Effectiveness of lorazepam-assisted interviews in an adolescent with dissociative amnesia

A case report

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Abstract
To facilitate gathering information during a psychiatric interview, some psychiatrists advocate augmenting the interview using drugs. Rather than barbiturates, benzodiazepines have been used for drug-assisted interviews. Dissociative amnesia is one of the indications for these interviews. Herein, we present the case of a 15-year-old female who was diagnosed as having dissociative amnesia because of conflicts with her friends. She was administered a lorazepam-assisted interview to aid recovery of her memories. In this case, a small dose of lorazepam was sufficient to recover her memories without any adverse effects.

Key Words
neural regeneration; clinical practice; dissociative amnesia; dissociative disorder; dissociation; drug-assisted interview; amobarbital, lorazepam; benzodiazepine; adolescent; memory loss; emotional distress; distress; grant-supported paper; neuroregeneration

Research Highlights
(1) Drug-assisted interview is a method used in the diagnosis and treatment of psychiatric disorders. Barbiturates are conventionally used for drug-assisted interview. Rather than barbiturates, benzodiazepines have been recently used for drug-assisted interviews, because of their better safety profiles.
(2) We present a case of successful treatment of a 15-year-old female with dissociative amnesia using a lorazepam-assisted interview.
(3) A small amount of lorazepam was enough to recover her memory without any adverse effects.

INTRODUCTION
Dissociation is considered a defensive biological response to emergencies, a "shut-off mechanism" against severe emotional distress and excessive anxiety. Dissociative disorders include dissociative amnesia, dissociative fugue, dissociative identity disorder, depersonalization disorder, and dissociative disorder not otherwise specified. Dissociative amnesia is defined as an inability to recall important autobiographical information, usually of a traumatic or stressful nature, that is too extensive to be explained by normal forgetfulness. Such disturbances to memory do not occur exclusively during the course of dissociative identity disorder, dissociative fugue, posttraumatic stress disorder,
acute stress disorder, or somatization disorder, and do not result from the direct physiological effects of a substance, neurological disorder, or general medical conditions[4].

There are multiple treatment methods for dissociative amnesia, such as cognitive therapy, hypnosis, somatic therapy, and group psychotherapy[4-6]. However, these treatments mostly focus on memory retrieval. Psychotherapeutic techniques have also been used for memory retrieval. If these approaches fail, however, interviews using drugs such as thiopental and amobarbital are often used for therapy[7-8]. Interviews with these drugs can facilitate recall of memories and promote integration of dissociative materials or events[9].

Herman[9] conducted the first drug-assisted interviews in patients with psychogenic amnesia. He reported six subjects experienced successful restoration of their memories during interviewed conducted with intravenous administration of amobarbital. Sagant and Slater[10] widely used drug-assisted interviews in the treatment of acute war neuroses and reported that amobarbital was more effective agents or traditional hypnosis than other agents or traditional hypnosis for memory retrieval. Lambert and Rees[11] reported that barbiturate-assisted interviews were an effective method of recovering memory in hysterical amnesia.

It is clear that amobarbital-assisted interviews are clinically helpful in the diagnosis and treatment of dissociative disorders. However, this technique reduced use since the 1960s because of barbiturate dependence and the emergence of chlorpromazine and tricyclics in psychiatry[12]. As safer alternatives, benzodiazepines are the preferred treatment option, because they have a wider therapeutic index compared to barbiturates, such as amobarbital, and flumazenil (γ-aminobutyric acid receptor antagonist) can reverse some symptoms of benzodiazepines[13]. However, there have been few case reports of interviews in patients with mental illnesses that were assisted by benzodiazepines, such as diazepam[8], lorazepam[14-15], and midazolam[16]. In this case report, we present the successful treatment of a patient with dissociative amnesia using lorazepam.

**CASE REPORT**

A 15-year-old, female high school student was referred to our child and adolescent psychiatric department for sudden loss of memory during a high-school extracurricular activity. She did not have any previous psychiatric problems. There were no abnormalities in her laboratory results, including a chest X-ray, brain magnetic resonance imaging scan, HIV test, liver function test, vitamin B12 assay, and electrolyte level test. She did not have abnormal behavior or psychotic symptoms, including hallucinations and delusions. She did not exhibit cognitive problems on a mini-mental status examination, except she could not recall the other participants of her extracurricular activity, even after looking at their pictures and phone numbers. She was embarrassed at the memory loss, but she was neither worried nor agonized. She reported that she had not experienced physical or emotional trauma or severe stress. Through the interviews with her family and friends, we determined that she had experienced difficult social relationships for the previous month. According to her family, she was usually timid and extremely vulnerable, and such characteristics prevented her from getting along with more than a few close friends. Nevertheless, her interest in musical instruments led her to join a brass band and to enjoy playing alto saxophone in the band. According to the band members, the vice-chief wind player assigned to the baritone saxophone had complimented her performance. However, the patient felt left out and had started playing louder and trying harder in the band. The vice-chief was displeased with her behavior, and began to disparage the patient to other people. She cowered before the vice-chief and avoided confronting him. The vice-chief, however, kept disparaging her, and the patient had to endure hardships as the practice hours became longer and more frequent during a break. When the patient broke her commitment to meet the vice-chief, the vice-chief bawled at her on the phone. The patient experienced headaches afterwards, which became more severe and frequent. After 3 days, however, the patient claimed that she no longer suffered from any headaches. Moreover, when her friends in the brass band called her for practice, the patient was embarrassed and could not recall anything about the band activity or the members of the band.

Her initial diagnosis was dissociative amnesia. The patient became anxious and tried to avoid conversations regarding the band activities when a supportive interview for memory retrieval was administered. She was educated about her disorder, and it was suggested that her memory could return. However, her memory did not recover. Therefore, we decided to use drug-assisted
After 3 days of hospitalization, a lorazepam-assisted interview was planned, and the patient gave her consent. The interview with lorazepam was conducted according to a previously described protocol\cite{10-11, 15}, described in Table 1.

Before obtaining informed consent, the procedure was prepared, with a brief explanation of the means by which the procedure could help her memory recover. The patient was maintained on an intravenous drip of 500 mL of 5% dextrose. We dissolved 4 mg of lorazepam (Ildong pharmaceutical Co., Ltd., Seoul) in 30 mL of normal saline. Monitoring of her vital signs, including her blood oxygen saturation, was conducted.

After 10 mL of diluted lorazepam (1.25 mg of lorazepam) solution was intravenously injected, the patient became relaxed and sleepy. She was kept awake by gently calling her name and asking her simple questions. The interview was started with ordinary questions that gradually transitioned to the topics of her memory loss. A few minutes later, she started to report having been bullied by members of the band. She recalled that she had been insulted by a member on a phone call. When she became infuriated and tearful, an additional 5 mL of lorazepam solution (0.625 mg of lorazepam) was administered. As she was too unstable emotionally to continue the interview and could not recall the details of the phone call even after half an hour, the interview was halted. The next day, the patient could recall that she had cried during the lorazepam-assisted interview. However, she could not remember any experiences with other members of the band, and she reported anxiety regarding recall of such experiences. An additional 0.25 mg of lorazepam was administered in the next interview. Supportive psychotherapy to provide reassurance and suggestions was performed until the second lorazepam-assisted interview. After she had been hospitalized for 10 days, the second lorazepam-assisted interview was conducted. The same procedures were used. During the second interview, she successfully recalled a phone conversation with three friends in which she blamed herself for not reporting the bullying. The day after, she could recall that her relationships with peers and more senior members of the band had been stressful. As soon as she remembered that her best friend had blamed her, she was disappointed and angry because she could not resolve the misunderstanding. She then recalled most of the events related to her memory loss and decided to accept further psychotherapy.

A final diagnosis of dissociative amnesia\cite{3} was made, and she was discharged after 14 days of hospitalization. One week later, she was getting along well without any memory or cognitive problems.

### Table 1 Protocol used for the lorazepam-assisted interview

| Preparation | (1) Obtaining informed consent.  
|             | (2) Explanation of the mechanism on the procedure and reassurance that it could help her memory recovery.  
|             | (3) The patient was asked to lie in a reclining position and maintained on an intravenous drip of 500 mL of 5% dextrose.  
|             | (4) Pulse oximetry instrument, electrocardiogram machine, and intubation kit were prepared.  
|             | (5) Preparation of lorazepam solution (4 mg of lorazepam in 30 mL of normal saline).  |
| Procedure   | ECG, pulse oximetry, and vital signs are monitored.  
|             | **Induction of hypnosis**  
|             | (1) Diluted lorazepam solution was slowly administered intravenously at 0.05 mg/min until the patient exhibited mild drowsiness and lateral nystagmus.  
|             | (2) Gently call the patient’s name and ask simple questions to check the patient was awake.  
|             | (3) Not exceed 4 mg of lorazepam for induction.  
|             | **Maintenance of hypnosis**  
|             | (1) During the interview, lorazepam was slowly administered intravenously at a dose range from 0.05 mg/min to 0.075 mg/min.  
|             | (2) The patient was monitored for relaxation and sleepiness and she was encouraged to engage with the interview continuously.  
|             | (3) Interview was started with nonspecific question and then approached to specific questions related with suppressed event or trauma.  
|             | (4) Gave some suggestions to the patient to answer the questions.  
|             | (5) Lorazepam administration was stopped, if the oxygen saturation dropped below 85%.  
|             | (6) If the patient was oversedated or respiratory depressed, 0.1 mg flumazenil was immediately injected intravenously.  
|             | **Closing of the interview**  
|             | At the end of the interview, the concentration of lorazepam (0.25 mg) was decreased to less than 0.05 mg/min and the administration at this concentration was maintained for 15 minutes.  
|             | **Termination**  
|             | Kept the patient lying and there was a close monitoring till she could walk well. |
DISCUSSION

Barbiturate-assisted interviews have been used for more than 70 years in psychology as both diagnostic and therapeutic tools. Amobarbital-assisted interviews were first introduced in 1930 by Bleckwenn, as a treatment for catatonic schizophrenia\textsuperscript{[17]}. Amobarbital-assisted interview were applied to non-psychiatric patients by Lindermann in 1932\textsuperscript{[18]}. In the early 1950s, extensive studies on amobarbital-assisted interviews were performed using the terms narcoanalysis, narcoticsynthesis, narcosuggestion, and narcocatharsis\textsuperscript{[19]}. Amobarbital-assisted interviews were used to treat neurosis patients following the Korean War in 1952. Although amobarbital-assisted interviews gave problems, the clinical application of these interviews is warranted in patients with psychiatric emergencies\textsuperscript{[2, 7]}

According to previous studies of drug-assisted interviews, the patient-physician relationship greatly affects the prognosis. In addition, improvements in the patient’s symptoms are not completely determined by negative affect and depression during the drug-assisted interview\textsuperscript{[20]}. The agent used during the interview works like a chemical buffer against negative emotions. It allows the patients to talk about unpleasant or stressful experiences, and helps to relate current symptoms to psychological stressors and conflicts\textsuperscript{[21]}

Amobarbital-assisted interviews can be clinically used in the diagnosis of mute patient or patients with a stupor, such as those with catatonia, hysterical stupor, unexplained muteness, and differentiating depressive, schizophrenic, and organic stupors. It can also be used in therapeutic interviews for dissociative disorders, such as abreaction of post-traumatic stress disorder, recovery of memory in psychogenic amnesia and fugue, and recovery of function in conversion\textsuperscript{[7, 21-22]}. However, if the patient strongly refuses the treatment or is afraid of revealing relevant information, the drug-assisted interview should not be applied. Also, clinical contraindications include upper respiratory disorders, severe liver or kidney disease, history of hypotension or porphyria, and barbiturate addiction\textsuperscript{[21]}

Before the drug-assisted interview begins, the objectives and procedures of the interview should be explained to the patient and accompanying family members. Likewise, the importance of answering the questions should be emphasized. They should neither anticipate an unreasonably robust response nor be afraid of the treatment. To start the interview, the patient is typically asked to lie down and reassured by receiving an explanation of the procedure. A 5% sodium amobarbital solution (500 mg of amobarbital diluted in 100 mL of normal saline) is slowly administered intravenously until the patient exhibits nystagmus or sleepiness. Amobarbital is given every 5 minutes to maintain effectiveness\textsuperscript{[19]}. The interview starts with ordinary matters and slowly transitions to the questions regarding the trauma, a guilty conscience, and suppressed events. For a mute patient, subjects related with the patient’s life are already known can be chosen with the prediction that the patient will be able to talk soon. Amobarbital interview is not much different from other psychiatric interviews, but it should proceed slowly, especially when the questions begin to elicit memories of emotionally traumatic or stressful events. For most cases, these interviews require 30 minutes and should be ended when sufficient information has been obtained. For at least 15 minutes after termination of the amobarbital administration, the patient is kept in a lying position and monitored until he or she can walk alone\textsuperscript{[7, 19]}

In recent years, benzodiazepines have been begun to replace amobarbital for drug-assisted interviews\textsuperscript{[13]}. However, to the best of our knowledge, there are only two reports on the use of lorazepam-assisted interviews in psychiatry\textsuperscript{[14-15]}. Ilechukwu et al\textsuperscript{[14]} described a modified amobarbital interview used in middle-aged white women with dissociative amnesia. In this report, 6 mg lorazepam diluted with normal saline was administered until the subjects showed relaxation and sedation. They recommended that lorazepam should not be administered over 2 mg/min, no more than 4 mg lorazepam should be used in the preparation stage of the interview, and up to a total dose of 4 mg can be additionally given after 10–15 minutes if sedation does not occur. Lee et al\textsuperscript{[15]} administered lorazepam solution (10 mg of lorazepam diluted in 300 mL of normal saline) for 60 minutes (0.05–0.1 mg/min) in individuals with dissociative amnesia who were 17–18 years of age. However, in that report, the lorazepam-assisted interview was used after failed treatments with antidepressants (paroxetine 20 mg/day or fluoxetine 20 mg per day) and an anxiolytic (alprazolam 0.5–1.5 mg per day), which were also used during drug-assisted interview. In the present case report, we used lorazepam-assisted interviews to treat a 15-year-old girl with dissociative amnesia successfully. To the best of our knowledge, this report describes the youngest person reported to have undergone lorazepam-assisted interviews and the smallest amount of lorazepam (2.125 mg of lorazepam)}
used in such interviews without concurrent treatment with other psychiatric drugs\textsuperscript{[14]-[15]}.

A limitation of this case study is that the interviews were conducted by two different examiners with different interview styles. Future studies should consider this issue and whether interview gains can be consolidated, particularly through video-recording the interview.

**Author contributions:** Ji-Hoon Kim designed the study. Yuna Seo, Mi-Hee Shin, and Sung-Gon Kim performed the study. Yuna Seo wrote the manuscript. All authors approved the final version of the manuscript.

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