Psychopharmacology

At mental diseases a significant polymorphism and instability of the basic molecular processes are found out. Substantial evidence on biochemical changes is gathered. There are their various interpretations.

Psychotropic Agents

These are agents influencing mental functions and changing the system of neuromediators, transmitting nervous impulses from the ending of one neuron to another through synapse. To similar mediators noradrenaline, dopamine (D), serotonin, acetylholine, gamma-aminobutyric acid (GABA), histamine, opioid peptide (endorphins, dinorphins, encefalines), prostaglandins refer.

The axiom is that the clinical action of psychotropic drugs is a result of influence on biochemical and electric processes in the central nervous system (CNS). However psychotropic substances not only change systems of neuromediators, but also affect certain biochemical processes connected with enzymes, receptors, ionic tubules, systems of neurotransmitters and messengers. They participate in mechanisms of release, active back capture; they contact various subtypes of pre- and postsynaptic receptors or their components.

Neuroleptics

The name is connected with the development of neurolepsy owing to taking preparations of the given group. On the whole the concept «a neuroleptic agent» refers to preparations, which have an expressed antipsychotic action and are capable of causing extrapyramidal side-effects.

Preparations of a new line do not cause neurolepsy and are called antipsychotics: Closapine, Risperidone, Olanzepine, etc. Two kinds of antipsychotics are distinguished: typical, causing side-effects, and atypical, not having side-effects.

Some Neuroleptics

Aminazinum (Chlorazin, Chlorpromazine, Fenactil, Propa-phenin, Thorazine). One of the main features of its action is a strong sedative effect on a background of antipsychotic action and influence on emotional sphere. Non-

selective effect on dopamine receptors in the hypothalamus area and reticular formation of the brain is expressed. It affects the central mechanisms of thermoregulation.

The alpha-adrenoblocking effect — hypotension, atropine-like, holinolytic, antihistamine, ganglion-blocking effect are expressed.

Pharmacokinetics: the halflife period is 25 hours. The effect on behavioural reactions of patients is kept up to 4 weeks after cancellation, within several months its metabolites, which may render some influence, are excreted by liver. It intensifies the action of soporific, narcotic, analgetic drugs.

In psychiatric practice it is applied for control of psychomotor excitement, productive semiology in patients with schizophrenia, at chronic paranoid conditions, manic excitation of patients with bipolar diseases, other mental diseases accompanied by excitation, fear.

At application of the preparation extrapyramidal diseases, aka-thisia can develop. At long intake the following is possible: increase of body weight, disturbance of sleep, general weakness, depressive disorders.

The initial dose is 0.025-0. 075 g/day; average dose - 0.3 - 0.9g; maximum dose orally — 1.5 g, intramuscularly — 1.0 g, a single dose intravenously — O.lg, 0.25 g/day.

Thioridazine (Sonapax, Melleril, Thioridasine hydrochloride) by an antipsychotic effect concedes only to Aminazinum. But the antipsychotic action is combined with a calming effect without expressed block, slackness and emotional dispassionateness. It has a moderately stimulating effect. A moderate antidepressive effect is marked. It is most effective at mental and behavioural disorders accompanied by stress, excitation, fear.

Indications: schizophrenia, organic psychoses, bipolar disorders. Doses: minimal 0.05-0.1 g/day, average 0.15-0.6 g/day, for children 0.01-0.04 g/day.

Trifluoperazine (Aquil, Triftazinum, Stelazine, Triphtazine and Trasine) is an effective antipsychotic preparation. A neuroleptic effect is combined with a moderate stimulating effect. A sedative action is manifested at increase of dose.

Triphtazine produces a more expressed effect on a productive antipsychotic semiology (delirium, hallucinations) than aminazinum. It is indicated for treatment of schizophrenia, especially paranoid one, other mental diseases proceeding with psychotic semiology and hallucinations, involution psychoses, disorders of a neurotic level.

The dose depends on a way of introduction. Doses are the following: the initial one is 1-5 mg for one intake, average — 30-80 mg/ day orally and 2-8 mg parenterally.

Fluphenazine (Moditen, Dapotum, Lyogen, Moditen, Mirenil). In neurochemical effect a non-selective blocking action of the central dopamine receptors prevails at moderate influence on noradrenergic receptors. It produces a strong antipsychotic effect in combination with insignificant activating effect. A sedative action is expressed moderately and observed at increase of the preparation dose. It is applied at various forms of schizophrenia, especially malignant nuclear ones: hebephrenic, catatonic, paranoid. It is effective at schizophrenia with a long course. In small doses it may be applied at neurotic conditions.

Side-effects: extrapyramidal symptoms are frequently observed, convulsive reactions, allergic phenomena can develop.

Forms of production: tablets (1,2.5 and 5 mg), for parenteral use (a 0.25 % solution) and deposited oil forms (phtorfenazine-dekanoat, moditen-depot — 25 mg in solution).

Clozapine (Leponex, Azaleptinum, Irox) is the first clinically effective preparation with atypical properties. It has an expressed antipsychotic action in combination with a sedative effect. It does not cause general depression of mental activity. It is mainly bound to Dl-receptors. It acts selectively on cortical and mesolimbic systems of dopamine neurons. The non-specific antagonist of 5-HT2-receptors does not cause extrapyramidal reactions, more widely influences other neurotransmitter systems — of noradrenalin and acetylholin.

It is effective in active and supporting therapy of hallucination, delusion, hebephrenic, catatonic conditions, conditions of psychomotor excitation at schizophrenia, within the framework of bipolar diseases, disorders of personality

with conditions of excitation, at affective strain with disturbance of sleep of various genesis. It is a preparation of choice at resistance to treatment by other neuroleptics.

The most serious adverse action is agranulocytosis and convulsive attacks at high dosages (500-600 mg), at taking in the preparation the medicinal monitoring is necessary.

The basic indications for use: the previous unsuccessful attempts of treatment by minimum 3 preparations; the duration of these attempts is more than 6 weeks; use of dosages over or equivalent to 1,000 mg of Aminazinum.

The initial dose of the preparation should make up 25-50 mg/ day with a gradual increase, a therapeutic dose — 300-500 mg/ day, the maximal dose — 900 mg/day.

Olanzapine (Ziprexa) — the characteristics of binding are similar to Clozapine. It is a new antipsychotic preparation of a selective action, without acute extrapyramidal actions in doses up to 20 mg per day. As Clozapine it binds 5-HT- and D2-receptors.

It effectively affects negative semiology and depressions, controls semiology of a psychotic level. Statistically it is considerably better than haloperidol for treatment of patients with schizoaffective disorders.

The basic adverse effects: sedation, hypotension, convulsive attacks.

The minimal dose is 5 mg/day, average dose — 10-20 mg/day, maximal dose — 50 mg/day.

Clopixol (Zuclopenthixol) is an antipsychotic with a specific inhibiting action and nonspecific sedative effect in 2 hours after intake. It is a relatively selective antagonist of dopamine Dl- and D2-receptors.

Indications: schizophrenia, chronic psychoses with delusion and hallucinations, agitation, anxiety, aggression, animosity, mental retardation in combination with psychomotor excitation, senile dementias with paranoid semiology, disturbances of behaviour.

Forms of production — tablets of 2, 10, 25 mg, an average dose — 20-75 mg per day, or 20-60 mg per day during an acute phase of disease and 30-40 mg for

supporting treatment. Deposited: Clopix-ol-acufas for treatment of an acute attack (the initial dose is 50-200 mg depending on severity of condition), Clopixol-depot for supporting therapy of the excited patients (150-300 mg i. m. every 2-4 weeks) and Fluanxol-depot for not excited patients (20-40 mg i. m. every 2-4 weeks).

Haloperidole (Haldol, Halidor, Senorm, Trancodol) is one of the most active neuroleptics. It expressively blocks central dopaminergic receptors, less expressively — central alpha-noradrenergic receptors. It does not produce any central and peripheral anticholinergic action. It frequently causes extrapyramidal effects.

This preparation is effective in treatment of psychomotor excitation of various genesis, productive psychotic symptoms, especially of hallucinations. The effect depends on a dose of preparation: from sedative in small doses up to activating and profound antipsychotic effects. In small doses it is used at neurotic and reactive conditions, senile psychoses, tic disorders.

The minimal dose is 0.3-1.5 mg/ day, an average dose — 15-40-60 mg/day depending on features of the disease.

The most essential complications are: extrapyramidal disorders in the form of parkinsonism, akathisia, dystonia. At the beginning of treatment the attacks of psychomotor excitation and convulsive contractions of various groups of muscles may be observed. There may be the phenomena of alarm and fear; sleeplessness is possible. The preparation is contraindicated at diseases of CNS with pyramidal and extrapyramidal semiology.

Trisedyl (Trifluperidol, Triperidol) is a strong non-selective antipsychotic neuroleptic with a strong action. It has an expressed cataleptic effect. It reduces hallucinatory and delusional excitation very quickly. By the ability to control manic excitation it surpasses other neuroleptics.

It is applied at psychoses accompanied by psychomotor excitation, especially for controlling catatonic and hebephrenic excitation, at prolonged attacks of periodic schizophrenia, at states accompanied by a severe depression and delirium. It is

administered orally (a daily dose is 2-8 mg) and intramuscularly at chronic diseases with 1.25-5 mg, then gradually injections are replaced by intake.

Complications and contraindications are basically the same as at Haloperidol application.

Pimozide (Antalon, Norofen, Orap, Pirium) by spectrum of its action is close to Haloperidol and produces an expressed antipsychotic effect. The peculiarity of the preparation is a rather long effect at oral reception. The effect begins quickly; the maximal effect usually develops in 2 hours, lasts about 6 hours and finishes in 24 hours.

It is applied in out-patient setting as a supporting therapy for schizophrenia, paranoid conditions, psychotic and neurotic disorders with paranoid symptoms. It does not produce a psychomotor-seda-tive effect. An average dose is 5-8 mg/ day.

Fluspirilene (Redeptin) is an active non-selective neuroleptic with an expressed antipsychotic effect without expressed sedative action. By spectrum of pharmacological action it is close to Haloperidol. It is effective at hallucination, paranoid disorders, autism. The basic feature of the preparation is a prolonged action. After a single intramuscular injection the effect proceeds about 7 days.

It is applied as a supporting therapy for patients suffering from chronic mental diseases. It is convenient for out-patient intake. It facilitates readaptation and rehabilitation of patients.

An average dose is 2-10 mg once a week.

At application of this preparation extrapyramidal disorders may develop. At long intake the decrease of body weight, general weakness, disturbance of sleep, depression are possible.

Sulpiride (Abilit, Dogmatil, Eglonil, Nivelan, Omperan, Su-prium, Vipral) is characterized as a preparation with a «regulating» effect on the central nervous system. The psychotropic properties include an antipsychotic, analeptic, somnolent, tranquilizing and stimulating effect. It is a specific dopamine D2-antagonist.

It is applied for controlling anxious, anxious-depressive, obsessive-compulsive, neurotic disorders, mental diseases accompanied by flaccidity, inertness, anergy and adynamia. As an activating means it is used at apathy symptoms.

It is usually well tolerated. Pyramidal disorders, excitation, disturbance of sleep, increase of arterial blood pressure, disturbance of hormonal regulation may be observed. It inhibits motor activity of the stomach and opens the pylorus. It produces an expressed antivomiting effect.

The dosage is 100-1,000 mg/day.

Group of modern atypical antipsychotics

Resperidone (Rispolept). It has a selective sensitivity to sero tonin 5-HT2- and dopamine D2-receptors. It allows to use the preparation for controlling not only negative, but also positive symptomatology.

Other indications: tic diseases, mental retardation, disorders of development, mental disorders due to somatic diseases, AIDS, conditions of excitation and aggression at dementias, nervous anorexia, obsessive-compulsive disorders, posttraumatic stressful disorders.

Side-effects at average doses — lactorrhea, oligomenorrhea, hypotension, increase of interval Q-T on ECG.

The effect may start at administration of small doses — 1-4 mg/ day, average doses — 4-8 mg/ day.

Side-effects

The majority of patients tolerate neuroleptic side-effects of a mild degree as dryness in the mouth or tremor. The complications of therapy by antipsychotics do not exceed other kinds of medicinal therapy in severity of complications. The non-specific sedative effect is the decrease of the preparation dose up to optimal. To other side-effects the following refers: hypotension, difficulty of ejaculation, extrapyramidal effects, cardiotoxic action (lengthening of interval Q-T on ECG, arrhythmia, tachycardia, dryness in the mouth, aggravation of glaucoma, retention of urination, constipations and intestinal obstruction; hepatotoxic effect;

leucopoenia, allergic skin reactions. The somatic complications occur more often in elderly and weakened patients.

Malignant Neuroleptic Syndrome

It is characterized by muscular rigidity, dystonia, akinesia, mutism, devocalization, agitation. Vegetative symptoms are the increase of temperature up to 41 °C, hyperhidrosis, tachycardia, increase of arterial blood pressure. The toxic rash, increase of permeability of vascular walls, hepatic insufficiency are observed. The probability of lethal outcome is high at the development of neuroleptic syndrome.

Treatment: an immediate cancellation of neuroleptics; cooling of the patient; maintenance of water-electrolytic balance and other vital functions; symptomatic treatment of hypothermia; antiparkinsonic drugs; muscle relaxants; Bromocriptine or Amantadine; big doses of nootropics; hyperbaric oxygenation; hemodialysis, extracorporal he-rnosorption and plasmapheresis.

Tranquilizers

Tranquilizers are sedatives not changing consciousness. The majority of tranquilizers produce an anxiolytic (eliminating alarm) effect, reduce nervous tension, not influencing other functions of the brain.

Tranquilizers are presented mainly by a group of benzodiazepines, having a somnolent, sedative, anxiolytic, antiepileptic and central muscle-relaxing effect. Benzodiazepines differ from each other in effectiveness, rate of inactivation and excretion from organism.

Alprozalam (Xanax). The basic indications: depressive, neurotic conditions with disturbance of mood, loss of interest in environment, anxiety, disturbance of sleep, depression on a background of somatic disease.

Average doses — 0.5-1 mg/day.

Diazepam (Sibazon, Seduxen, Relanium, Valium) has an expressed spasmolitic, antiepileptic, myorelaxing (neuromuscular) effect. The effect on vegetative symptoms is specific. It is a preparation of choice at rendering urgent help. It is rather slowly excreted.

Side-effects: weakness, flaccidity, sleepiness in the daytime, headaches and dizziness, allergic skin reactions, ataxia, decrease of libido, paradoxical reactions as increase of alarm, excitation, disturbances of sleep.

Average doses — 5-40 mg/day.

Chlorazepat (Chlorazepam, Tranxene) is a preparation of a benzodiazepine group with a long action. It has an expressed anxiolytic effect, a sedative, somnolent, antiepileptic and central muscle-relaxing action. Indications: the phenomena of alarm, tic disorders, depressive-anxious conditions, alcohol delirium.

Side-effects and contraindications are common for all benzodiazepines.

Average doses — 5-15 mg.

Triazolam has an expressed hypnotic effect. It suppresses the CNS at the level of visceral brain and subcortical areas. It potentiates the action of drugs, alcohol, antihistamine drugs, barbiturates and antidepressants.

It is indicated to patients with insomnia. It does not disturb the rate of motor and mental reactions next day.

The recommended dose is 0.25 mg before bedtime.

Midazolam (Dormicum) is a quickly acting and quickly excreted hypnotic. It has an anxiolytic, antiepileptic, relaxing effect. Accumulation is not observed. It shortens the phase of falling asleep and increases the time of sleep without changing phases of sleep.

Indications: disturbance of sleep, especially disturbance of falling asleep and early awakenings.

Average doses — 7.5-15 mg.

Estazolam mainly suppresses the activity of the limbic system and subcortical area of the brain, potentiates the action of GABA, secondarily blocks cortex activity and cortex-limbic links that provides an expressed somnolent effect.

Indications: a short course of treatment of sleeplessness with difficulty of falling asleep, frequent night and morning awakenings.

An average dose is 1-2 mg/day. Nicotine increases metabolism and excretion of the preparation.

Cvazepam is a strong hypnotic of the central action, influences the limbic and thalamic parts of CNS, binding the receptors responsible for sleep processes.

Indications are as above-mentioned. As the previous preparation, it potentiates the action of alcohol, benzodiazepines, opioids, analgetics with suppression of CNS.

Average doses are 7.5-15 mg.

Zolpidem (Ambien). It does not cause a muscular relaxation, does not have any anxiolytic and antiparoxismal action, is quickly absorbed for 2.2 hours and is bound with proteins of plasma.

Side-effects: it may disturb cognitive functions; non-expressed signs of the cancellation syndrome were observed.

Zopiclon (Imovan, Ivadal). In contrast to benzodiazepines it is bound only to the central receptors and has no affinity with peripheral benzodiazepine receptors. It is well absorbed, quickly causes sleep lasting for 6-8 hours with preservation of a normal phase architectonics of sleep. It does not cause tolerance, syndrome of cancellation.

An average dose: 7.5 mg immediately before bedtime.

Melatonin is sometimes effective at seasonal sleeplessnesses in a dose of 0.3 mg/day.

BuSpar is a derivative of Azapirone. It has clinical properties of a tranquilizer and antidepressant. To a greater extent it normalizes neuronal transmission of serotonin.

Spectrum of clinical activity: an antianxious, antiparoxysmal and expressed sedative effect. It does not cause flaccidity, weakness, does not disturb memory, cognitive and psychomotor functions, and does not interact with alcohol. There are no qualities for abusing the preparation; a stimulating effect is not present.

Bromocriptine is a strong dopamine stimulator. It has an anxiolytic and analeptic effect.

Antidepressants

In psychiatry the following antidepressants are most frequently used: non-selective inhibitors of reuptake of serotonin and noradren-alin, monoamine oxidase inhibitor antidepressants, tricyclic antidepressants, tetracyclic antidepressants.

Amitriptyline (Amitril, Amizol, Elavil, Laroxyl, Tryptizol) is a classical tricyclic antidepressant. It is mainly applied at endogenous depressions with alarm and agitation.Average doses — 100-250 mg/day.

Klomipramin (Anafranil, Hydiphen, Neoprex) by pharmacological properties is close to Imipraminum, but differs in a stronger blocking influence on reuptake of serotonin. It has an expressed action on the depressive syndrome with psychomotor inertness, alarm. It produces a specific effect at obsessive-compulsive syndrome and chronic painful syndromes. Its advantage is a faster therapeutic action on depression.

A dose increases gradually within 10 days from 10-30 mg up to 50-75 mg. The maximal dose is 250 mg/day.

Melipraminum (Imipraminum, Imavate, Deprenil, Melipramin, Antipress, Tofranil) is the basic representative of tricyclic antidepressants. Simultaneously it is a nonselective inhibitor of reuptake of dopamine, noradrenalin, serotonin. It has an expressed analeptic effect with a stimulating action.

It is applied at depressions of various aetiology with motor and ideational inertness, flaccidity. The preparation promotes the decrease of melancholy, occurrence of vivacity, increase of a mental and general tone. It is effective at a chronic painful syndrome and night enuresis (beginning with the 5th year of life). It promotes the inversion of phase at bipolar disorders.

It is administered from the dose of 75-100 mg/day with a daily increase by 25 mg. An average dose is 200-300 mg/day.

Mianserin (Lerivon). The structure of activity consists of analeptic and sedative effects. By its effect it refers to «small» antidepressants that allow applying it in general medicine. It reduces alarm, the feeling of internal tension, and disturbances of sleep. According to ability to control alarm and disturbances of

sleep it competes with tranquilizers, but in contrast to the latter it does not cause addiction and dependence.

A therapeutic action has four components, which develop gradually. In the first days of intake a sedative action is manifested, within the first week an antianxious action develops. It is indicated for therapy of a climacteric syndrome, vegetative crises, headaches of tension, syndrome of chronic pains, prevention of migraine. It is acceptable to persons of elderly age.

It is administered beginning with 15 mg/day. A therapeutic range is 30-60 mg for a single intake in the evening.

Fluoxetine (Prozac, Prodep) is a classic inhibitor of serotonin reuptake. It is applied at depressions of a neurotic level, including somatoform and dysthymia disturbances, superficial endogenous depressions with apathy.

Side-effects may include allergic reactions, sexual dysfunction.

It is applied once a day or once every 2-3 days in average doses of 20-40 mg in the morning together with food.

Zoloft is a strong selective inhibitor of serotonin reuptake. It is effective at anxious depressions with disturbance of sleep; at somatic depressions with bulimia and increase of body weight; at obsessive-compulsive disorders.

Among side-effects dryness in the mouth, disturbance of ejaculation in men, tremor and hyperhidrosis are marked.

The therapeutic range is 50-200 mg/day.

Cipramil (Citalopram) in vitro is the «standard of selectivity». Its dose is 20-40 mg per day for one intake.

Remeron (Mirtazapine) is similar to classical antidepressants. Indications for application: depressive, bipolar disorders of different degree of expressiveness; chronic disturbances of mood; somatoform disorders; disturbances of sleep. It is applied at accompanying somatic pathology and at elderly age.

Side-effects: sedation in the daytime, increase of appetite and body weight, transient neuropenia, hypogranulocytosis.

The therapeutic range is 15-60 mg/day for a single intake in the evening.

Nialamidum (Nuredal, Espril, Nyazin) refers to monoamine oxidase inhibitor antidepressants.

Side-effects: dyspeptic symptoms, decrease of systolic pressure, sleeplessness, headache, dryness in the mouth, retention of stool, etc.

At administration of Nialamidum it is necessary to take into account the opportunity of development of side-effects connected with inhibition of MAO. It is impossible to administer TCA, other IMAO simultaneously with Nialamidum; a 2-3-week interval before administration of other antidepressants is necessary. To avoid tyramine syndrome during treatment with Nialamidum it is necessary to exclude from a diet the foodstuffs containing tyramine and other vasoconstrictive monoamines, including cream, coffee, beer, cheese, wine, smoked products.

Average doses: 200-400 mg/day in 2 intakes (in the morning and in the afternoon) for the prevention of disturbance of night sleep. A therapeutic effect begins in 7-14 days. The duration of treatment is individual — from 1 up to 6 months.

Normothymics

To normothymics the salts of lithium, preparations of an Iminostilben group (Carbamazepine) and salts of Valproic acid refer.

Preparations of lithium have the ability to control acute manic excitation and prevent affective attacks.

Lithium carbonate (Contemnol, Lithosun, Quilonium, Lithii carbonas, Plenur, Neurolepsin). Lithium is a stabilizer of cellular membranes. Ions of lithium influence transport of sodium ions in the nervous and muscular cells. The basic indications: manic and hypomanic conditions of various genesis, prevention and treatment of affective psychoses, disorders of personality with affective fluctuations, affective disturbances in patients suffering from alcoholism.

The concentration of lithium in blood plasma amounting to 0.9-1.2 mmol/1 is of therapeutic importance.

Side-effects: tremor, ataxia, general malaise, drowsiness, thirst, dyspeptic phenomena, diarrhoea, disturbance of the heart rhythm, dermatites, disturbance of function of the kidneys, liver, etc.

Usual dosages — 1.5-2.1 g/day.

Carbamazepine (Carbamazepine, Finlepsin, Carbapin, Timonil, Tegretol, Zeptol, Epitol, Novocarbamaz).

Preparations of this group are synthesized from Imipramine (antidepressant). The basic indications: various kinds of epilepsy, including temporal epilepsy, diencephalic epilepsy, depressions with rhythm, manias with dysphorias, trigeminies, vegetative dysfunctions, affective disorders, alcoholism, abstinent syndromes, disturbance of sleep.

Preparations of this group are produced in tablets of 200 mg. Retard forms of 200 and 400 mg are available.

Average doses are 600-1,200 mg/day. An analgetic and vegeto-stabilizing effect occurs at low dosages of 100-200 mg/day.

Volproats are stimulators of the central GABA processes.

Valproic acid and its salts (Na, Ca, Magnesian) are a relatively new group of psychotropic means having the expressed antiepileptic activity. Valproats have an antiepileptic effect and are effective at different kinds of epilepsy, especially at small forms.

Acediprolum (Apilepsin, Convulex, Depacene, Depakin, Depa-cote, Divalproex, Encorat, Orfiril, Valpakine, Valproate sodium) is an antiepileptic of a wide range of action.

It is applied at different forms of epilepsy: absences, temporal pseudoabsences; at convulsive (big) and polymorphic, focal (motor, psychomotor) attacks.

Volproats produce not only an antiepileptic effect. They improve mood, mental tonus of patients, have tranquilizing properties with decrease of conditions of fear, but without somnolent, sedative and muscle-relaxing actions.

Side-effects: nausea, vomiting, diarrhoea, pains in the stomach, anorexia, drowsiness, allergic skin reactions. The most serious side-actions are disturbances

of functions of the liver, pancreas, deterioration of blood coagulability, thrombocytopenia.

A daily dose is 0.6-1.5g. One-time dose is 0.3-0.45g.

Recently new GABA preparations have been created.

Vigabatrine is structurally close to GABA; being an irreversible inhibitor of GABA-receptors, it protractedly increases the level of GABA in brain, decreases the level of stimulating amino acids (Glutamate and Aspartate).

Gabapentine is a cyclic compound, close by structure to GABA, penetrating through a hematoencephalic barrier and affecting the central GABA-receptors.

The preparation **Lamotrigine** blocking the central stimulating neuromediator amino acids (Glutamate and Aspartate) is of interest. At present it is applied basically for treatment of partial and generalized epileptic attacks, and when other antiepileptic means are ineffective.

Nootropics

Nootropics are a wide circle of medicines, which main features are the improvement of cognitive functions and decrease of sensitivity of brain to damaging factors.

The mechanism of nootropic action is connected with activation of synthesis of phospholipids, stabilization of a cellular membrane, interaction with various neuromediator systems, mainly with GABA.

The basic preparations of this group are Pyracetam and its analogues (Nootropil, Pyramem). To the same group Pyritolum (Pyriditolum, Cerebol, Cogitan, Encephabol Pyritinol), Acephenum (Meclofenoxate hydrochloride) refer, as well as some preparations structurally connected with gamma-aminobutiric acid (GABA) — Aminalonum (CABA, Gammalon), Picamilonum, Natrii oxybutyricum, Pantogamum (Calcium homopantothenat, Nopate), Phenibutum; preparations of amino acid line — Cogitum; hormonal preparations deprived of hormonal activity — Semax.