

Synergism between Methamphetamine and Alcohol in a Case of Methamphetamine Psychosis

SHINICHIRO HARAJIRI*†, HIDEKI KOJIMA*, KATSUYOSHI ARIKAWA†,
CHISHIN MIURA† and KAZUTOYO INANAGA*

**Department of Neuropsychiatry, Kurume University School of Medicine, 830
and †Chikusuikai Hospital, Yame, 834 Japan*

Received for publication September 17, 1986

Summary: The case of a 25-year-old male with methamphetamine dependence indicating the presence of synergism between methamphetamine and alcohol was reported. The three clinical features observed in the present case were: First, ingesting large quantities of alcohol after an intravenous injection of the psychostimulant induced psychomotor excitement, indicating that alcohol itself could potentiate the psychosis-inducing action of the psychostimulant. Second, repetition of the alcohol intake without the drug injection reactivated a psychotic state, suggesting that there is a cross-reverse tolerance phenomenon to alcohol. Third, drug injection alone, twice aggravated the psychiatric symptoms, indicating the presence of reverse tolerance to the psychostimulant.

Key words: methamphetamine — alcohol — reverse tolerance — psychostimulant — cross reverse tolerance

Introduction

It has been reported that there is a synergism between alcohol and amphetamines (Weiss et al. 1964) and between amylobarbitone (pharmacologically similar to alcohol) and amphetamine sulfate (Rushton et al. 1964) in animal experiments. Therefore, it is necessary to establish how the combination of amphetamine and alcohol interacts to modify psychiatric symptoms, such as hallucinations and delusions, which can be induced by chronic administration of stimulants in human subjects. Clinical studies on the interactions of amphetamines and alcohol are rare (Kipperman et al. 1974). A case of methamphetamine dependence displaying between methamphetamine and alcohol is described.

Case

Case T.I. is a 25-year-old male.

Chief Complaints:

Odd talking and behavior were occurring with affective and sleep disturbances.

Family History:

His father died of asthma at the age of 47. There is familial tendency for mental disorders.

Past History:

T.I. suffered from cardiac valve disease with endocarditis due to sepsis at the age of 23, and a heart operation.

Living Situation:

T.I. is the youngest of three children. His delivery and development were nor-

mal. His parents were very lenient with him. He never got into trouble, although he slept with his mother until he was 12 years old. The school records throughout his compulsory education were average. He gave up his high school education at the age of 16, for personal reasons, and he has since worked in several shops.

Premorbid Character:

He is selfish and tends to be timid and reserved.

Present Illness:

It was clarified that T.I. had once injected a small amount of the psychostimulant, methamphetamine hydrochloride (approx. 10 mg) intravenously, at 19, because of his interest in the drug, he had no chance to use the drug for another year. After he became 20 years old, he injected the drug (10-30 mg a day) about once a week especially when he was emotionally labile (cf. Fig. 1). At age 23 to 24, irritability and dysphoria during withdrawal, and insomnia and perception disturbances (illusion) immediately after the drug injection (approx. 10 mg) were noticed. When he and his girl friend decided not to go steady in March, 1984, he began to drink alcohol (60-70 ml a day) regularly. As shown in Fig. 1, in July, 1984, the patient ingested a large quantity of alcohol

(approx. 60 ml) after an intravenous injection of the psychostimulant (approx. 10 mg) and displayed psychomotor excitement with self-mutilation (wrist cutting with a razor). He was admitted to a mental hospital for one month. At the time, he was clearly aware of the nature of his surroundings; therefore his sensorium appeared to be clear. He began to drink large amounts of alcohol (60-70 ml a day) after being discharged from the hospital. After ingesting alcohol in September, 1984, he had an auditory hallucination involving a woman saying "Help". He responded "I am sorry. I was wrong," while sitting in front of the window. He began to frequently state, after ingesting alcohol, that there must be a man on the ceiling because there are sounds of a fluorescent lamp, rain and tap water (see the arrow in Fig. 1). There was no recent memory impairment, no disorientation and no confabulation.

He obtained a job as a gardener on October 4, 1984, but often did not go to work. He complained of depression and often made mistakes at work. On October 27, the monologue and auditory hallucination persisted after he injected methamphetamine (approx. 10 mg), intravenously. On October 31, the sound of tap water appeared to make him angry. He said, with a terrible-facial expression, "Get out"

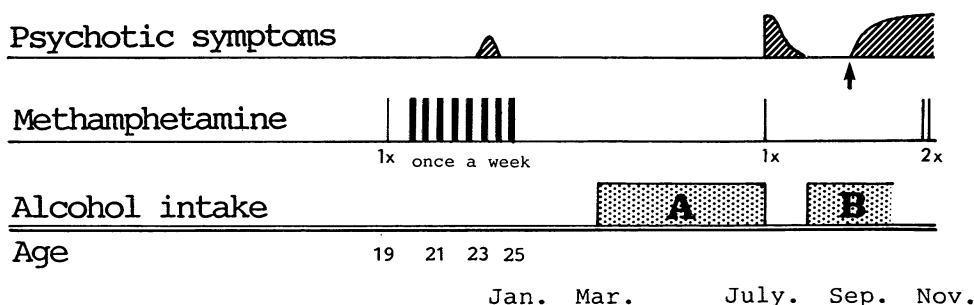


Fig. 1. A figure showing the relationship between the development of psychotic symptoms, and methamphetamine and alcohol administration.

to his sister. On that day, he set his house on fire, was brought to the police station and then was admitted by force to the hospital. Amnesia for the episode did not occur.

Present Status:

General State: His nutritional state was good, with normal skin and an irregular pulse due to atrial premature contractions. He was not anemic, not icteric. The lungs were vesicular and there was not hepatosplenomegaly and no edema. Scars from drug injections were clearly found along the vessels of the left arm.

Mental State: He was alert, well oriented, co-operative, and his facial expression was not mild and/or vivid. Thought disorders, such as thought blocking and difficulty in concentration, seemed to be occurring. Auditory and visual hallucinations were apparent. He was restless, but did not appear to be frightened. He complained of a vague suffering indicating remarkable anxiety and asked to go home, as soon as possible. Neurologically, no abnormal findings were observed.

Laboratory Findings:

The blood and urine were normal, and the Wassermann's test was negative. The urine test for methamphetamine was not performed. The EEG had 8Hz, 30-50 μ V slow wave activity with the waves predominantly occurring in the occipital region. No paroxysmal abnormality was found.

Personality test: The findings of the MMPI (Minnesota-Multiphasic-Personality-Inventory) indicated that he had a personality disorder.

Discussion

Alcohol intake by a patient with methamphetamine dependence has been considered to be an important reinforcing factor for potentiating the psychiatric symptoms. Thus, attention was focused on the interaction of methamphetamine and alcohol in the present case.

The clinical observation that the patient's psychiatric symptoms, observed in July, 1984 (see Fig. 1), became apparent after both an intervenous injection of methamphetamine (10 mg) and oral ingestion of alcohol (A in Fig. 1) indicates that alcohol may potentiate the psychosis-inducing action of the psychostimulant.

The second clinical finding that subsequent alcohol intake (B in Fig. 1) without methamphetamine reactivated the abnormal experiences (see the arrow in Fig. 1), in September, 1984 suggests that a cross-reverse tolerance to alcohol has occurred in this case.

The other clinical observation that methamphetamine, alone, (injections less than 30 mg) in October, 1984 aggravated the symptoms and resulted in readmission to the mental hospital on October 31, 1984, indicates that the patient has already had some reverse tolerance to this drug.

References

- KIPPERMAN, A. and FINE, E.W. (1974). The combined abuse of alcohol and amphetamines. *Am. J. Psychiatry*, **131**, 1277-1280.
- RUSHTON, R. and STEINBERG, H. (1964). Mutual potentiation of amphetamine and amylorbarbitone measured by activity in rats. *British J. Pharmacol. Exp. Ther.* **144**, 17-23.
- WEISS, B. and LATIES, V.G. (1964). Effects of amphetamine, chlorpromazine, pentobarbital and ethanol on operant response duration. *J. Pharmacol. Exp. Ther.* **144**, 17-23.