KETAMINE INFUSION AS A TREATMENT FOR MAJOR DEPRESSIVE DISORDER: A NEW ROLE FOR ANESTHESIOLOGISTS?

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A 2003 study indicates that the lifetime prevalence of major depressive disorder (MDD) is 16.2% and that in a 12 month period 13.1 to 14.2 million US adults will suffer from MDD[1]. MDD can be a devastating illness, affecting every aspect of a person's life. An emerging therapy involving ketamine administration for the treatment of MDD has shown promise in treating those who have not been responsive to conventional pharmacological therapy, as well as those unresponsive to ECT therapy[2-6]. We report the first administration of this therapy by anesthesiologists. Written informed consent was obtained from the patient granting permission for publication of this article.

Case Report

A 42 yo, 80 kg woman presented from home with MDD, diagnosed at age 17, and a recent suicide attempt. She had been treated with conventional biogenic amine antidepressant medications, her symptoms remained unresponsive however. Her depression was complicated by inhalant abuse and unemployment. Her past medical history included irritable bowel syndrome and low back pain. Her past surgical history was insignificant. She was not interested in receiving ECT.

After a thorough history and physical exam, including labwork (CBC, BMP, and urinalysis) and EKG, she was received in the PACU for ketamine infusion therapy. Standard ASA monitors were placed and oxygen was given via a simple oxygen mask. A 22 gauge IV was placed in her left hand. Ketamine (50 mg) was diluted in a 50 mL bag of normal saline and 40 mL were delivered via an infusion pump. The infusion was delivered as per recommendations from our psychiatry department and current literature, with a dose of 0.5 mg/kg delivered over ten minutes[7]. She was subsequently monitored and remained under anesthesia care for 40 minutes in total.

During the infusion, typical signs of ketamine administration including nystagmus, confusion, and hallucinations, as well as increased blood pressure and heart rate were exhibited. She maintained spontaneous respirations and was communicative throughout therapy. She did experience some agitation that was treated successfully with two, 1 mg doses of IV midazolam.

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After therapy she remained under the care of the psychiatric department and was discharged three days later. Her mood and symptoms improved beginning with the ketamine infusion and lasted throughout her admission. Initially, she had rated her guilt on a visual analog scale at a 9/10. Upon discharge, she rated it at 4.5/10. She also reported to psychiatry staff that before she had received the ketamine therapy, she was planning on committing suicide upon discharge. She stated that after receiving the therapy, she no longer had this desire and felt positive about her future. She returned to psychiatric clinic for follow-up two weeks later. At this time, she reported that she felt "wonderful" for ten days but relapsed into depression thereafter.

Upon interview 6 months after the treatment, she reported that her depression was less than what it had been for years for a period of 2-3 months. She also reported that before the treatment she took 3-4 ibuprofen daily for her low back pain. Since the treatment, her back pain has completely resolved.

Discussion

A lot of questions remain unanswered regarding the unexpected effectiveness of this therapy. Based on current literature and supported by our case, NMDA antagonism as a treatment for refractory depression appears promising[3,7-8]. With conventional biogenic-amine-based antidepressants (SSRI's/MAOI's), a period of several weeks is typically needed in order for these medications to take effect. Ketamine has been shown to exert its antidepressant effects within 2 hours of infusion; a clear advantage[3]. Although, it is unclear at this point how long the effects of a single ketamine infusion may last, a recent case study reported sustained positive results for 3 months with a trial of 6 infusions over 2 weeks[8]. This, unfortunately, is also a case report from a single patient. Larger studies report more modest results with peak effect occurring at 2 days and lasting around one week[3,7].

Ketamine has also been studied extensively as an adjuvant to opioid use in pain control. It has been suggested that the antidepressant properties contribute to pain relief. The magnitude of this effect, has not been thoroughly described. Depression is 3-4 times more common in patients with chronic back pain than reported in the general population[9-11]. Given the evidence of ketamine's antidepressant effects and high prevalence of depression amongst those with chronic pain, it is likely that its antidepressant effects are playing a role in decreased opioid requirements in chronic pain patients, as pain can often be a symptom of depression.

Conventional biogenic-amine-based antidepressants have also been shown to produce functional and quantitative changes of AMPA receptors, indicating the receptor's involvement in depression[12-13]. Work is continuing in this area. With the recent interest in ketamine as an antidepressant and the ability of anesthesiologists to safely and effectively administer this medication, it is likely that anesthesia providers will be more commonly involved in delivering this therapy.

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