A Tale of (at Least) Two Drugs: Ketamine in the Setting of Catatonia

Presented by Dr. Dallas Hamlin, MD
With Drs. Sanjay Yadav, MD and Charles Mormando, DO
Learning Objectives / Outline

• Describe two clinical cases of catatonia involving ketamine during treatment

• Review known pharmacology of ketamine

• Discuss results of systematic literature review

• Opine on future opportunities for clinical research
Case 1: Ketamine as an adjuvant anesthetic for ECT
Case 2: Ketamine as needed for agitation
Pharmacology

• Derivative of phencyclidine
• Non-competitive NMDA Antagonist, activity at dopamine and opioid receptors
• Variable doses based on indication (1-3)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Dose</th>
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<tbody>
<tr>
<td>Depression</td>
<td>0.5 mg/kg (IV)</td>
</tr>
<tr>
<td>Acute Agitation</td>
<td>1-2 mg/kg (IV)<em>, 4-5 mg/kg (IM)</em></td>
</tr>
<tr>
<td>Continuous Sedation</td>
<td>0.125–2 mg/kg/hour</td>
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* May give additional doses, typically dissociative at this dose
Concerns

• Causes psychotic and catatonic symptoms in healthy controls (4,5)

• Exacerbates psychosis in patients with schizophrenia, mixed results in affective psychosis (6,7)
Literature Review

- PubMed and Web of Science were systematically reviewed for English-language studies and case reports of humans discussing both ketamine and catatonia.

- Dosages of ketamine, temporal relationship to catatonia symptoms, concomitant therapies, and outcome were collected when available.

- The references of selected papers were also reviewed.
Case Reports I

CASE REPORT

Electroconvulsive therapy with S-ketamine anesthesia for catatonia in coexisting depression and dementia

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ABSTRACT

Information on efficacy and safety of electroconvulsive therapy in patients with dementia is sparse. The current case report describes a patient suffering from severe depression and dementia who received electroconvulsive therapy with S-ketamine anesthesia at our psychiatric intensive care unit for the treatment of her therapy-resistant catatonic stupor. The patient’s condition improved remarkably through the treatment. By the end of 16 electroconvulsive therapy sessions, her catatonic symptoms remitted entirely, her affect was brighter and she performed markedly better at the cognitive testing.
Electroconvulsive therapy (ECT) with ketamine induction for catatonia in an HIV positive patient

Introduction: The successful use of ECT as treatment for catatonia, in the context of HIV (human immunodeficiency virus) infection, has been described previously. Ketamine has been used as an anaesthetic induction agent for ECT, although not considered the induction agent of choice. There are also case reports suggesting that ketamine may be an alternative treatment specifically for catatonia.

Patient presentation: This case report describes the management of a female patient who presented with catatonia, evidenced by stupor, waxy flexibility, mutism, negativism, and stereotypy, as well as stage four HIV infection, with poor response to previous psychotherapeutic interventions.

Management and outcome: We describe the course of management of this patient with ECT, following poor initial clinical response to ECT with propofol induction, the subsequent use of ketamine as an anaesthetic induction agent for ECT, with associated improvement in seizure quality, and good overall clinical response to ECT demonstrated thereafter.

Conclusion and contributions: This case report suggests that ketamine may be a viable induction agent for ECT in this clinical setting.

Keywords: ECT; case report; Ketamine; HIV; catatonia.
Ketamine for acute catatonia:
A case report
CATATONIA-LIKE SYNDROME TREATED WITH LOW-DOSE KETAMINE

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<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litvan</td>
<td>2017</td>
<td>Switch to ketamine anesthesia from methohexital led to improvement in patient with dementia and catatonia, but this was not correlated to any improvement in seizure quality/duration</td>
</tr>
<tr>
<td>Nel</td>
<td>2023</td>
<td>Switch to ketamine from propofol led to better outcome for patient with HIV and catatonia (and seizure indices better), most prominent after ketamine 2</td>
</tr>
<tr>
<td>Kobayashi</td>
<td>2021</td>
<td>44F usually hospitalized for weeks to stabilize from catatonia leaves ED same day after 10 mg IV ketamine (but also got lorazepam) 0.2 mg/kg</td>
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<tr>
<td>Iserson</td>
<td>2021</td>
<td>23M Acute catatonia responsive to 0.03 mg/kg ketamine (12.5 mg total dose)</td>
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What does this all mean?

Figures from reference 12
Ketamine can:

• Directly antagonize NMDA receptors on glutaminergic cells (13).

• Selectively inhibit subtypes of GABA-A Receptors (14).

• Increase Striatal Dopamine (15)

• These are all consistent with known catatonia therapies
What does this all mean?

• Multiple mechanisms to change catatonia symptoms

• Complicated by trait versus state characteristics

• Not dissimilar to lorazepam’s effect in patients with catatonia
Future Directions

• We need more case reports and/or prospective studies

• Most exciting in place where benzodiazepine dose has a “ceiling” due to sedative effects or interference with ECT treatment
References