CHARACTERISTICS OF SLEEPING DRUGS OF DRUG TYPE

Turgunov Ma`murjon Abdulazizovich

Head teacher of the Department of Pharmaceutical Sciences ASMI

Annotation: *This article discusses the properties of narcotics, epilepsy, the positive and negative effects of antiepileptic drugs used in general seizures.*

Keywords: *Sleeping pills, pentobarbital, antiepileptic drugs, epilepsy, phenobarbital*

Аннотация: *В статье рассматриваются свойства наркотиков, эпилепсии, положительные и отрицательные эффекты противоэпилептических препаратов, применяемых при общих припадках.*

Ключевые слова: *снотворное, пентобарбитал, противоэпилептические препараты, эпилепсия, фенобарбитал.*

Derivatives of barbituric acid belong to the group of sleeping pills that have a narcotic effect:

• pentobarbital

• cyclobarbital

• phenobarbital

• includes chloral hydrate.

In large doses, these substances can cause drug effects. Barbiturates are highly effective sleep-inducing agents; helps to induce sleep, prevents frequent awakenings, increases the overall duration of sleep.

Their sleep-inducing mechanism is due to the increased inhibitory effect of GABA. Barbiturates increase the sensitivity of GAMKA receptors, thereby activating C1-channels and causing hyperpolarization of the neuronal membrane.

In addition, barbiturates have a direct effect on neuronal membrane permeability.

Barbiturates significantly disrupt the sleep cycle: they shorten fast (paradoxical) sleep cycles (REM-phases).

Regular use of barbiturates can lead to impaired MNS function. Abrupt cessation of regular barbiturates is manifested in the form of "withdrawal" syndrome ("withdrawal" syndrome), in which the duration of REM sleep is greatly increased, which leads to nightmares. Regular use of barbiturates leads to physical dependence.

Pentobarbital (sodium-etaminal, nembutal) is taken orally 30 minutes before bedtime; The duration of action is 6-8 hours. He may feel drowsy when he wakes up.

Cyclobarbital has a short duration of action - about 4 hours, and the effect is less noticeable. It is mainly used in sleep disorders.

Phenobarbital (luminal) has a slower and longer duration of action - about 8 hours; has a significant complication (drowsiness). It is now rarely used as a sleeping pill. The drug is used in the treatment of epilepsy. Acute barbiturate poisoning is characterized by coma and shortness of breath.

There are no specific antagonists of barbiturates. Analeptics do not restore breathing when severely poisoned with barbiturates, but they do increase the brain's need for oxygen - an increase in oxygen deficiency.

The main measure in case of barbiturate poisoning is the rapid elimination of barbiturates from the body.

The best method is hemosorption. In case of dialysis poisoning, hemodialysis is used, and in case of poisoning by drugs excreted by the kidneys, forced diuresis is used. Sleeping pills that contain narcotics include chloral hydrate from aliphatic compounds.

It does not disrupt the sleep phase, but is rarely used as a sedative because it has stimulant properties. Chloral hydrate is sometimes used in medical enemas to stop psychomotor agitation.

Antiepileptic drugs.

Epilepsy is a chronic disease of the central nervous system that occurs with recurrent seizures, with or without seizures, with or without loss of consciousness. There are partial (focal, focal, local) and general types of seizures.

Partial seizures are associated with the development of individual excitatory foci in the motor or sensory-motor areas of the cerebral cortex. Partial seizures are characterized by short-term (30-60 s) muscle contractions with limited localization that occur without loss of consciousness (normal partial seizures) or with loss of consciousness (complex partial seizures).

In general seizures, the excitation covers both hemispheres of the brain and is reflected on the EEG with high amplitude. Common seizures can be tonic-clonic, abscess, or myoclonic.

Tonic-clonic seizures (large seizures, grand mal) are characterized by general (all-body) seizures that occur in the form of fainting. It includes the tonic phase (falling with muscle tension) and the clonic phase (pulling of the limbs). The seizure usually lasts a few minutes, may be followed by shortness of breath, involuntary urination, and a transition to deep sleep.

Abscesses (small seizures; petit mal), characterized by short-term (5–15 s) loss of consciousness, frostbite, without significant convulsions, and then resuming normal behavior.

Myoclonic seizures are characterized by sudden, short-term symmetrical vibrations and tremors in the limbs, which may be accompanied by loss of consciousness.

The most severe form of epilepsy is epileptic status, in which major seizures recur frequently and the patient usually does not regain consciousness; Death due to respiratory failure may occur.

The effects of antiepileptic drugs are to prevent the onset and spread of pathological impulses in the brain. For this purpose, drugs that suppress or inhibit inflammatory processes are used.

Drugs that inhibit Na + -channels (phenytoin, carbamazepine), Ca2 + -channels (ethosuximide) and reduce the release of excitatory amino acids (lamotrigine) are used to suppress excitatory processes.

In order to activate the inhibitory processes are used substances that inhibit the CNS - enhancing the effect of GABA (phenobarbital, diazepam, clonazepam, gabapentin).

Phenytoin, carbamazepine, valproate, as well as gabapentin, lamotrigine, clonazepam, topiramate are used to prevent partial seizures.

Phenytoin, phenobarbital, carbamazepine, valproate, primidone, and lamotrigine are used to prevent tonic-clonic seizures.

Ethosuximide and valproate are prescribed to prevent abscess.

Valproate, clonazepam, and lamotrigine are used for myoclonic seizures.

Diazepam, phenytoin sodium, and, in severe cases, thiopental sodium are given intravenously to relieve (stop) epileptic status. Phenobarbital (luminal) is one of the antiepileptic drugs. Regular use in moderate doses prevents major seizures without sleep-inducing effects. The mechanism of action of phenobarbital is associated with an increase in the effect of GABA (increases the sensitivity of GAMKA receptors) and a direct inhibitory effect on the permeability of cell membranes. Side effects of phenobarbital: sedative, drowsiness, nystagmus, ataxia, skin rash. Primidone (hexamidine) is slightly different in chemical structure from phenobarbital. Has a slight sedative effect.

Phenytoin (diphenine) is effective (but not in absentia) in partial and tonic-clonic seizures. Phenytoin is usually given orally to prevent seizures. In epileptic status, phenytoin sodium is injected intravenously. The mechanism of action of phenytoin is due to its inhibition of Na + -channels (phenytoin slows down the recovery of Na + -channels after inactivation).

In this case, the depolarization process is disrupted, repetitive pulse propagation is suppressed. It has antiarrhythmic effect due to inhibition of Na + -channels of cardiomyocytes.

Side effects of phenytoin: headache, nausea, nystagmus, diplopia, ataxia, tremors, skin rash, itching, gingival hyperplasia, hirsutism; osteomalacia and megaloblastic anemia may also occur. Phenytoin has teratogenic properties.

Carbamazepine (tegretol, finlepsin) is an Na + channel inhibitor. Partial and tonic-clonic seizures are effective. In addition, carbamazepine is one of the analgesics used in trigeminal neuralgia.

Side effects of carbamazepine: nausea, headache, diplopia, ataxia, anemia, leukopenia (agranulocytosis). A general blood test is necessary when using carbamazepine.

Ethosuximide is a key tool to prevent abscess. Abscesses are associated with activation of T-type Ca2 + channels in the thalamus, a decrease in the action potential limit, and rhythmic charge residues of thalamic neurons. Ethosuximide inhibits T-type Ca2 + channels in the cell membranes of thalamic neurons.

Side effects of ethosuximide: nausea, vomiting, anorexia, drowsiness, headache, photophobia, leukopenia, thrombocytopenia, redness.

Valproic acid (convulsion) or sodium valproate (depakin) blocks Na + -channels and partially T-type Ca2 + -channels; In vitro, they activate glutamate decarboxylase (increased production of GABA from glutamic acid) and inhibit GABA transaminase. Effective in preventing all types of epileptiform seizures.

Side effects: sedative, ataxia, tremors, nausea, stomach pain, liver dysfunction, thrombocytopenia, neutropenia, alopecia. Antiepileptic drugs include gabapentin, lamotrigine, clonazepam. Gabapentin is chemically similar to GABA. Initiates the release of GABA. It is effective in partial seizures. Lamotrigine blocks Na + -channels of the presynaptic membrane at glutamatergic synapses and reduces glutamic acid secretion. Used to prevent partial and tonic-clonic seizures.

Topiramate (topamax) blocks Na + -channels, enhances the effect of GABA. Mainly used in partial seizures.

Clonazepam (antelepsin) is a drug belonging to benzodiazepines (increases the sensitivity of GABA receptors). Used in pediatric epilepsy; in adults it is often used in partial seizures.

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