

Ketamine Use in Treating Treatment-Resistant Depression

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Introduction

Major depressive disorder (MDD) is the clinical term used for depression in the United States and it's one of the most common mental illnesses in the world affecting roughly 350 million people and making it a prevalent cause of disability worldwide (Schwartz, 2016). Individuals with MDD have been associated with elevated mortality and morbidity and according to one study, the physical impairments due to MDD is similar in magnitude of those found in chronic diseases such as diabetes and cancer (Surtees et al., 2003). Major depressive disorder is also associated with poor social and occupational outcomes and has a significant economic consequence due to increased health care costs and increased costs in a loss of productivity (McLaughlin, 2011). The most common method of treating MDD is the use of certain antidepressant medications which target the monoamine system which pertains to neurotransmitters: serotonin, dopamine, and noradrenaline. It is believed that low levels of these neurotransmitters are associated with various aspects of depression, so the goal of these drugs is to increase the deficient neurotransmitters but unfortunately, up to one-third of individuals with MDD, the standard medications are ineffective. For those individuals, they are diagnosed with treatment-resistant depression (TRD). TRD can exacerbate the symptoms of depression and can make those individuals feel even more hopeless in finding treatment that will help attenuate the symptoms of depression.

Aim

TRD shows that depression is highly complex and not just a chemical imbalance of monoamine neurotransmitters. It is therefore important for researchers to continue to try and understand the mechanisms of depression and to develop more effective drugs or investigate alternative drugs that focus on novel molecular targets outside the monoamine system (Wei, 2020).

Goal

In recent decades, ketamine IV infusions have shown to have transient and rapid antidepressant effects and in addition it's an NMDA receptor antagonist which works differently than the standard antidepressant medication which act on the monoamine system. The goal is to evaluate whether the transient antidepressant effects of ketamine can be prolonged and sustained in patients that have treatment-resistant depression.

Method

Phillips 2019, did a great clinical study that evaluated the effectiveness of a single ketamine infusion, repeated infusions, and the maintenance of ketamine infusions for participants diagnosed with treatment-resistant depression. All of the participants chosen were diagnosed with treatment-resistant depression (TRD). The study was broken down into three phases. In the first phase, forty-one participants were randomized into a double-blind crossover treatment to test the effectiveness of a single ketamine infusion. The effectiveness of treating the symptoms of depression was evaluated using a Montgomery-Åsberg Depression Rating Scale (MADRS). After the patients relapsed and returned to their baseline, they progressed to phase 2. In phase 2, the participants were given 3 weekly ketamine infusions and they did this for two weeks for a total of 6 ketamine infusions. The purpose of phase 2 was to evaluate the effectiveness of a series of ketamine infusions. The participants who scored greater than a 50% decrease in their MADRS scores were classified as responding effectively to the treatment and progressed to phase 3 (maintenance phase). During the maintenance phase, weekly ketamine infusions were reduced to once a week and was maintained for 4 weeks.

Results

The results for phase 1 showed that there was a significant reduction in the MADRS score post-ketamine infusion when compared to control. The results for phase 2 showed that 59% of the participants responded effectively to the ketamine infusions and again those participants were moved on to phase 3. The results for phase 3 showed that the ketamine infusions continued to give antidepressant effects for 91% of the participants.

Conclusion

Depression is one of the most common mental disorders in the world. The standard anti-depressant medications target neurotransmitters such as serotonin, dopamine, and noradrenaline and for many people with depression, up to one-third, the standard medications are ineffective in treating the symptoms. These individuals are diagnosed with treatment-resistant depression (TRD). There is a clear need of a drug that acts on a different pathway than the standard antidepressant medications. In recent decades, ketamine infusions have shown to have antidepressant effects and in addition it's an NMDA receptor antagonist which works in a different way than the standard antidepressant medication. Ketamine has shown to be effective with TRD patients and according to a clinical study done by Phillips 2019, the antidepressant effects can be prolonged and maintained.

References

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