ECRONICON OPEN ACCESS

EC PHARMACOLOGY AND TOXICOLOGY
Short Communication

Bipolar Mood Disorder and Pharmacology

Mojtaba Mafi[1]* and Fateme Rezvani[2]

[1]*Medical Doctor/Physician, Tehran University of Medical Science, Tehran, Iran*

[2]*Bioinformatics, University of Science and Culture, Tehran, Iran*

***Corresponding Author:** Mojtaba Mafi, Medical Doctor/Physician, Tehran University of Medical Science, Tehran, Iran.

Received: June 06, 2019; **Published:** July 01, 2019

Bipolar disorders refer to a chronic condition of mental disorder in which there are periods of depression sequenced by periods of mania or hypomania. In mania or hypomania, mood is significantly elevated which is not considered normal. In bipolar disorder, mood swings shift in high and low emotional level, can affect individuals everyday function and behavior. Different symptoms due to severity and durations of changes in mood and behavior, subclassified this manic- depressive disorder in several types including bipolar I disorder, bipolar II disorder and cyclothymic disorder [1,2].

The prevalence of bipolar mood disorder due to recent studies varies between 0.5 to 1.6% with the same rate in men and women. Also, it was shown that morbidity rate of this mental disorder is high, as many as patients suffer from bipolar mood disorder (BMD) finally suicide [3]. Also, studies conducted on different population did not show any substantial variation in prevalence among them [4,5]. Lifetime risk of bipolar disorder in first degree relatives of bipolar disorder patients increases via initiating in early age as well as more affected relatives, but don't differ with sex. Also, the rate of BMD among twin in twin studies was estimated 50-60%. These familial studies provided evidences indicating the importance of genetic factors role in defining the susceptibility of bipolar disorders [6].

It seems stressful events as the environmental factors participate in developing bipolar disorders where they interact with genetic factors and increases the risk of disease development [7].

Since, disturbance in gene expression besides intracellular signaling system involved in bipolar disorders, intermit limbic system, striatum and prefrontal cortex which regulate mood. limbic- striatal circuits of the prefrontal cortex controls behavior [8]. Mood swings may be triggered in bipolar disorders by neurotransmitter deficit leading to transmitter fluctuation in the synaptic cleft [9]. Although, studies indicated that more than a neurotransmission system, effective pharmacotherapy, modulate multiple interactive systems involving in mood regulating circuit [10].

Also, recent studies showed reduction in glial and neuronal cells in the prefrontal cortex where neurotoxicity damage is made by aggravated depression and mania presentation, besides diminished glial cells in limbic system, as well as decreased neuronal cells in the hippocampus play important role in bipolar disorders as well. Moreover, bipolar disorder is an organic disorder in which genetic and neurobiological diversity are presented. Besides, evidence from recent studies indicated that in bipolar disorder, dysregulation of glial–neuronal interactions is presented in which glial elements abnormalities in terms of microglia overactivity is more demonstrated than neurons abnormalities [11,12].

The SNP rs1006737 in the gene CACNA1C is related to bipolar disorder [13]. Also, alterations in DNA methylation in FKBP5 gene participates in pathogenesis of bipolar disorder [14].

Dopamine, norepinephrine, serotonin, GABA (gamma-aminobutyrate), glutamate, and acetylcholine as neurotransmitter chemicals involved in bipolar disorder have different variation.

Due to recent studies, low level of serotonin (5-HT) as central 5-HT neurotransmission are related to physiology of bipolar disorders as well as lower levels of 5-HIAA in the frontal and parietal cortex which is metabolite of serotonin [15].

As recent studies indicated, chemical imbalance in brain trigger bipolar disorder, appropriate medication can be effective in stabilizing individuals' mood as well as prophylaxis for episodes recurrency. Therefore, neuroanatomical and neurobiochemisterical basis of this disease, indicates important role of pharmacological therapy.

Lamotrigine

Lamotrigine ($C_9H_7CL_2N_5$) works as a mood stabilizer in bipolar disorder, but it works with the reduction of glutamine in the brain. Lamotrigine does not affect neurotransmitter receptors, dopamine D1 and D2, GABA and serotonin ($5\text{-}HT_3$). Also, lamotrigine blocks voltage gated sodium and calcium channels and inhibits release of excitatory neurotransmitter such as glutamate [16,17].

Sodium valproate

Sodium valproate structure is $C_8H_{16}O_2$. Valproic acid has been investigated for neuroprotective, anti-manic and anti-migraine effects. Sodium valproate has GABA inhibition effect as well. Many mechanisms contribute to its therapeutic effects including reduction in excitatory neurotransmission, modification of monoamines and weak inhibition of voltage gated sodium channels. In addition, sodium valproate is more effective than lithium when there is rapid cyclothymic cycle. Also, sodium valproate is prescribed as a mood stabilizer for patients who do not tolerate lithium side effects. Moreover, sodium valproate may be more effective than lithium for treating rapid cycling mixed state [18,19].

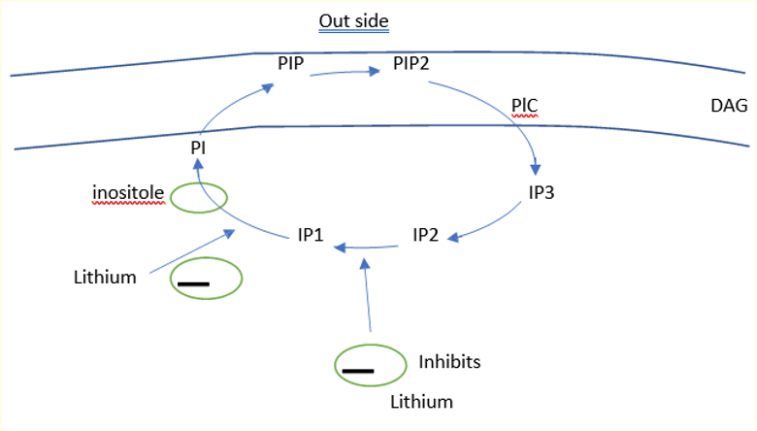
Lithium

Lithium carbonate is used to control Bipolar Mood disorders. Maintenance treatment by lithium decreases mania and manic behaviors and control the mood fluctuations frequency. GI absorption of lithium is very fast and distributes across all body water. lithium Half-life is 20 hours and after it will excrete from kidneys. We must control plasma level of lithium in short period of time. Plasma therapeutics concentration is 0.6 - 1.4 meg/lit [20,21].

Physicians should consider that diuretics can increase the lithium plasma level, in order to decrease body water.

Synaptic brain neuron membrane

Lithium can inhibit this circle in Neuron Membrane and control Mood Fluctuations here.



PLC: Phospholipase; PI, PIP, PIP2, IP2, IP1: Precursor of IP3.

Bibliography

1. Bonnín CM., *et al*. "Subthreshold symptoms in bipolar disorder: impact on neurocognition, quality of life and disability". *Journal of Affective Disorders* 136.3 (2012): 650-659.

2. Goodwin F and Jamison K. "Manic-depressive illness: bipolar disorders and recurrent depression.2nd ednition. Oxford University Press, New York (2007).

3. Gonda X., *et al*. "Suicidal behavior in bipolar disorder: epidemiology, characteristics and major risk factors". *Journal of Affective Disorders* 143.1-3 (2012): 16-26.

4. Merikangas KR., *et al*. "Prevalence and correlates of bipolar spectrum disorder in the world mental health survey initiative". *Archives of General Psychiatry* 68.3 (2011): 241-251.

5. Nivoli AMA., *et al*. "Gender differences in a cohort study of 604 bipolar patients: the role of predominant polarity". *Journal of Affective Disorders* 133.3 (2011): 443-449.

6. Duffy A. "The early course of bipolar disorder in youth at familial risk". *Journal of the Canadian Academy of Child and Adolescent Psychiatry* 18.3 (2009): 200-205.

7. Koenders MA., *et al*. "Stressful life events in bipolar I and II disorder: cause or consequence of mood symptoms?" *Journal of Affective Disorders* 161 (2014): 55-64.

8. Brunello N and Tascedda F. "Cellular mechanisms and second messengers: relevance to the psychopharmacology of bipolar disorders". *International Journal of Neuropsychopharmacology* 6.2 (2003): 181-189.

9. Blazer DG. "Mood disorders: epidemiology". In: Sadock BJ, Sadick VA, editors. Kaplan & Sadock's comprehensive textbook of psychiatry. 7th ed. Philadelphia: Lippincott Williams & Wilkins (2000): 1298-1308.

10. Chen G., *et al*. "Regulation of signal transduction pathways and gene expression by mood stabilizers and antidepressants". *Psychosomatic Medicine* 61.5 (1999): 599-617.

11. Rajkowska G. "Cell pathology in bipolar disorder". *Bipolar Disorders* 4.2 (2002): 105-116.

12. Magalhães PV., *et al*. "Mediators of allostasis and systemic toxicity in bipolar disorder". *Physiology and Behavior* 106.1 (2012): 46-50.

13. Craddock N and Sklar P. "Genetics of bipolar disorder". *Lancet* 381.9878 (2013): 1654-1662.

14. Huzayyin AA., *et al*. "Decreased global methylation in patients with bipolar disorder who respond to lithium". *International Journal of Neuropsychopharmacology* 17.4 (2014): 561-569.

15. Shiah IS and Yatham LN. "Serotonin in mania and in the mechanism of action of mood stabilizers: a review of clinical studies". *Bipolar Disorder* 2.2 (2000): 77-92.

16. Kedar S., *et al*. "Bhatt, Management of bipolar depression with lamotrigine: an antiepileptic mood stabilizer". *Frontiers in Pharmacology* 6 (2015): 242.

17. Hahn CG1., *et al*. "The current understanding of lamotrigine as a mood stabilizer". *Journal of Clinical Psychiatry* 65.6 (2004): 791-804.

18. Miura T., *et al*. "Comparative efficacy and tolerability of pharmacological treatments in the maintenance treatment of bipolar disorder: a systematic review and network meta-analysis". *Lancet Psychiatry* 1.5 (2014): 351-359.

19. Geddes JR., *et al*. "Lithium plus valproate combination therapy versus monotherapy for relapse prevention in bipolar I disorder (BALANCE): a randomised open-label trial". *Lancet* 375.9712 (2010): 385-395.

20. Malhi GS., *et al*. "Current Status of Lithium in the Treatment of Mood Disorders". *Current Treatment Options in Psychiatry* 1.3 (2014): 294-305.

21. Malhi GS., *et al*. "Potential mechanisms of action of lithium in bipolar disorder. Current understanding". *CNS Drug* 27.2 (2013): 135-153.

Volume 7 Issue 7 July 2019