

# Second case report of successful electroconvulsive therapy for a patient with schizophrenia and severe hemophilia A

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**Abstract:** Electroconvulsive therapy (ECT) is used for medication-resistant and life-threatening mental disorders, and therefore it occupies an important position in psychiatric treatment. ECT reportedly increases intracranial pressure and is suspected of increasing the risk of intracranial hemorrhage, especially in patients with hemorrhagic diseases such as hemophilia. A decrease in or loss of blood coagulation factors, including factor VIII and factor IX, are found in hemophilia A and B, respectively. Psychiatrists may hesitate to perform ECT on patients with bleeding tendencies, such as in hemophilia. Here, we report the successful use of ECT on a neuroleptic-resistant patient with schizophrenia and severe hemophilia A. We performed ECT 16 times supplemented with coagulation factor VIII to prevent intracranial and systematic hemorrhage. We administered factor VIII concentrates to the patient to keep factor VIII activity at 30%–40% during ECT. The patient did not show bleeding or other complications during the ECT sessions. We suggest that pretreatment with factor VIII can help manage the increased risks of intracranial and systematic bleeding during ECT that is present in patients with hemophilia A. The present report supports the idea of performing ECT safely on patients with hemophilia A by administering factor VIII.

**Keywords:** ECT, hemorrhagic disease, bleeding

## Introduction

Electroconvulsive therapy (ECT) is a strong option for treating patients with medication-resistant depression, a high risk of suicide, psychotic agitation, and other severe mental issues. However, Gaines and Rees<sup>1</sup> suggested that ECT increases cerebral blood flow 1.5-fold to sevenfold and raises intracranial pressure. These effects may increase the risk of intracranial hemorrhage, especially in patients with a brain tumor, an intracranial vascular abnormality, or hemorrhagic disease. Hemophilia, a hemorrhagic disease, is usually an X-linked recessive disorder induced by a deficiency of factor VIII (hemophilia A) or factor IX (hemophilia B). Hemophilia A is the usual form of the disorder, and occurs in about one out of every 5,000–10,000 male births. The number of patients with hemophilia B is about one-fifth that of hemophilia A. Globally, the number of patients with hemophilia is estimated at about 400,000. Although the incidence of hemophilia is low, it is possible that schizophrenia requiring ECT could co-occur with hemophilia. However, only one paper reports a demonstration of the safe usage of ECT in a patient with hemophilia.<sup>2</sup> Herein, we describe a second case of successful ECT for medication-resistant schizophrenia in a patient with severe hemophilia A.

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## Case report

A 26-year-old Japanese man had been treated for severe hemophilia A (severe, coagulation factor VIII activity <1%; moderate, 1%–5%; mild, 5%–40%). He was admitted to a mental hospital for auditory hallucinations, a persecution complex, world destruction fantasies, and psychomotor excitation, and was diagnosed with schizophrenia by *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* criteria.

Olanzapine (20 mg/day) was administered, but improvement was insufficient. Therefore, risperidone (6 mg/day) was coadministered with olanzapine. This resulted in some improvement in the world destruction fantasies. However, the auditory hallucinations, persecution complex, and psychomotor excitation persisted. Then haloperidol (12 mg/day) was combined with olanzapine instead of risperidone. This antipsychotic combination therapy (olanzapine 20 mg/day plus haloperidol 12 mg/day) was partly effective against the auditory hallucinations, but the patient's psychiatric state immediately deteriorated thereafter and suicidal ideation emerged. In addition, his bleeding tendency worsened and multiple subcutaneous hematomas appeared on his body. Because clozapine had not been approved in our province at that time and ECT has immediate and strong effects on schizophrenic symptoms including suicidal ideation,<sup>3</sup> the patient was transferred to our general hospital for the management of hemophilia A and for ECT.

After consulting with hematologists, ECT was performed after the patient had been supplemented with coagulation factor VIII to prevent intracranial and systematic hemorrhage. We administered factor VIII concentrates (1,000 IU; Kogenate® FS, Bayer HealthCare Pharmaceuticals Inc., Leverkusen, Germany) intravenously to the patient a few hours before ECT. The dose of Kogenate® FS was determined to keep factor VIII activity at 30%–40% during ECT. The factor VIII activity target range was recommended by hematologists based on the report by Glaub et al.<sup>2</sup> Since the patient's mental state was impaired, written informed consent for the procedure was obtained from the patient's family.

The patient received succinylcholine, thiopental, and 100% oxygen during ECT. Bitemporal ECT was administered two or three times a week. A Thymatron stimulation device (Somatics, Lake Bluff, IL, USA) was used for ECT; the stimulation conditions were 0.5 ms pulses, 40 Hz, 0.9 A, and 252 mC. After a course of eight ECT sessions, his world destruction fantasies, psychomotor excitation, and

suicidal ideation were improved. However, since his auditory hallucinations and persecution complex persisted, a second course of eight treatment sessions was administered, which ameliorated the remaining psychiatric symptoms. After the 16th ECT session, brain MRI was performed to determine whether organic brain disease was present, and there was no sign of brain disease or bleeding. He was discharged 2 months later.

## Discussion

A task force report of the American Psychiatric Association (APA)<sup>4</sup> has suggested that there are no absolute contraindications to ECT, but that recent stroke, cerebrovascular malformations, and space-occupying intracranial lesions are related to an increased risk of intracranial hemorrhage due to ECT. This APA statement may have discouraged psychiatrists from performing ECT on patients with bleeding tendencies such as in hemophilia. Mehta et al<sup>5</sup> reported the results of a study of 35 patients receiving warfarin, an anticoagulant inhibiting the synthesis of vitamin K-dependent clotting factors such as factors II, VII, IX, and X. The extrinsic clotting system is impaired in patients with hemophilia A, and warfarin extends the intrinsic and extrinsic clotting systems. In the study, international normalized ratio values measured on the day of ECT varied notably, including subtherapeutic, therapeutic, and suprathreshold. Nevertheless, none of the patients developed intracranial hemorrhage. In hemophilia itself, Glaub et al<sup>2</sup> demonstrated that ECT could be performed without bleeding or other complications when patients with hemophilia A were pretreated with factor VIII concentrates. Our report shows the safety of ECT for patients with hemophilia A when they are supplemented with coagulation factor VIII. Patients with hemophilia can even undergo open surgery<sup>6</sup> with appropriate management of the condition with coagulation factors. Thus, although only two patients with hemophilia A have successfully received ECT, evidence suggests that patients with hemophilia can be safely treated with ECT if pretreated with factor VIII.

In conclusion, when a patient with hemophilia A is pretreated with factor VIII, ECT may be performed safely. For patients with hemophilia A, the factor VIII activity target range might be 30%–40% during ECT. More case studies of successful ECT in patients with hemophilia A are needed.

## Disclosure

The authors report no conflicts of interest in this work.

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