

Treatment of the generalized epilepsy in compliance with the classical neurotransmitters and neuropeptides involved

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We reviewed the alterations of neurotransmitters and neuropeptides in the following brain areas involved in generalized epilepsy: hippocampus, hypothalamus, thalamus and cerebral cortex. In these brain areas, neural networks are also updated. The mechanisms of action of newer antiepileptic drugs, for example a GABA_B agonist, an AMPA receptor antagonist and brivaracetam, used in the treatment of generalized epilepsy are also pointed out. Updating the neural networks, we suggest that in the hippocampus GABAergic neurons presynaptically inhibit, via GABA_B receptors, epileptogenic neurons. GABAergic, glutamatergic, serotonergic and dopaminergic neurons form the principal neural network, while GABA and serotonin deficiency and dopamine and glutamate hyperactivity have a proconvulsant effect. In preclinical studies, the GABA_B receptor agonist GS-39,783 exerted a good antiepileptic effect. Perampanel, an AMPA receptor antagonist, showed good anticonvulsant effects in the treatment of partial-onset seizures and primary generalized tonic-clonic seizures. In this treatment, perampanel can be combined with other antiepileptic drugs. Brivaracetam, the mechanism of action of which will be explained in detail, showed a good efficacy in the treatment of adult focal seizures and secondarily generalized tonic-clonic seizures.

Biography

Felix-Martin Werner studied Human Medicine at the University of Bonn. He has been working as a Medical Teacher in the formation of geriatric nurses, occupational therapists and assistants of the medical doctor at the Euro Academy in Pößneck since 1999. He has been doing scientific work at the Institute of Neurosciences of Castilla and León (INCYL) in Salamanca (Spain) since 2002. With Prof. Rafael Coveñas, he assisted at over 30 national and 12 international congresses of Neurology and published over 60 reviews about neural networks in neurological and psychiatric diseases. Since 2014, Dr. Werner has belonged to the editorial board of the Journal of Cytology & Histology.