

Emergence Agitation with Earthquake-Related Traumatic Stress Symptoms After Intravenous Sedation



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ABSTRACT

Sedation with intravenous anesthetics is a sedation method that is often preferred during minor surgical procedures for anxious patients. Among the anesthetic agents used are drugs such as midazolam and ketamine, which can cause psychiatric symptoms such as loss of control over the behavior of the person (disinhibition) or dissociation. In people with high anxiety levels, a paradoxical rise of anxiety may rarely occur with midazolam, and emergence agitation or delirium may occur after anesthesia with ketamine. Post-traumatic stress disorder is a known risk factor for emergence agitation. Accompanying traumatic stress symptoms are reported to have persisted for a long time in the case reports of emergence agitation with a past history of trauma. It is aimed to discuss the importance of traumatic stress symptoms in sedation management in the post-earthquake period by presenting a case with increased anxiety and emergence agitation with acute stress symptoms such as re-experiencing the earthquake after sedation with intravenous anesthetics for a local surgical procedure immediately after experiencing the Kahramanmaraş earthquake on February 6 in Turkey.

Keywords: Earthquakes, intravenous anesthetics, emergence, psychomotor agitation, acute stress disorder, post traumatic stress disorder, post-traumatic stress disorder

INTRODUCTION

In terms of the rapid onset of effect and easy regulation of sedative depth, intravenous anesthetic sedation is the most utilized procedure among the sedation techniques. Fentanyl and midazolam are two agents with different mechanisms of action that are frequently combined for intravenous (IV) administration to induce sedation. Midazolam is a short-acting benzodiazepine that causes powerful amnesia and has sedative and hypnotic properties, while fentanyl is an opioid analgesic (Saiso et al. 2017). Ketamine is a safe and effective sedative agent for painful procedures. Ketamine is preferred for its rapid onset of action, quick recovery time, analgesic and amnesia-inducing properties, however delirium, unpleasant dreams, excitation, and hallucinations during recovery can be major drawbacks. Emergence agitation can be seen in up to 30% of ketamine administrations (Azizkhani et al. 2021).

In this article, we present the case of a patient who was given IV midazolam and ketamine one week after the earthquake

without realizing his exposure to the disaster and exhibited re-experiencing symptoms, intense fear of losing his family, and psychomotor agitation. The choice of appropriate anesthetic medications in the early post-traumatic period will be discussed.

CASE

A 45-year-old man experienced the 7.7-magnitude earthquake in Kahramanmaraş with his wife and two children in their home in one of the adjacent provinces. During the severe earthquake, they all managed to leave their home, which was later discovered to be moderately damaged. None of their family members were hurt. The following day, they left the epicenter and reached Ankara, where their friends and relatives were living. Due to the damage on the road, the drive took much longer than anticipated.

After this trip, the tenderness and intermittent discomfort he had been experiencing around the anus became constant and

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worsened over the following days. A week after the earthquake, he was subsequently checked out in the Department of General Surgery. Pilonidal sinus and abscess were identified to be the causes, and abscess drainage was recommended. Although the procedure was scheduled to be performed under the conditions of the outpatient clinic, the patient requested that it be performed under general anesthesia because he was having difficulty tolerating the pain and was too nervous. Then the Anesthesiology and Reanimation Department was consulted for the application of sedation.

The risk of sedation-related complications was determined to be low by the Anesthesiology and Reanimation Department, based on the patient's overall health status assessment and physical examination. The patient had no prior surgery or anesthetic history. Since it was not part of the standard evaluation, neither the information regarding the patient's residence nor whether he was impacted by the earthquake was collected. The treatment was intended to be carried out under sedation with the patient's consent. The staff noticed that he was anxious when he entered the operating room and was distressed by severe pain in the perianal region. After calming him down verbally, surgery preparations began. Midazolam 2 mg was administered intravenously. The patient then reported feeling lightheaded and described it as feeling "as if he had drunk". When the surgical team began administering the local anesthetic, the patient said he could not tolerate the pain. Fentanyl 50 µg was consequently administered intravenously. However, the patient's agony prevented him from allowing the local anesthetic to be administered. To intensify the sedation, midazolam 1 mg, fentanyl 25 µg, and ketamine 50 mg IV were administered. After calming down for about five minutes, the patient started to speak incoherently and kept repeating that he was in pain. Noticing he was uncomfortable, he was given 50 mg of propofol IV. The procedure was performed with spontaneous respiration and vital signs at normal ranges.

Following the surgery, the patient was positioned on a stretcher in the supine position. When he awoke, he shouted "There is an earthquake; my wife is under the rubble", and it was noted that his psychomotor activity had increased. For an additional 8 to 10 minutes, the patient was agitated and made claims about an earthquake, being buried by rubble, and that his wife and children were under the rubble. He was then given 50 mg of propofol IV and allowed to sleep once again in the recovery unit. Then, the patient was transferred to an inpatient treatment room with his wife, and his wife was informed of his status. He was allowed to wake up with his wife by his bedside. The patient who saw his wife stated that his children were under the rubble and he did not believe that they were healthy and that they were not under the rubble. He shouted and cried, asking, "We are trembling, where are my children?" The treatment team

learned for the first time that the patient had suffered the recent Kahramanmaraş earthquake as a result of the agitation, which led to an interview with his wife. It was believed that the use of midazolam might have been responsible for the ongoing agitation. Approximately 40 minutes after taking midazolam, the patient kept displaying incoherent speech and increased psychomotor activity. Flumazenil was administered intravenously in the amount of 0.2 mg, and after five minutes, despite being calmer, the patient kept asking where his children were. An additional 0.1 mg of flumazenil was administered. He relaxed and stopped asking questions ten minutes after receiving flumazenil. After an hour, when the patient was prepared to be discharged, he said that he couldn't recall what happened during this process.

The Department of Anesthesiology and Reanimation referred the patient to the Department of Psychiatry after learning that he had traveled from the earthquake center. In the evaluation of the Department of Psychiatry, it was learned that the patient was staying at his mother's house with his wife and children. He was intending to reconsider whether they would return to the city where they currently reside and continue their work there or migrate to Ankara after his medical condition improved. No close relatives had died in the earthquake, but numerous friends and colleagues of theirs had. He stated that they have access to social and familial support.

He has been consuming two glasses of wine or beer every two days while smoking a pack of cigarettes every day for 25 years. There was no prior history of psychiatric disorders, no history of psychiatric treatment, and no family history of psychiatric disorders. The patient was only taking antibiotics at the time, and he was able to adjust to receiving antibiotics. He mentioned witnessing a fire, being in a car accident once, and being physically assaulted once when asked about past traumatic life events that may have increased his tendency to develop traumatic stress symptoms. The patient denied having signs of acute stress disorder, post-traumatic stress disorder, or a dissociative experience as a result of these experiences, and he also denied having any ongoing psychiatric complaints connected to them.

When the potential psychiatric symptoms that may be experienced after the earthquake were examined, it was discovered that the patient had been having intrusive memories and flashbacks of the event, had been experiencing intense emotional swings regarding what had occurred, and had been experiencing mild physical reactions like heart palpitations in response to things that reminded him of the event. He received a score of 23/88 on the Impact of Events Scale, which consists of 22 questions scored from 0 to 4 and was developed to assess the intensity of traumatic stress symptoms in individuals who have had any kind of psychological trauma (Çorapçıoğlu et al. 2006). He stated that he had not been

experiencing any avoidance symptoms. Except for a slight desire to cry, indecisiveness, sleeplessness, and a low appetite, he had no other depression symptoms. He received a 5/63 on the Beck Depression Inventory (Hisli 1988). There was no prior history of predisposition to dissociation. The intensity of somatic dissociation symptoms was assessed using the 20-item, five-point Likert-type Somatoform Dissociation Scale (Nijenhuis et al. 1996, Şar et al. 1998). It was discovered that the patient, who had a Somatoform Dissociation Scale score of 21/100, had not currently been exhibiting somatization or dissociation symptoms. In the previous week, he had had no obvious signs of anxiety [Beck Anxiety Inventory score: 3/84 (Ulusoy et al. 1998)].

The symptoms he experienced were evaluated as an acute stress response. The patient was informed that he had been experiencing some expected symptoms after the earthquake and that he and other family members could apply to the psychiatry clinic whenever needed. The patient's consent was obtained for the case report. Possible psychiatric risk factors in the preoperative evaluation and the role of acute stress responses in anesthesia management were discussed with the Anesthesiology and Reanimation Department.

DISCUSSION

The case of a patient with IV anesthetics administered one week after the earthquake exhibiting symptoms such as re-experiencing the earthquake, anxiety and fear about what may be experienced in the post-earthquake period, and psychomotor agitation during recovery after sedation is presented. No study has been found in the literature on psychiatric complications due to the anesthesia performed shortly after mass traumas or disasters such as earthquakes. Sedation should be avoided whenever possible during times when acute stress reactions may occur. It's also important to avoid using midazolam and ketamine in intravenous sedation procedures as much as possible in these conditions and to be ready for the potential of emergence agitation or paradoxical increase in anxiety should it be necessary.

Despite the lack of research, cases have been described in which post-traumatic stress disorder may be a significant risk factor for emergence agitation or delirium. (Huang et al. 2023). There are previous case reports in the literature with long-lasting post-traumatic stress disorder symptoms when retrospective risk factors are asked, or cases where measures were taken in terms of emergence agitation after learning that they had been diagnosed with post-traumatic stress disorder (Lovestrand et al. 2013, Shoum 2014, Huang et al. 2023). These cases highlight the significance of investigating previous anesthetic procedures as well as previous psychological trauma and associated psychiatric symptoms in the pre-anesthesia examination. In these case

reports of emergence agitation, it is detected that traumatic life events occurred a long time ago and that the symptoms of ongoing traumatic stress persisted. The presented case differs from other reported cases in terms of both the occurrence of emergence agitation despite the absence of externally apparent psychiatric symptoms before anesthesia and the clinical appearance of emergence agitation with acute stress symptoms as a result of anesthesia given immediately after a very recent trauma.

Emergence agitation is a state that appears early in the recovery phase from anesthesia and is characterized by symptoms of restlessness, confusion, excitation, inability to calm down, an affinity for aggression, and incoherent speech (Lee and Sung 2020). In this case, acute stress symptoms such as re-experiencing the earthquake, fear of being buried under rubble, and worrying about the loss of loved ones also manifested in addition to the emergence agitation symptoms. A case where emergence agitation was accompanied by acute stress symptoms has never been documented before.

It has been shown that IV midazolam sedation frequently reduces anxiety in people with high anxiety levels prior to operations like dental procedures where increased anxiety is prevalent, but it can also, albeit less frequently, lead to disinhibition or paradoxical anxiety (Wilson et al. 2011). In addition, it has been demonstrated that midazolam increases traumatic stress symptoms in pediatric patients following intensive care unit admission, despite the fact that there is insufficient data for adults addressing the long-term safety of midazolam regarding the development or maintenance of traumatic stress symptoms (Long et al. 2022). In addition, due to the possibility of disinhibition and the long-term persistence of traumatic stress symptoms, other benzodiazepines used in psychiatry practice are not recommended for use in the early post-traumatic period (Morgan et al. 2003, Yildiz et al. 2023). These findings indicate that the use of midazolam in trauma experiences should be approached with caution. Also, there is no evidence to support the use of ketamine in the early post-traumatic period, and it is known as an agent that promotes dissociative amnesia. Although it has been claimed that midazolam administration lessens the intensity of emergence agitation following ketamine administration (Somashekara et al. 2010), it has also been reported that both medications may have adverse effects on behavioral control in high-risk patients (Wilson et al. 2011, Azizkhani et al. 2021). In terms of behavioral control and agitation, it can be assumed that using propofol for sedation in this population would be relatively safe (Garcia et al. 2021). Contradictory results have been reported regarding the impact of propofol on the emergence and maintenance of long-term post-traumatic stress disorder symptoms (Vogt and Pryor 2022). On the other hand, due to their potential to decrease fear conditioning, opioids like

fentanyl appear to be appropriate for use, despite insufficient evidence (Vogt and Pryor 2022).

When the literature is reviewed, there is no standard protocol for preventing or treating emergence agitation. However, healthcare professionals generally agree that the patient should recover in a calm setting, be with a trusted relative, and be reminded periodically to maintain orientation. Additionally, despite the fact that the expert opinion highlights the risks associated with utilizing benzodiazepine group medications, including midazolam, it is known that midazolam is frequently used to reduce preoperative anxiety (Lovestrand et al. 2013, Shoum 2014, Huang et al. 2023). Although not used in the presented case, case reports are available suggesting that the administration of dexmedetomidine, an alpha-2 receptor agonist, before general anesthesia may be beneficial in patients whose post-traumatic stress disorder symptoms persist while planning the anesthesia and are at risk for emergence agitation and delirium. However, the effectiveness of dexmedetomidine may be impaired due to alpha-2 receptor antagonism if mirtazapine is used (Huang et al. 2023).

Given that acute stress symptoms may be present and increase the susceptibility to dissociative reactions in the post-earthquake period, learning whether there are stressful life events in the recent history of the individuals, whether they have traumatic stress symptoms, and determining their anxiety levels in the pre-procedure evaluation may guide the selection of agents to be used for sedation. This case indicates that even in cases where traumatic stress symptoms are not reported by the patient and are not externally detectable, being prepared for the possibility of emergence agitation in the presence of recent stressful life events is necessary to prevent possible negative consequences during and after the procedure. After large-scale disasters like earthquakes, it seems crucial to carefully consider these issues, avoid using midazolam and ketamine as much as possible, take into account the possibility of psychological trauma exposure if it cannot be thoroughly examined, and take precautions against agitation.

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