Journal of
Formulation Science & Bioavailability

Aswal, J Formul Sci Bioavailab 2019, 3:1
DOI: 10.4172/2577-0543.1000123

Commentary Article Open Access

Esketamine Nassal Spray Drug to Cure Depression

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Depression is very common mental disorder that present with Low appetite, Sadness, loss on interest or pleasure in daily activities including sex, mood swings, improper sleep and improper concentration, feeling of hopelessness, Lack of Joy etc., It may occur in person of all gender and age and it seems to be more common among women as compared to men's [1]. According to the global survey of Centers for Disease Control and Prevention (CDC) around 7.8 percent of people over the age of 10-12 have depression and as per the World health organization (WHO) survey around 300 to 350 million peoples are affected by depression. Depression may disturb the social behavior of a person among the other individuals and may leads to commit suicide sometimes. Depression is second largest leading cause of suicides or death in youngster having age limit of 19-30. Many researches are going to be done to cure the depression through Drug therapy, Natural Therapy etc. and in this short communication article a concern have being given to the most useful drug to cure the depression i.e. Esketamine (S-Ketamine) with his new route of administration [1].

Esketamine

Esketamine drug is used in the treatment of restrictive depression in adults. In 1997 Esketamine is introduced in medical use and now in March 5th, 2019 it is approved by FDA for the treatment of depression in adults by nasal route. One of good advantage of Nasal Spray is that it will act faster and potentially help those patients which experience suicidal thoughts more quickly.

It is the non-competitive N-methyl-D-aspartate (NMDA) receptor antagonist and up to some extent it will also act on dopamine reuptake inhibitor but do not interact with sigma receptor as like ketamine drug. It is a form of ketamine drug which is approved by FDA in 1970 which having two chemical forms R and S and Esketamine contain on of it and i.e. S form (Figure 1).

Several researches have been suggested that Esketamine is the very useful drug with very good pharmacological action to cure depression as compared to R-ketamine (Arketamine). However, the study in mice somewhat different and that is the Arketamine having long lasting pharmacological action then Esketamine but the fact which will make Esketamine more potent and best drug in use the Arketamine are [2,3].

- Esketamine have 3-4 times more affinity with Phencyclidine (PCP) binding sites then arketamine at N-methyl-D-aspartate (NMDA) receptor.

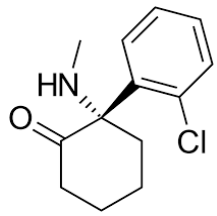

Figure 1: Structure of S-ketamine.

- Esketamine will inhibit the dopamine transporter eight times more the Arketamine due to which the dopamine activity is increased in the brain and somewhat the depression will be cured.
- Arketamine will decrease the glucose metabolism and on the other side Esketamine will increase the Glucose metabolism in frontal lobe of the brain.

Recently, FDA approved Esketamine drug nasal spray under the brand name of *Spravato or Ketanest* to cure severe depression (Figure 2). The all procedure for that drug has been done by Johnson & Johnson Company. Because of the severe adverse effects resulting in sedation and dissociation while in the administration of the Spravato, the FDA recommended that Spravato will be only available through the restricted distribution system under a Risk Evaluation and Mitigation Strategy (REMS) and must be administered to the patent in a certified medical office under the supervision of the authorized health care faculty [4].

Previously ketamine is the very effective drug to cure the depression but now researcher decided a different part of the brain in which might be the ionotropic glutamate receptor is also involved for the treatment of the depression.

Figure 2: Spravato nasal spray.

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Received June 10, 2019; **Accepted** June 12, 2019; **Published** June 19, 2019

Citation: Aswal N (2019) Esketamine Nassal Spray Drug to Cure Depression. J Formul Sci Bioavailab 3: 123.

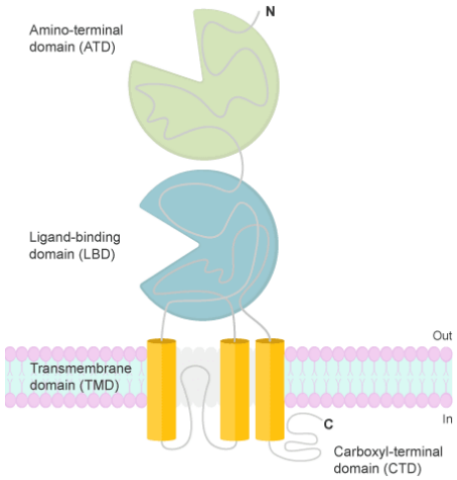

Figure 3: Ionotropic glutamate receptors.

Ionotropic Glutamate Receptor (IGR) is the ligand-gated ion channel which will be activated by the Glutamate neurotransmitter (Figure 3).

These receptors are responsible for the transmission of excitatory chemical signals through the Centre nervous system and are the key point to strengthen or weaken the ability of the synapses i.e. synaptic plasticity [5-7]. Like other drugs the common side effects that are observed in the trials are Vomiting, Anxiety, and Increase in Blood Pressure, Vomiting, Nausea, dissociation, and Sedation but in case of efficacy this drug is a potent and helpful drug to cure serious depression.

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