

The NMDA receptor/NO signaling as a therapeutic target in mood disorders: Three decades adventure

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Mood disorders are chronic, recurrent mental diseases that affect millions of individuals worldwide. Although initial hypothesis of monoaminergic impairment in mood disorders is still valuable in long-term treatment of patients, accumulating data have demonstrated that glutamatergic/NMDA (N-methyl-D-aspartate) receptor/NO signaling plays a crucial role in the pathophysiology of mood disorders. As pointed out in this critical review of the literature, the hypothesis has arisen from many observations by many investigators worldwide including (i) alterations in excitatory amino acids (especially glutamate and aspartate) levels, NMDA receptor levels and functioning as well as NO levels in patients with mood disorders; (ii) improving effects of NMDA receptor/NO signaling blockers in patients with mood disorders; (iii) pre-clinical antidepressant-like effects of NMDA receptor/NO blockers in a variety of animal behavioral studies; (iv) interaction between conventional antidepressants/mood stabilizers and NMDA receptor/NO signaling modulators in several biochemical and behavioral studies; (v) biochemical/physiological evidence of interaction between monoaminergic (serotonin and noradrenaline) system and NMDA receptor/NO signaling; (vi) interaction between neurotrophic factors (e.g. BDNF) and NMDA receptor/NO signaling in mood regulation and neuroprotection; (vii) interaction between NMDA receptor and α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor signaling and finally (viii) a crucial role for NMDA receptor/NO signaling in the inflammatory processes involved in pathophysiology of mood disorders. These accumulating lines of evidence have provided a new insight into the novel approaches for the treatment of mood disorders.

Biography

Dr. Mehdi Ghasemi has completed his M.D. at the age of 27 years from Tehran University of Medical Sciences. He joined Department of Neurology at Johns Hopkins University School of Medicine in 2009. He is currently the director of Neuroscience Clinical Research Program at Neurology Institute for Brain Health and Fitness. He has published more than 50 papers in peer-reviewed journals and 27 abstracts in scientific conferences worldwide and serving as an editorial board member of "Pharmacologia" journal in the UK and reviewer for 11 international peer-reviewed journals.

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