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Modern Methods of Epilepsy Treatment and Prevention of Tactical and Therapeutic Errors in Epilepsy Treatment

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Abstract: Even a single epileptic seizure can be a traumatically dangerous and psychotraumatic event with great social consequences (loss of ability to drive, restrictions regarding employment, etc.). Repeated epileptic seizures lead to even more serious problems. Therefore, it is important to rely on evidence-based guidelines for diagnosis and management of patients after a first epileptic seizure and, if necessary, to prevent recurrent epileptic seizures with antiepileptic drugs. Timely prescription of antiepileptic therapy and choice of drug is extremely important, because successful initial treatment of epilepsy is the key to further success, increasing patients' adherence to therapy, preventing the development of certain psychiatric symptoms in them.

Keywords: epilepsy, epileptic seizures, antiepileptic drugs.

Introduction. Antiepileptic (anticonvulsant) drugs are drugs that reduce the excitability of neurons of the brain and do not allow the seizure to develop. They do not eliminate the cause of the illness, but control its manifestations, so that the person can lead a full life. Taking antiepileptic drugs (PEP) is the main and most effective method of treating epilepsy in adults and children. However, to achieve results, it is important that the doctor choose the right drugs and their dosage. In half of all patients who benefit from drug therapy, seizures can be controlled with the first correctly prescribed medication (monotherapy). Another 30% get rid of seizures by increasing the dosage of the same medication. And only 20 patients out of 100 need polytherapy epilepsy - a combination of several drugs.

On the other hand, for a number of patients, treatment is not advisable. In each case, it is necessary to make a weighted decision, taking into account the frequency and severity of seizures, risks and limitations associated with epilepsy, side effects of drugs and their teratogenicity. Be sure to treat frequent seizures, seizures with loss of consciousness or control and risk of injury, socially unacceptable seizures, and prolonged seizures. It is recommended that seizures that occur very rarely, simple focal seizures without loss of control, seizures that occur only in sleep, and that reproductive plans be considered when prescribing treatment. In all cases, the patient should be involved in the decision-making process.

Antiepileptic therapy is generally recommended after a second epileptic seizure. Given the high risk of recurrent epileptic seizures, antiepileptic therapy should be administered after the first unprovoked epileptic seizure if:

- ✓ the patient has a neurologic deficit;
- ✓ there is unequivocal epileptic activity on the EEG;
- ✓ the risk of a possible recurrent epileptic seizure is unacceptable, and the benefits of treatment exceed the risks and possible harms, after assessing the social, emotional, and personal consequences of epileptic seizure recurrence and treatment itself;
- ✓ using neuroimaging techniques, a structural disorder of the brain is detected;

- ✓ debut from epileptic status.

In general, the risk of seizure recurrence is higher during the first 2 years (21-45%), especially the first 12 months and minimal 2 years after the first unprovoked epileptic seizure. When deciding on the initiation of antiepileptic treatment, it should be remembered that treatment should be prolonged, continuous, the patient and his/her relatives should understand the need for such therapy and adhere to it. Therefore, the question of initiating anticonvulsant therapy should have not only a medical but also a socio-economic background. Only if all factors are taken into account will a patient with epilepsy be committed to treatment, which is essential for a successful outcome.

The patient and relatives should receive the following information regarding:

- ➢ epileptic seizures and epilepsy in general;
- ➢ diagnostic-treatment options;
- ➢ anticonvulsants and their side effects;
- ➢ the type of epileptic seizure, its triggers (provocateurs);
- ➢ issues of safety, first aid, and injury prevention at home, at work, and in public places;
- ➢ the question of insurance;
- ➢ the possibility of performing certain activities (exclude work that requires attention, or may be dangerous);
- ➢ safety of driving and driving on the roads;
- ➢ prognosis;
- ➢ risk of epileptic status, sudden death in epilepsy (SUDEP);
- ➢ lifestyle, recreational, and social issues (including drug use, alcohol use, sexual activity, sleep deprivation, etc.);
- ➢ pregnancy planning.

Therapy should be individualized according to the type of epileptic seizure, taking into account concomitant pathology, and the medications the patient is already taking. It is recommended to start with monotherapy (use of a single drug). If the anticonvulsant is accompanied by unacceptable side effects, or the therapy is ineffective despite the therapeutic dose and the patient's adherence, another anticonvulsant is chosen for monotherapy. If monotherapy is ineffective (after 2-3 attempts), combination therapy is chosen. If seizures continue despite the optimal dose of anticonvulsant, at each stage of treatment modification, the correctness of the diagnosis and the patient's compliance with the recommended treatment should be reviewed.

Blood concentrations of anticonvulsant may be monitored for clinical indications in the following cases:

- ✓ suspicion that the patient is not adhering to the schedule and/or dosage of the drug;
- ✓ suspicion of anticonvulsant toxicity;
- ✓ correction of the anticonvulsant dose;
- ✓ observation of pharmacokinetic interactions (e.g., changes in bioavailability, elimination, or interactions with other drugs);
- ✓ specific clinical indications, e.g., epileptic status, organ failure, certain conditions during pregnancy (e.g., increased frequency of epileptic seizures during pregnancy).

If the patient has had no epileptic seizures for at least 2 years, withdrawal of the anticonvulsant may be considered. The decision to extend treatment or discontinue the medication is made by the patient and the patient's relatives or caregivers and the physician after discussing the risks and benefits of discontinuing the medication. The characteristics of the epileptic syndrome, concomitant pathology

(e.g., structural changes in the brain), and lifestyle should be considered to assess the likelihood of recovery of epileptic seizures. Withdrawal of an anticonvulsant should be done under the supervision of a physician. The process of dose reduction is carried out slowly (at least 2-3 months).

Table 1. Major antiepileptic drugs

Name	Time to reach equilibrium, days	Number of servings per day	Initial dose, mg/day	Maintenance dose, mg/day
Valproic acid (depa-kin, convulx)	2-4	2-3	300-600	600-2000
Gabapentin (neurontin)	1-2	4	300	1200-4800
Carbamazepine (finglepsin, tegretol)	3-10	2-3	200	400-1600
Lamotrigine (Lamictal)	5-10	1-2	25	150-400
Levetiracetam (keppra)	2-3	2	500-1000	1000-3000
Oscarbazepine	2-3	2-3	150-300	600-2400
Topiramate (Topamax)	5-10	1-2	25	100-400
Felbamate (felbatol)	5-10	2-4	1200	1800-3600
Phenytoin (diphenin)	5-15	1-3	200-300	200-400
Phenobarbital (luminal)	16-21	1-2	100	100-200
Ethosuximide (suxilept, pycnolepsin)	6-12	1-2	250	500-2000

Conclusion: Anticonvulsants are prescribed when the diagnosis and the nature of seizures are clarified as monotherapy. It is necessary to titrate the dose and frequency of administration. Do not make a sharp transition from one EVD to another. After an effect is achieved, the dose of the first EVD should be gradually reduced, gradually increasing the dose of the second one.

Do not prescribe anticonvulsants for short courses, unless they are used as antineuralgic drugs (neuralgia V nerve, occipital, etc.). PEP should not be combined with antidepressants, neuroleptics, cerebrolysin and some nootropics.

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