

Treatment of Treatment Refractory Recurrent Major Depressive Disorder in a Patient with Squamous Cell Carcinoma of the Lung: A Case Report

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Abstract:

Ketamine has become a novel therapy in the treatment of Major Depressive Disorder that is refractory to the current standard of care, such as pharmacotherapy and Electroconvulsive Therapy (ECT). This case report details a treatment-resistant 64-year-old female with a history of squamous cell carcinoma of the lung and recurrent Major Depressive Disorder (MDD) that was refractory to pharmacotherapy and ECT. The patient then received a regime of ketamine infusions for the treatment of MDD. After ketamine therapy, she experienced significant improvement in her mood and outlook, leading to a change in her decision to accept radiation therapy for her squamous cell lung carcinoma. This case report demonstrates the role of ketamine therapy in changing the trajectory of patients with refractory depression and complex medical comorbidities.

Keywords: Major Depressive Disorder, Major Depressive Disorder Treatment, Ketamine, Ketamine Depression, Electroconvulsive Therapy (ECT).

INTRODUCTION

Routine treatment of MDD commonly utilizes monoamine-modulating pharmacotherapy or psychotherapy, with ECT reserved for refractory cases. However, the disease remains difficult to treat, and symptoms often take 4-12 weeks to resolve. According to the literature, the prevalence of Major Depressive Disorder is approximately 5% [1]. Ketamine is a dissociative anesthetic that has many uses at different doses. Recent literature suggests that intravenous (IV) ketamine can help treat Major Depressive Disorder that is refractory to treatment as usual. According to the Journal of Clinical Psychiatry, a dose of 0.5 mg/kg as an IV infusion over 40 minutes is commonly used [2].

CASE PRESENTATION

Our 64-year-old patient (henceforth referred to by the pseudonym Ms. K). Ms. K is a divorced, unemployed Caucasian female who presented to the emergency department with suicidal ideation. She was brought to the hospital after walking into a police station, stating, "If I had a gun, I would kill myself." Ms. K was subsequently admitted to the inpatient psychiatric unit for stabilization and further evaluation. She reported a depressed mood endorsing hypersomnia, anhedonia, extreme guilt, low energy, poor concentration, decreased appetite, and suicidal thoughts. Her orientation and memory were somewhat impaired, and her overall outlook was poor. She also presented with a tangential thought process and could not maintain a linear, coherent conversation.

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In the past, Ms. K was diagnosed with Major Depressive Disorder, recurrent, severe, without Psychotic Features, at the age of 32. Her history was significant for Squamous Cell Lung Carcinoma, Hypertension, and Thickened Endometrium. An extensive electronic medical record review revealed no history of a past manic episode. Ms. K was noted to have been trialed on adequate doses and durations of many different psychotropic medications, including chlorpromazine, valproic acid, vortioxetine, cariprazine, lurasidone, ziprasidone, lithium, sertraline, amitriptyline, clonazepam, and quetiapine. She reported little to no improvement with the medications and endorsed significant adverse side effects of the medication trials. At the time of admission, Ms. K was taking clonazepam and quetiapine with no relief. She also had three previous inpatient ECT treatments. However, during the last two ECT treatments, Ms. K had an extensive episode of sinus pause immediately after stimulus administration. Therefore, the anesthesia team felt the patient was too high risk to proceed with future ECT treatment. Ms. K continued to have suicidal thoughts associated with major depressive disorder.

Ms. K was diagnosed with squamous cell carcinoma of the lung in April of 2022. She refused treatment at that time and said that she just wanted to die. In April, the lung mass was found to be 2.2 X 1.6 cm with a staging of T1N0. A repeat CT found the mass to have increased to 4.0 X 3.9 cm on 8/29 with stage IB cT2aN0m0 found to be in the right bronchus, lower lobe.

Ms. K also had a history of extensive psychosocial issues. She was previously married with three children. However, her youngest son committed suicide in 2012. Subsequently, her husband became an alcoholic, and she was assaulted and battered by him. After separating from her husband, she became homeless. Ms. K was raped at a homeless shelter which caused her difficulty

feeling comfortable going to other homeless shelters, and as a result, she was mostly living on the street. Due to the patient's social circumstances, she encountered barriers to care, which contributed to noncompliance with pharmacotherapy and other medical treatments.

METHODS

Prior to ketamine treatments, the Hamilton Depression Rating Scale (HAM-D) survey was administered to Ms. K. The HAM-D scale is a highly validated scale used for measuring major depression severity and is based on 21 items. However, the score is calculated from the first 17 items. The scale was administered to Ms. K each morning before each treatment as well as the day after treatment. According to current literature, the internal validity of the HAM-D survey is robust, and it has been considered the gold standard for years^[3].

Ms. K was continued on clonazepam and quetiapine for the entirety of her inpatient stay. The clonazepam was held on the morning of treatment days. She was given a three dose regimen of intravenous (IV) ketamine therapy during her inpatient stay. Ms. K received a dose of 0.5 mg/kg IV infusion over 40 minutes on three separate occasions spaced one week apart. During Ms. K's infusions, she was given calming music, without lyrics, to listen to through noise-canceling headphones in a private room.

Ms. K was given this therapy in the intensive care unit (ICU) out of an abundance of precaution. She was monitored using noninvasive blood pressure monitoring, pulse oximetry, and three lead electrocardiogram (ECG). Also, due to the potential transient increase in blood pressure and history of hypertension, the patient was pretreated with 0.1 mg clonidine one hour prior to treatment. After treatment, she was monitored for one hour

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in the ICU before returning to the inpatient psychiatric unit.

RESULTS

The results from the HAM-D score can be seen in table 1. The patient started at a score of 29, which indicated very severe depression. Ms. K's lowest score was in the morning before the second treatment. One week after Ms. K's first treatment, she scored 17 points, which indicates moderate depression. After all three treatments, Ms. K scored an 18, which indicates moderate depression. Ms. K consistently reported she had extreme feelings of guilt which was worth four points. However, Ms. K did report less depressed mood symptoms after three treatments, which contributed to one point instead of four at the start of the treatments.

Table 1.
HAM-D Scale Results

Time Administered	Scale Score	HAM-D Scale Score	HAM-D Scale Severity
On Admission		29	Very Severe Depression
Morning of Treatment 1		28	Very Severe Depression
Afternoon After Treatment 1		29	Very Severe Depression
Morning of Treatment 2		17	Moderate Depression
Afternoon After Treatment 2		22	Severe Depression
Morning of Treatment 3		20	Severe Depression
Afternoon After Treatment 3		18	Moderate Depression

DISCUSSION

Ms. K reported that she felt increasingly better after each treatment. However, she reported that she did not have a good experience during her first treatment. Ms. K stated that she felt as if the ketamine opened her mind to different ideas and memories that she had not thought of in a while, and the level of introspection was somewhat frightening to her. She reported that the feeling did subside after about four hours. Ms. K reported a better experience during the following two infusions. She stated that she felt calm, and even though she was able to self-reflect and be introspective, it was not an unsettling

experience. She reported that her feelings of guilt significantly decreased after the therapy.

Ms. K reported that she was able to have more meaningful conversations with her son over the phone, and she felt more at peace with her past decisions. After talking with her son and receiving ketamine therapy, she was more optimistic about her cancer treatment. This change was significant as originally, she was hesitant to start treatment, despite the high success rate of treatment for her cancer.

Ms. K had extensive barriers to good healthcare for multiple reasons. Along with being homeless, Ms. K had trust issues with the medical system and her providers due to her past trauma history. Ms. K did not feel safe in many of her living conditions. She was unable to have continuous access to her medications as well. Further, she could not be compliant with her medications when she did have them due to her inability to take them and access her medications consistently. . . Due to these reasons, Ms. K's treatment for her psychiatric and medical conditions was hindered and, in some cases, delayed. The repercussions regarding her prognosis are unknown.

Approximately 10-20 percent of patients in treatment for depression are thought to meet the criteria for treatment-resistant depression. This disorder is difficult to treat and often limits patients' quality of life and daily activities. Recent literature describes how using ketamine in treatment-resistant depression can be effective, with rapid results in some cases. Despite robust literature, smaller case reports have shown benefits. Furthermore, ketamine has been shown to improve clinical symptoms within hours to days after administration. It has also been shown to reduce suicidality in treatment-resistant depression [4]. This is important for patients with acute depression, especially in complex medical illnesses.

CONCLUSION

The use of ketamine should be considered as a therapy for the treatment of refractory recurrent major depressive disorder without psychosis refractory as a mainstay treatment. Ketamine is a safe and effective medication when used in the right setting and can considerably decrease depressive symptoms. Further studies on the use of ketamine in psychiatry are recommended, including more data to evaluate the entirety of its applications.

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