit is produced, but if the excitement remains within the limits of the primary focus then a local (focal, partial) fit develops.

The disease strikes mostly children and juveniles. Its etiological factors include hereditary predisposition, as well as an effect of unfavorable environmental factors causing an impairment of the brain, particularly in the pre- and postnatal period. Depending upon its etiology, the primary (idiopathic, genuine) and secondary (symptomatic) types of epilepsy are distinguished. Symptomatic epilepsy may be caused by cerebrovascular disturbances, neural infections, brain injuries, an oedema of the brain, intoxications, degenerative diseases (Alzheimer's disease), endocrine disorders.

In epilepsy, there are disturbances of different kinds of metabolism (of proteins, carbohydrates, fats, water-electrolytes); recently, particular attention is paid to studying disturbances in the metabolism of GABA, whose decrease in the brain develops convulsions.

The treatment of epilepsy must be complex, regular and prolonged. The multimodality treatment should include anticonvulsant dehydration, resolving and general health improving therapy. Prior to the beginning of the treatment it is

necessary to specify the etiology of epilepsy and the type of seizures. If possible, the treatment should be provided with one optimally chosen drug preparation, whose dose would be gradually increased up to the absolute discontinuation of the seizures or to the appearance of any side effect of the drug. Two or more drugs are administered only in case of an insufficient efficacy of the monotherapy owing to an improper choice of drugs, their extremely low doses or an irregular taking.

When treating epilepsy, it is important to reveal the factors contributing to the appearance of seizures, to timely make necessary corrections in the course of the treatment, for instance if any concomitant diseases develop. It is necessary to regulate the way of life, establish a regular regimen of sleep and wakening, avoid any psychoemotional overstrains, limit the patients' watching TV programmes and working in front of a computer monitor. It is important to exercise self-control over taking antiepileptic drugs. Epileptics should follow a milk-vegetable diet, restrict the intake of liquids, salty and spicy foods, meat; the use of strong tea and coffee should be reduced and alcoholic drinks absolutely excluded. In order to treat mental disorders in epilepsy, neuroleptics, tranquillizers and antidepressants are administered.

Characteristics of antiepileptic drug preparations. *Phenobarbital (luminal)* is the main (basic) one in treating epilepsy. The drug increases inhibition of GABA-ergic receptors. Phenobarbital is effective for focal, generalized tonicoclonic and myoclonic seizures. It is administered by 0.1-0.2 g/day as a single or 2 divided doses. For children, the dose of the drug is 4-5 mg/kg. The drug is contraindicated if there is an increased sensitivity to it.

Primidone (Hexamidine, Prilepsine, Misodine). Its main metabolite is phenobarbital. Primidone is indicated for focal, generalized tonicoclonic and myoclonic seizures. The therapeutic dose is 0.75-1 g/day by 2-3 divided doses. The daily dose for children is 10-30 mg/kg.

Benzodiazepines (Diazepam, Valium, Clonazepam, Midazolam, Lorazepam). The mechanism of their action is based on the ability to increase inhibition of GABA-ergic synapses. These drug preparations are indicated for focal seizures, absences, atonic, generalized tonicoclonic seizures in cases of therapeutic resistance to other drugs. The injection and rectal forms of the drugs are used for controlling the epileptic status. The daily dose of Diazepam is 10-20 mg IV or 20-40 mg rectally, Clonazepam – 0.2 mg/kg, Lorazepam – 4-8 mg, Midazolam – 0.15 mg/kg IM. Benzodiazepines are contraindicated if there is any addiction to them.

Ethosuxemide (Suxilep, Ronton, Pycnolepsin). The drug blocks recurrent discharges of neuron membranes. It is indicated for absences. The drug is administered by a daily dose of 15-20 mg/kg as 2-3 divided doses.

Benzonal is a prodrug of Phenobarbital, it increases inhibition of GABA-ergic receptors. It is administered in major, myoclonic-impulsive, psychic, simple partial seizures. The doses are as follows: children at the age of 3-6 years – 0.1-0.15 mg/kg/day; 7-10 years – 0.3-0.5 mg/kg/day; 11-14 years – 0.3-0.4 mg/kg/day; adults – 0.3-0.8 mg/kg/day; the drug may be taken by 2-3 divided doses.

Valproate (Convulex, Orfiril). The effect of Valproate is based on its ability to increase inhibition of GABA-ergic receptors, thereby decreasing recurrent discharges of neuron membranes. The drug is indicated for generalized epileptic seizures (absences, tonic-clonic seizures), as well as focal ones. The drug is used with a dose of 1.2-1.8 g/day as a single dose or 2-3 divided ones. For children, the dose is 20-30 mg/kg. The drug is contraindicated in cases of hepatic diseases and a hypersensitivity to it.

Carbamazepine (Sirtal, Tegretol, Finlepsin, Thymonil, Stazepine). The effect of the drug is based on its influence on Na channels with a resultant decrease in the number of recurrent discharges of neuron membranes. Carbamazepine is mostly indicated for focal epileptic seizures. It is administered with a dose of 0.8-1.2 g/day. For children, the dose is 10 mg/kg; if necessary, it may be enlarged up to 20-40 mg/kg. Carbamazepine is contraindicated in cases of a hypersensitivity to it and bradycardia.

Vigabatrin (Sabril). The mechanism of its effect is connected with an increased inhibition of GABA-ergic synapses by blocking GABA transaminase. The drug is indicated for therapeutically resistant epileptic seizures, particularly simple and complex focal paroxysms, including secondarily generalized ones, as well as West's and Lennox-Gastaut syndromes. Vigabatrin is administered at a dose of 1-3 g/day as a single dose or 2 divided ones.

Phenytoin (diphenylhydantoin sodium, Alepsine, Phengidan). The effect of the drug is connected with its influence on Na channels and a resultant decrease in the number of recurrent discharges. Phenytoin is indicated for focal and unclassified generalized tonicoclonic epileptic seizures. The dose of the drug is 0.3 g/day as a single dose or 2 divided ones; for children it is 5-8 mg/kg. Phenytoin is contraindicated in cases of a hypersensitivity to it and progressing myoclonus epilepsies.

Lamotrigine (Lamictal). The effect of the drug is based on its ability to decrease recurrent discharges of neuron membranes. This is a drug of choice in cases of therapeutically resistant focal seizures, including secondarily generalized ones; it can be effective in absences and Lennox-Gastaut syndrome. The therapeutic dose is 0.1-0.4 g/day as a single dose or 2-3 divided ones. For children, the dose is 5-10 mg/kg. The drug is contraindicated in case of a hypersensitivity to it.

Gabapentin is a structural analogue of GABA. It increases GABA synthesis, produces an inhibitory interaction with places of stimulating synapses on the membrane. This is a drug of choice in cases of partial and secondarily generalized seizures, which resist other drug preparations, and Lennox-Gastaut syndrome. Often the therapeutic dose is 10-30 mg/day as a single dose or 2-3 divided ones.

Tiagabine blocks GABA formation by neuronal cells and glia, thereby increasing GABA-ergic inhibition. It is administered for simple partial, complex, secondarily generalized and psychomotor seizures. The therapeutic dose is 0.5-1.0 mg/kg/day as a single dose or 2-3 divided ones.

Topiramate (Topamax) blocks strain-dependent sodium channels, potentiates GABA activity in benzodiazepine-free places of GABA receptors, blocks certain types of glutamate receptors of the postsynaptic membrane. It is administered for simple and complex partial seizures with and without generalization, major tonicoclonic seizures, astatic falls in Lennox-Gastaut syndrome; often as an additional drug preparation in cases of resistance to other drugs. The therapeutic dose for patients over 12 years of age is 200-400 mg/day by 2 divided doses.

Acetazolamide is administered at a dose of 10-15 mg/kg/day. The mechanism of its effect is as follows: inhibition of carboanhydrase in glia and myelin with accumulation of CO_2 in the brain, thereby elevating the threshold of spasmodic readiness. It is effective as a drug of the second choice in major, minor and partial complex seizures. It has the following side effects: allergy, hyperpnoea after high doses, a disturbance of consciousness, a higher risk of formation of thrombi, dyspepsia, depression.

Clobazam binds subunits of the GABA-receptor complex potentiating inhibitory effects on the postsynaptic membrane. It is effective as an additional drug preparation for therapy in generalized epilepsy, myoclonic astatic seizures, acute and complex partial seizures. Its side effects are as follows: sleepiness, lack of coordination, muscular hypotonia, as well as salivary and bronchial hypersecretion in little children. Children and old people develop negative psychoactive effects. The dose is 0.3 mg/kg/day for children and 0.3-2.0 mg/kg/day for adults.

Lamictal (Lamotrigine) inhibits strain-dependent sodium channels of the presynaptic membrane and a strain-related discharge of stimulating neurotransmitters of aspartate and glutamate into the synaptic cleft. This drug is effective in forms of seizures which are resistant to other drug preparations, first of all partial, secondarily generalized, as well as primarily generalized, atonic ones, Lennox-Gastaut syndrome. It is commonly used in combined therapy if drugs of the first choice turned out to be ineffective. The dose for children is 2-10

mg/kg/day; if combined with other drugs it is 1-5 mg/kg/day. The dose for adults is 100-200 mg/day.

Midazolam binds subunits of the GABA-receptor complex potentiating inhibitory effects on the postsynaptic membrane. It is effective for all forms of the epileptic status. It is used as an additional drug preparation in all kinds of seizures, particularly myoclonic ones. The side effects are as follows: dose-dependent sleepiness, lack of coordination, muscular hypotonia, skin eruptions; children and old people develop negative psychoactive effects. The dose is 7-15 mg/kg/day for children and 15-45 mg/kg/day for adults.

Sulthiame inhibits carboanhydrase in glia and myelin with accumulation of CO_2 in the brain, thereby elevating the threshold of spasmodic readiness. It is effective as a drug of the second choice in epilepsy with continuous spike/wave complexes during a slow-wave sleep, as well as in benign psychomotor epilepsy. It has the following side effects: allergy, hyperpnoea, tachypnoea (particularly in children), a loss of appetite and body weight, and possible paresthesiae. The dose is 5-15 mg/kg/day.

The epileptic status should be controlled, if possible, under in-patient conditions. At first, Diazepam (Sibazon, Lorazepam) is administered IV slowly by 10-20 mg of 0.5 % solution in 20 ml of 40 % glucose. If there is no effect, the administration of Diazepam is repeated 1.5-2 hours later. If the status is not controlled, a slow IV infusion of 40 ml of 2.5 % solution hexenal or sodium thiopental is made (1 g is diluted in 40 ml of NaCl isotonic solution) at a rate of 1 ml per 10 kg of the patient's body weight. Simultaneously, 5 ml of 10 % solution of sodium thiopental or hexenal are injected IM.

Simultaneously with antispasmodic drugs, a lytic mixture is administered: 2 % trimeperidine hydrochloride – 1 ml, 25 % analginum – 2 ml, 1 % diphenylhydramine hydrochloride – 2 ml, 0.5 % novocaine – 2 ml IM.

With the purpose of dehydration, the following drug preparations are administered: 2 % furosemid (Lasix) – 2 ml IM; mannitol with urea by 0.5 g/kg of the patient's body weight in 140 ml of 10 % glucose IV by drops at a rate of 40 drops per minute; ethacrynic acid (Uregit) – 50 mg IV; prednisolone – 1-2 ml IM; Contrical or Trasylol by 10,000-30,000 units in 500 ml of NaCl isotonic solution IV by drops during 4 hours.

With therapeutic and diagnostic purposes, a spinal puncture is made. In order to improve the cardiac activity, 1 ml of 0.06 % corglycon or 0.5-1.0 ml of 0.025 % digoxin IV are slowly administered.

If blood pressure increases, papaverine by 1-2 mg/kg of the body weight, 25 % magnesium sulphate by 10 mg IV + 5 ml of dibazole IV, 5 % pentamine (0.5-1.0 mg) in 20 ml of 40 % glucose IV are slowly administered.

Antiepileptic drags

Active substances	Dosages
Acidum alproicum	500-3000 (1000) mg per day
Carbamazepinum	400-2000 (600-800) mg per day
Phenobarbitalum (benzobarbitalum)	60-240 (120) mg per day
Phenytoinum	100-700 (300) mg per day
Lamotriginum	100-800 (200-400) mg per day
Topiramatum	100-1000 (200-400) mg per day
Clonazepamum	2-8 (2-4) mg per day
Gabapentinum	1200-4800 (2400) mg per day
Pregabalinum	150-600 (300-450) mg per day
Leetiracetamum	1000-4000 (2000-3000) mg per day
Oxcarbazepinum	300-2400 (900-1200) mg per day
Lacosamidum	100-400 (200-300) mg per day

The epileptic status should be controlled, if possible, under in-patient conditions. At first, Diazepam (Sibazon, Lorazepam) is administered IV slowly by 10-20 mg of 0.5 % solution in 20 ml of 40 % glucose. If there is no effect, the administration of Diazepam is repeated 1.5-2 hours later. If the status is not controlled, a slow IV infusion of 40 ml of 2.5 % solution hexenal or sodium thiopental is made (1 g is diluted in 40 ml of NaCl isotonic solution) at a rate of 1 ml per 10 kg of the patient's body weight. Simultaneously, 5 ml of 10 % solution of sodium thiopental or hexenal are injected IM.

Simultaneously with antispasmodic drugs, a lytic mixture is administered: 2 % trimeperidine hydrochloride – 1 ml, 25 % analginum – 2 ml, 1 % diphenylhydramine hydrochloride – 2 ml, 0.5 % novocaine – 2 ml IM.

With the purpose of dehydration, the following drug preparations are administered: 2 % furosemid (Lasix) – 2 ml IM; mannitol with urea by 0.5 g/kg of the patient's body weight in 140 ml of 10 % glucose IV by drops at a rate of 40 drops per minute; ethacrynic acid (Uregit) – 50 mg IV; prednisolone – 1-2 ml IM; Contrical or Trasylol by 10,000-30,000 units in 500 ml of NaCl isotonic solution IV by drops during 4 hours.

With therapeutic and diagnostic purposes, a spinal puncture is made. In order to improve the cardiac activity, 1 ml of 0.06 % corglycon or 0.5-1.0 ml of 0.025 % digoxin IV are slowly administered.

If blood pressure increases, papaverine by 1-2 mg/kg of the body weight, 25 % magnesium sulphate by 10 mg IV + 5 ml of dibazole IV, 5 % pentamine (0.5-1.0 mg) in 20 ml of 40 % glucose IV are slowly administered.

Drags for treatment of mental disorders in patients with epilepsy

Active substances	Dosages
Neuroleptics	
Olanzapinum*	5-25 mg per day
Risperidonum*	0,5-6 mg per day
Quetiapinum*	500-600 mg per day
Amisulpridum*	50-800 mg per day
Antidepressants	
Sertralinum*	25-100 mg per day
Citalopramum*	10-40 mg per day
Paroxetinum*	10-30 mg per day
Escitalopramum*	5-20 mg per day
Venlafaxinum*	75-225 mg per day
Hypnotic drags	
Zopiclonum	3,75-15 mg per day
Zolpidemum	5-10 mg per day
Zaleplonum	5-10 mg per day

LIST OF QUESTIONS FOR PREPARATION OF STUDENTS FOR FINAL MODULAR CONTROL

1. Idiopathic (genuine), symptomatic and cryptogenic epilepsy.
2. The clinical characteristics of an epileptic seizure.
3. The classification of paroxysmal and nonparoxysmal signs of the disease. A generalized tonic-clonic seizure (grand mal).
4. Personality changes in patients with epilepsy.
5. The epileptic status and urgent therapy.
6. The seizures equivalents and epileptic psychoses.
7. The principles of treatment of epilepsy.

Навчальне видання

Епілепсія, епілептичні пароксизми, психічні порушення, лікування

Методичні вказівки для підготовки студентів до практичних занять
(на англійській мові)

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