

Drug-Induced Unilateral Blurred Vision following IV Fentanyl and Ketamine in Pregnancy

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Abstract

Adverse drug reactions (ADRs) with ketamine and fentanyl are well described, yet ophthalmological effects remain uncommon. Blurred vision, particularly unilateral, is rarely reported. We describe a 27-year-old primigravida at 32 weeks of gestation who developed sudden-onset unilateral blurred vision following intravenous infusion of ketamine and fentanyl administered for acute pancreatitis-related pain. This case was a part of elective in pharmacovigilance for MBBS Professional IIIrd year Part 1. This case underscores the importance of recognizing rare ocular ADRs with commonly used analgesics such as ketamine and fentanyl. Early identification can prevent unnecessary interventions and supports the need for further documentation to better understand the underlying mechanisms.

Keywords: adverse drug reaction; fentanyl; ketamine; visual disturbance; blurred vision

Introduction

An adverse drug reaction (ADR) is defined by the World Health Organization as “a response to a medicinal product which is noxious and unintended, and which occurs at doses normally used in humans for the prophylaxis, diagnosis or therapy of disease, or for the modification of physiological function” [1]. ADRs not only impact patients' quality of life but also increase the burden on the healthcare system. Their elevated mortality and morbidity make them a major public health concern [2]. Fentanyl and ketamine are commonly used analgesics in acute care settings [3]. Ketamine, a noncompetitive N-methyl-D-aspartate (NMDA) receptor antagonist, is often employed for its analgesic, dissociative, and amnestic properties either singly or in combination with other medications. It is utilized primarily for skeletal muscle relaxation and also used as a pre-anesthetic medication for induction of general anesthesia [4].

Fentanyl, a potent synthetic opioid, produces a strong analgesic effect. It acts primarily on the μ -opioid receptor and is widely favored for its rapid onset and short duration of action. Fentanyl usually has 50–100 times the potency of morphine. It has been observed that 100 microgrammes of morphine can provide

analgesia comparable to about 10 mg of the drug. However, the pharmacokinetics and characteristics of fentanyl are very different. Because of its mostly hepatic clearance, it is most commonly used clinically as a sedative in intubated patients and in cases of extreme discomfort in patients with renal failure [5]. The most common ADRs associated with ketamine use are non-specific symptoms such as nausea, vomiting and dizziness. The ophthalmological ADRs include diplopia, nystagmus and intraocular pressure [6]. Fentanyl ADRs are similar to that of morphine which produces euphoria, respiratory depression, confusion, nausea and drowsiness. Both are generally well tolerated, though their central nervous system effects may occasionally lead to less common reactions, including perceptual disturbances [6,7]. Visual disturbances especially unilateral blurring is extremely rare. According to vigiaccess database, there are only few reported cases of transient unilateral blurred vision [8]. Considering very few ophthalmological ADRs associated with the drugs, this case is worth reporting.

Case Presentation

A 27-year-old primigravida at 32 weeks and 3 days of gestation presented to the emergency department

with complaints of severe upper abdominal pain, nausea, and vomiting. She had a known history of β -thalassemia trait but no prior history of hypertension, diabetes, or visual disturbances. On evaluation, her clinical findings and laboratory investigations were consistent with acute pancreatitis, likely of idiopathic or gestational etiology, given the absence of gallstones, alcohol use, or hypertriglyceridemia. Due to the intensity of her abdominal pain and concerns about the potential effects of pain and stress on both maternal and fetal well-being, a decision was made to initiate intravenous analgesia. Fentanyl and ketamine were administered intravenously at a rate of 1 ml/hour under continuous maternal and fetal monitoring, as per acute care pain protocols in obstetric settings.

A few hours after initiation of the infusion, the patient developed sudden-onset blurred vision in the right eye. She denied any associated symptoms such as eye pain, photophobia, headache, vomiting, or altered sensorium. Her vital signs remained stable, with no evidence of hypertension or neurological deterioration. A detailed neurological and ophthalmological examination revealed no focal deficits. Pupillary size and light reactions were normal and symmetric bilaterally. Ocular movements were intact and there was no ptosis or proptosis. Fundoscopic examination did not reveal any papilledema or retinal pathology. Given the temporal association with the administration of fentanyl and ketamine, both medications were immediately discontinued. The patient was managed conservatively with supportive care, including lubricating eye drops (artificial tears), rest, and close observation. Over the course of the next 72 hours, her visual symptoms gradually resolved completely without any need for further pharmacologic or surgical intervention.

The Naranjo Adverse Drug Reaction Probability Scale yielded a score of 6, suggesting a probable link between ketamine and fentanyl and the observed adverse event of transient unilateral vision loss. The Naranjo probability scale is a validated, structured tool used to assess the likelihood that a specific drug caused an adverse reaction. It consists of 10 questions, each assigned a score of -1, 0, +1, or +2 based on the answers: "Yes," "No," or "Do not know." The total score helps categorize the causality as: definite (≥ 9), probable (5–8), possible (1–4), or doubtful (≤ 0). Overall scores can range from -4 to +13, reflecting the strength of the evidence supporting drug-related

causation.

Discussion

In Ophthalmology blurred vision is one of the most common clinical complaints and can hamper one's quality of life. The reason is manifold such as refractive errors, lens disorders, corneal disorders and retinal pathology. However, there are various medications which are also responsible for blurred vision. These include certain classes of drugs such as anti-cholinergics, anti-hypertensive, anti-histaminics and certain anti-cancers. Further research is necessary to clarify the underlying mechanisms and develop appropriate management options because the impaired vision caused by these medicines frequently has a delayed beginning and a prolonged, insidious progression [10].

Although ketamine and fentanyl are commonly used for analgesia in both obstetric and acute care settings, visual side effects following their use remain uncommon [6, 7]. Despite not being frequently associated with visual side effects on its own, fentanyl's sedative and central nervous system depressive qualities may intensify ketamine's effects [11]. The body's reaction to medicines like ketamine and fentanyl can be greatly impacted by a number of physiological changes that occur during pregnancy, including increased plasma volume, changed protein binding, and enhanced cerebral sensitivity to particular drugs. These elements could lead to unforeseen reactions even at typical dosages [12] As already discussed, Ketamine blocks NMDA receptors in brain, thereby altering glutamatergic neurotransmission, hence disrupting cortical and subcortical circuits involved in visual perception. This results in disorders of visual field and is one of the primary hypotheses of occurrence of blurred vision in patients exposed to Ketamine [13]. Fentanyl being a central nervous system depressant affects regions that governs visual perception, thereby leading to blurred vision. This is the primary hypothesis of fentanyl causing blurred vision [14].

Unilateral blurred vision is particularly rare and not widely documented in association with these drugs. In this case, the lack of any prior history of similar symptoms, no evidence of structural or ocular abnormalities, and the fact that the symptoms were self-limiting all support a drug-induced mechanism as the most likely explanation.

Conclusion

Blurred vision is a rare but noteworthy adverse drug reaction associated with ketamine and fentanyl, particularly when used in combination. This case highlights the importance of considering drug-induced causes in patients presenting with acute visual disturbances, even when routine clinical and ophthalmological evaluations are unremarkable. Awareness of such uncommon ADRs can aid in timely recognition, appropriate management, and avoidance of unnecessary investigations. Further documentation of similar cases will strengthen the understanding of their underlying mechanisms and clinical relevance.

Declarations

Declaration of Patient Consent

Informed consent was obtained from the patient for publication of this case report. All identifying information has been removed to maintain confidentiality.

Conflict of Interest

No conflicts of interest.

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Nil

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