Aniracetam: Its Novel Therapeutic Potential in Cerebral Dysfunctional Disorders Based on Recent Pharmacological Discoveries

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ABSTRACT

Aniracetam is a pyrrolidinone-type cognition enhancer that has been clinically used in the treatment of behavioral and psychological symptoms of dementia following stroke and in Alzheimer’s disease. New discoveries in the behavioral pharmacology, biochemistry and pharmacokinetics of aniracetam provided new indications for this drug in the treatment of various CNS disorders or disease states. This article reviews these new findings and describes the effects of aniracetam in various rodent models of mental function impairment or cerebral dysfunction. Also, several metabolites of aniracetam have been reported to affect learning and memory in animals. It is, therefore, conceivable that major metabolites of aniracetam contribute to its pharmacological effects. The animal models, used in pharmacological evaluation of aniracetam included models of hypoattention, hypovigilance-arousal, impulsiveness, hyperactivity, fear and anxiety, depression, impaired rapid-eye movement sleep, disturbed temporal regulation, behavioral performance, and bladder hyperactivity. These are models of clinical disorders or symptoms that may include personality disorders, anxiety, depression, posttraumatic stress disorder, attention-deficit/hyperactivity disorder, autism, negative symptoms of schizophrenia, and sleep disorders. At present, there is no convincing evidence that promising effects of aniracetam in the animal models will guarantee its clinical efficacy. It is conceivable, however, that clinical trials will demonstrate beneficial effects of aniracetam in the above listed disease states. New findings regarding the mechanism of action of aniracetam, its central target sites, and its effects on signal transduction are also discussed in this review article.