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DIAGNOSIS OF PHARMACORESISTENT FORMS OF EPILEPSIA BASED ON BIOCHEMICAL EXAMINATIONS

Yodgorov Jasurbek Jo'rayevich

Bukhara State Medical Institute named after Abu Ali ibn Sino. Bukhara, Uzbekistan.

e-mail: yodgorov.jasurbek@bsmi.uz

Annotation: The pharmacoresistant form of epilepsy (FRE) is a type of epilepsy that does not respond to traditional anti-epileptic drugs (TEA), and its correct and early diagnosis is important for improving the quality of life of patients and the treatment strategy. This article analyzes the importance of biochemical studies in the diagnosis of FRE. Biochemical parameters such as blood metabolites, neurotransmitters, antioxidant system indicators, and inflammatory markers can play an important role in the development and pathogenesis of pharmacoresistance. It was also noted that some biomarkers (glutamate, GABA, cytokines, indicators of oxidative stress) help to differentiate FRE from traditional forms of epilepsy. The results of the study show that biochemical studies in combination with clinical and neurophysiological tests allow for early detection of the pharmacoresistant form of epilepsy and individualization of treatment tactics.

Keywords: epilepsy, pharmacoresistance, biochemical markers, neurotransmitters, oxidative stress, inflammation.

ДИАГНОСТИКА ФАРМАКОРЕЗИСТЕНТНОЙ ФОРМЫ ЭПИЛЕПСИИ НА ОСНОВЕ БИОХИМИЧЕСКИХ ИССЛЕДОВАНИЙ

Аннотация: Фармакорезистентная форма эпилепсии (ФРЭ) - это тип эпилепсии, который не реагирует на традиционные противоэпилептические препараты (ПЭП), и его правильная и ранняя диагностика имеет решающее значение для улучшения качества жизни пациентов и стратегии лечения. В данной статье проанализировано значение биохимических исследований в диагностике ФРЭ. Биохимические параметры, такие как метаболиты крови, нейромедиаторы, показатели антиоксидантной системы и воспалительные маркеры, могут играть важную роль в развитии и патогенезе фармакорезистентности. Также было отмечено, что некоторые биомаркеры (глутамат, ГАМК, цитокины, показатели оксидативного стресса) помогают дифференцировать ФРЭ от традиционных форм эпилепсии. Результаты исследования показывают, что биохимические исследования в сочетании с клиническими и нейрофизиологическими тестами позволяют на ранней стадии выявить фармакорезистентную форму эпилепсии и индивидуализировать тактику лечения.

Ключевые слова: эпилепсия, фармакорезистентность, биохимические маркеры, нейромедиаторы, оксидативный стресс, воспаление.

БИОКИМЁВИЙ ТЕКШИРУВЛАР АСОСИДА ЭПИЛЕПСИЯ ФАРМАКОРЕЗИСТЕНТ ШАКЛИНИ ТАШХИСЛАШ

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Аннотация: Эпилепсиянинг фармакорезистент шакли (ФРЭ) – анъанавий противоэпилептик дори воситаларига (ПЭДВ) жавоб бермайдиган эпилепсия тури бўлиб, унинг тўғри ва эрта ташхисланиши беморлар ҳаёти сифати ва даволаш стратегиясини яхшилаш учун муҳим аҳамиятга эга. Ушбу мақолада ФРЭни ташхислашда биокимёвий текширувларнинг аҳамияти таҳлил қилинган. Қондаги метаболитлар, нейротрансмиттерлар, антиоксидант тизими кўрсаткичлари ва яллиғланиш маркерлари каби биокимёвий параметрлар фармакорезистентликнинг ривожланиши ва патогенезида муҳим рол ўйнаши мумкин. Шунингдек, айрим биомаркерлар (глутамат, ГАМК, цитокинлар, оксидатив стресс кўрсаткичлари) ФРЭни анъанавий эпилепсия шаклларидан фарқлашга ёрдам бериши таъкидланган. Тадқиқот натижалари шуни кўрсатадики, биокимёвий текширувлар клиник ва нейрофизиологик тестлар билан биргаликда қўлланилганда, эпилепсиянинг фармакорезистент шаклини эрта аниқлаш ва даволаш тактикасини индивидуаллаштириш имконини беради.

Калит сўзлар: эпилепсия, фармакорезистентлик, биокимёвий маркерлар, нейротрансмиттерлар, оксидатив стресс, яллиғланиш.

Biochemical studies are important in the diagnosis of the pharmacoresistant form of epilepsy. Since standard anti-epileptic drugs (EPPs) are ineffective in such patients, it is important to understand the mechanism of the disease and find alternative treatment methods. Epilepsy is a central nervous system disorder characterised by recurrent seizures. Some cases of this disease do not respond to standard drug treatments, which is why they are called pharmacoresistant forms. Biochemical analyses are important for determining the causes of drug-resistant epilepsy and understanding its mechanisms.

Pharmacoresistant epilepsy is a form of epilepsy that cannot be effectively treated with drugs, i.e., does not respond to anti-epileptic drugs (AEV). This condition occurs in approximately 30-40% of patients, and the number of seizures persists or does not decrease significantly. The exact causes of drug resistance have not been fully studied, but the following factors may play an important role: Based on genetic factors, some genetic mutations reduce the ability to respond to drugs; Canalopathies (problems with ion channels) can lead to resistant forms of epilepsy. Types of epilepsy and pathologies in the brain Focal (local) epilepsies can often be drug-resistant; Diseases such as tuberous sclerosis, brain dysplasia, encephalopathy. In the case of incorrectly selected treatment methods, an incorrect dosage of drugs or an inappropriate combination of NSAIDs; Non-regular medication intake. Drug elimination problems are when the liver or kidneys rapidly eliminate drugs in some patients, reducing their effectiveness. Neurological changes in the brain where medications do not affect the brain or epileptic foci are overactivated.

In pharmacoresistant epilepsy (FRE), biochemical analyses are important for assessing the pathogenesis of the disease, drug reactions, and adverse effects. For example, biochemical blood analysis Glucose - hypoglycemia or hyperglycemia can trigger epileptic seizures. Calcium, magnesium, and sodium-electrolyte imbalance can increase neuronal excitability. Liver enzymes (ALT, AST, GHTP, SHF) - creatinine and urea - participate in the assessment of kidney function, especially when taking valproate and topyramate, to assess the effect of antiepileptic drugs (AEP) on the liver. Control of the concentration of antiepileptic drugs, such as carbamazepine, valproate, phenitoin, levetiracetam, and other

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AEPs in blood serum, helps to assess the effectiveness and toxicity of drugs. Long-term use of AEP with a high level of homocysteine and folate can lead to hyperhomocysteinemia and increase the risk of cardiovascular diseases. Metabolic analyses are used to detect hyperammonaemia in patients taking ammonia (NH3) - valproate, lactate and pyruvate - for epilepsy associated with mitochondrial diseases, amino acids and organic acids - for the detection of metabolic epilepsy (for example, phenylketonuria). As for hormonal analysis, thyroid hormones (THG, T3, T4) - some AEPs - can cause hypothyroidism. Signs of polycystic ovary syndrome (PTTS) (LH, FSH, testosterone) - provide an assessment of hormonal changes in women taking valproate.

In pharmacoresistant epilepsy, the following biochemical analyses are performed: Anti-epileptic drug concentration - Determining the adequacy of drug absorption and effectiveness by assessing the amount of drugs in the blood.

Level of neurotransmitters - study of factors affecting seizures by checking the levels of glutamate, GABA (gamma-aminobutyric acid), serotonin, and dopamine.

Determination of the state of cell damage by assessing the levels of oxidative stress indicators - malondialdehyde (MDA), superoxide dismutase (SOD), and glutathione (GL).

Genetic analysis - identification of individual differences in drug metabolism and excretion by analyzing polymorphisms of genes such as CYP2C9, CYP2C19, and ABCB1.

Several studies have shown an increase in the concentration of glutamate and a decrease in the level of GABA in patients with pharmacoresistant epilepsy. Weakened antioxidant systems and a high level of oxidative stress were also identified. Based on this data, new therapy methods can be developed.

RESULT

Biochemical analyses play a key role in the diagnosis of pharmacoresistant epilepsy. Based on them, it is possible to develop personalized therapy and assess the need for a surgical approach. The results of biochemical studies in the pharmacoresistant form of epilepsy are important for a deeper understanding of the pathogenesis of this condition and the development of new therapeutic approaches. Studies show that in pharmacoresistant epilepsy, changes in the antioxidant defense system, metabolic imbalance, and disorders in the concentration of neurotransmitters are observed. Also, the analysis of such indicators as electrolytes, oxidant-antioxidant balance, and signs of inflammation (cytokine levels) plays an important role in determining the mechanism of pharmacoresistance. Based on these indicators, personalized treatment strategies can be developed.

In pharmacoresistant epilepsy, biochemical analyses are important for a better understanding of the mechanism of the disease and the development of individual therapy strategies. Based on these analyses, new drugs and treatment methods can be created, which will help improve the quality of life of patients. In pharmacoresistant epilepsy, biochemical analyses are of great importance in determining the causes of the disease, assessing the effectiveness and risk of drugs. Therefore, it is recommended to conduct regular individual analyses depending on the patient's condition.

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