Title

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BRIEF CLINICAL UPDATE

Ketamine Infusion Protocol in Chronic Pain Management: An Outpatient Approach for Ambulatory Surgery Centers

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Abstract

Ketamine infusion therapy has received increasing attention as chronic pain treatment. This described a comprehensive protocol considered for adoption by UCLA ambulatory centers for ketamine infusions in management of chronic pain. The protocol includes patient selection criteria, dosage regimen, monitoring procedures, and adverse event management. The protocol was developed after thorough review. It provides an evidence-based framework for safe and effective ketamine infusion therapy.

Introduction

Chronic pain is a complex and challenging medical condition that significantly affects patient's quality of life. Traditional pain management approaches, such as opioids and nonsteroidal anti-inflammatory drugs (NSAIDs), have limitations in providing long-term relief and are potentially associated with adverse effects, necessitating novel therapeutic approaches. Ketamine, an N-methyl-D-aspartate (NMDA) receptor antagonist, has shown promise as an adjuvant therapy for chronic pain.[1-8] This protocol aims to establish a standardized approach for ketamine infusion therapy at UCLA Ambulatory Surgery Centers, integrating current medical literature to guide clinical practice.

Patient Selection Criteria and Pre-infusion Assessment

Patient selection is crucial to the success of ketamine infusion therapy. Candidates for this therapy should meet the following criteria with the information listed.

1. Documented diagnosis of chronic pain lasting more than three months.
2. Failure of conventional treatments, such as opioids and nonsteroidal anti-inflammatory drugs.
3. Absence of contraindications, including uncontrolled hypertension, active psychosis, active substance abuse, poorly controlled cardiac conditions or history of ketamine-related adverse events.[9]
4. Detailed medical history.
5. Physical examination.
6. Psychological assessment to identify any potential mental health concerns.[9]
7. Informed consent obtained after discussing potential risks, benefits, and alternatives and discussing the patient's pertinent questions.
8. The patient should be instructed to abstain from food and drink for at least 6 hours prior to the infusion.
9. The patient should be advised to continue taking any prescribed pain medications, but to avoid any medications that may interact with ketamine, such as benzodiazepines.

Dosage Regimen

The dosing of ketamine infusions should be individualized based on the patient's response and tolerance. A typical dosing regimen involves a subanesthetic dose administered intravenously over a specific duration, often referred to as a "ketamine infusion series." Ketamine infusions will be administered intravenously with the following dosing schedule. However, the protocol is subject to adjustment based on the patient's response and the clinician's judgment.[10]

1. The patient will be placed in a comfortable chair or bed.
2. An intravenous (IV) line will be inserted into the patient's arm or hand.
3. The ketamine infusion will be started at a low dose, typically around 0.1-0.2 mg/kg/hr, and gradually increased over time to a maximum dose of 0.5-1.0 mg/kg/hr. The infusion rate can be increased by increments of 0.1 to 0.2 mg/kg/hr every 15 to 30 minutes until pain relief is achieved or side effects become intolerable.
4. The infusion will be administered over a period of 3-6 hours, depending on the patient's response and tolerance to the medication.

Monitoring and Assessment

Close monitoring is necessary to ensure patient safety and treatment efficacy. The following measures will be undertaken:

1. Vital signs, including every 15 minute blood pressure measurement, and continuous heart rate, ECG, oxygen saturation, and EtCO2 monitoring during the infusion.

2. Patients should also be monitored for potential adverse effects, including psychomimetic symptoms (hallucinations, delusions) and dissociative experiences.
3. Sedation level will be assessed using a validated scale at regular intervals.
4. Pain intensity scores will be recorded using a numeric rating scale (NRS) before, during, and after the infusion.

Adverse Event Management

In the event of adverse events, appropriate actions will be taken:

1. Common adverse events include mild to moderate psychotomimetic effects that typically can be managed through supportive care and reassurance Other common adverse events include nausea and vomiting, transient increases in blood pressure and heart rate, blurred vision and urinary symptoms.
2. Severe adverse events, such as hallucinations or cardiac arrhythmias, will prompt immediate cessation of the infusion and administration of appropriate interventions.
3. If adverse effects occur, the infusion rate should be adjusted or temporarily halted as needed. Clinicians should be prepared to manage potential emergent reactions, and resuscitative equipment should be readily available during the infusion.

Post-infusion Care

1. The patient should be observed for at least 1 hour following the completion of the infusion to ensure that they are stable and alert.
2. The patient should prearrange transportation home, as they may feel drowsy or disoriented after the procedure.
3. The patient should be advised to avoid driving or operating heavy machinery for at least 24 hours following the infusion.
4. The patient should be advised to contact their physician if they experience any adverse reactions or side effects, such as nausea, vomiting, or hallucinations.

Follow-up and Efficacy Evaluation

Patients' responses to ketamine infusion therapy will be evaluated through follow-up appointments. Pain scores, functional outcomes, and any adverse effects will be documented and analyzed. The frequency of follow-up visits will be determined based on individual patient needs but typically, regular follow-up visits are essential to assess the sustainability of pain relief and address any emerging concerns.

The efficacy of ketamine infusion therapy should be assessed using standardized pain scales, such as the Visual Analog Scale (VAS) or the Numeric Rating Scale (NRS), before and after each infusion session. Additionally, functional improvement and reduction in medication usage should be monitored.

The duration of ketamine infusion therapy can vary based on individual patient response. Infusions are typically administered over a period of days to weeks, with a gradual tapering of dosage as pain improves. Patients who show significant improvement during ketamine infusion therapy will be transitioned to an appropriate maintenance regimen, which may include oral medications or less frequent infusions.

Conclusion

This protocol provides a structured approach to ketamine infusion therapy for chronic pain, grounded in the synthesis of current medical literature. It serves as a guide for clinicians at UCLA's Ambulatory Surgery Centers to administer safe and effective ketamine infusions while ensuring patient well-being and successful treatment.

This protocol outlines key considerations for patient selection, dosing, monitoring, and adverse effects management based on current medical literature. As the field continues to evolve, further research is warranted to refine protocols and establish long-term efficacy and safety outcomes.

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