

THE PHARMACOKINETIC AND PHARMACODINAMIC PRINCIPLES OF RATIONAL USE OF SEDATIVES, HYPNOTICS, ANXIOLITICS, ANTIPSYCHOTICS, NOOTROPS, ANTIDEPRESSANTS AND ANTICONVULSANTS DRUGS

A. Relevance

Psychotropic and hypnotic medication regulates various functions of the CNS, so it is used in the treatment of various diseases and psychopathological conditions. The CNS acting drugs are used to treat specific diseases and, as well, some nonspecific psychopathological diseases and states. The preparations from the respective groups possess a series of pharmacological effects (sedative, anxiolytic, hypnotic, anticonvulsant, analgesic potentiation, etc.) with beneficial action in various dental interventions, in case of treatment of diseases of the oral cavity, oro-maxillo-facial region, and in some emergency states (convulsions, psychomotor excitations, fever, sleep disorders, etc.). Knowledge and proper use of all the properties of drugs that affect the CNS can improve the treatment outcomes of patients with CNS pathologies, including mental illness associated with some diseases of the oral cavity. At the same time, the medicinal preparations in the given groups may be responsible for some adverse reactions, often with serious consequences, which require prompt diagnosis and appropriate treatment.

B. Goal of teaching

Acquiring and applying clinical pharmacokinetics and pharmacodynamics principles to individualize and optimize the administration of drugs with action on the CNS in dental practice, for the rational and harmless premedication in dental practice, as well as treating patients with mental illness associated with some diseases of the oral cavity.

C. Teaching objectives

The student must possess the skills to:

- a) selection of drugs with action on the CNS for different clinical situations, according to the pharmacodynamic and pharmacokinetic particularities;
- b) select the efficient and harmless associations, necessary for the performance of a dental treatment or of the manipulations accompanied by fear, anxiety and pain;
- c) provide emergency assistance in vital pathological conditions;
- d) knows the criteria for assessing the efficacy and safety of the preparations from these groups;
- e) apply contemporary methods of prophylaxis and treatment of adverse reactions caused by drugs with action on the CNS;
- f) development of the personal form (medicines-P).

D. Knowledge of previously studied and related ones

Anatomy and physiology. Principles of CNS and PNS (peripheral nervous system) functioning. Peculiarities of the autonomic and somatic nervous system. Physiology of the cerebral cortex. Processes of excitation and inhibition in the CNS. Anatomic and physiological peculiarities of: neuron, receptors and synapsis. Thalamus. Hypothalamus, limbic system: anatomic and physiological properties. Characterization of the cognitive process. Personality as a result of psychophysiological and social factors. Sleep and sleep structure, involvement of different CNS acting drugs in sleep structure.

Pathophysiology and clinical disciplines. Pathogenesis of CNS and peripheral diseases. Neuroses: general characteristic; the role of biological and social factors in the occurrence of neuroses; clinical manifestations. Somato-neurological and psycho-somatic manifestations in different pathological states. Psychovegetative syndrome. Sleep disorders and treatment principles. Convulsions, epilepsy. Principles of treatment.

Pharmacology. Classifications according to the pharmacotherapeutic and pharmacokinetic principle, mechanisms of action, effects, indications, adverse reactions of drugs with action on the CNS.

E. Questions for Self-Tuition

A. Clinical and pharmacological characteristics of CNS acting drugs

1. Clinical pharmacology of sedatives: classification, pharmacodynamic characteristics (mechanisms and manifestations), pharmacokinetic features, indications and principles of selection and dosing, contraindications, adverse reactions and clinical manifestations, drug interactions, indications, principles of use in dentistry.
2. Clinical pharmacology of trachylizers (anxiolytics): classification according to therapeutic use and duration of action, their effects and clinical manifestations, particularities of the mechanism of action, indications and principles of choice and dosage, contraindications, adverse reactions and their prophylaxis, drug interactions.
3. Clinical pharmacology of hypnotics. Classification according to pharmacodynamic, pharmacotherapeutic criteria and duration of action. Peculiarities of hypnotic effect and side effects, pharmaceutical aspects. Principles of correction of sleep disorders.
4. Clinical pharmacology of antipsychotics (neuroleptics): classification according to clinical effect, pharmacodynamics (mechanisms and manifestations), pharmacokinetic particularities, indications and principles of selection and dosage, contraindications, adverse reactions and clinical manifestations, drug interactions.
5. Clinical pharmacology of antidepressants: classification according to clinical use, mechanism of action, clinical effects and manifestations, indications and principles of use and dosage, pharmacokinetics, adverse reactions, interactions with other drugs. Peculiarities of antidepressant use in the elderly.
6. Clinical pharmacology of symptomatic anticonvulsants: classification by group appearance and influence on the respiratory center, peculiarities of the anticonvulsant effect. Principles of selection and use of anticonvulsants in the group of benzodiazepines, barbiturates, GABA and aliphatic derivatives, magnesium. Pharmacokinetic features, adverse reactions, drug interactions.
7. Clinical pharmacology of antiepileptic drugs. Pharmacotherapy of epileptic seizures (epileptic seizures).
8. Clinical pharmacology of nootropics: classification, particularities of the mechanism of action, effects and clinical manifestations, indications and aspects of clinical use, dosing principles, adverse reactions, drug interactions.
9. Peculiarities of the administration of CNS acting drugs during pregnancy and lactation, as well as the pharmacokinetic, pharmacodynamic and pharmacogenetic principles in the individualization and optimization of drugs administration for children and elderly persons.

B. Clinical and pharmacological selection and use of drugs in some clinical states and diseases:

Principles of selection and use of antipsychotic drugs in the treatment of somatic diseases, including dental practice.

Principles of selection and use of sedative, tranquilizer and hypnotic preparations in case of fear and anxiety before dental interventions and sleep disorders.

Principles of selection and use of anticonvulsant drugs in convulsions of various causes, as well as the treatment of epileptic seizures and status epilepticus.

F. Individual work

1. Brief characterization of the main preparations

Vertically. International Non-Proprietary Name (INN) of the drug (in the Romania language).

Horizontally. Synonyms, forms of delivery, way of intake, doses (therapeutic, maximum doses), mechanisms of action, prescriptions, contraindications, adverse reactions:

Thioridazine, chlorprotixen, levothyracetam, pregabalin, pramipexole, escitalopram, melatonin.

2. Exercises on medical formulation (see methodological instructions for practical works on pharmacology): Midazolam, phenobarbital, diazepam, nitrazepam, fenazepam, oxazepam, flunitrazepam, temazepam, clonazepam, lorazepam, alprazolam, pimozide, tofizopam, chlordiazepoxide, doxylamine, flumazenil, chlorpromazine, levomepromazine, droperidol, haloperidol, clozapine, sulpiride, lithium carbonate, amitriptyline, phenytoin, sodium valproate, carbamazepine, gabapentin, valerian tincture, zopiclone.

3. Indicate the preparations used in (for): psychomotor excitation in psychiatric diseases; psychomotor excitation in alcohol withdrawal syndrome; fear of dental interventions, anxiety, vomiting of central origin; vegetoneurosis in neuro-circulatory dystonias; neurosis; pre-anesthetic and preoperative preparation; preparation for manipulations and diagnostic procedures; seizures of unknown causes; epilepsy; potentiation of analgesia; agitated depression; astheno-depressive states; psychic overwork; transient hyposomnia; short-term hyposomnia; chronic hyposomnia.

4. Tests (Clinical Pharmacology, self-assessment tests, Chisinau - 2000, page 37.

5. Clinical Pharmacology (Тесты для самоподготовки), Chisinau - 2014., st. 20.

6. Virtual situations (movies). Guide for laboratory works in pharmacology Chișiău - 2016, page 124, 130,140.

7. Selection of P-personal medicines and P-personal treatment according to the criteria of efficacy, harmlessness, acceptability and cost for inclusion in the personal form (P medicines).