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Improvement of Somatic Delusions with Altered Regional Cerebral Blood Flow Following Electroconvulsive Therapy in a Patient with Schizoaffective Disorder

Authors' Contribution:

Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Male, 52-year-old
Final Diagnosis: Schizoaffective disorder
Symptoms: Somatic delusions
Medication: —
Clinical Procedure: —
Specialty: Psychiatry

Objective: Unusual or unexpected effect of treatment

Background: Somatic delusions are false and fixed beliefs about health and organ function, which are observed in various psychiatric disorders. Psychotropic drugs such as antipsychotics and antidepressants are effective for some patients, while the efficacy of electroconvulsive therapy (ECT) for pharmacotherapy-resistant cases has been reported. Previous reports suggest that somatic delusions in delusional disorder somatic type are associated with reduced regional cerebral blood flow (rCBF), but it remains unclear whether this association is also observed in other psychiatric disorders. We report the case of a patient with schizoaffective disorder whose drug-resistant somatic delusions showed remarkable improvement accompanied by altered rCBF after successful ECT.

Case Report: The patient was a Japanese man aged 52 years with a diagnosis of schizoaffective disorder. He was suffering from severe and persistent somatic delusions such as "There is a thick stick or bowl in my head" and "Something like a film stretches over my head and face", which were resistant to several antipsychotics and antidepressants. In our hospital, he received bitemporal ECT 8 times. His somatic delusions started to improve from the third administration, and they disappeared by the eighth administration. In parallel with this clinical improvement, reduction of rCBF in the bilateral parietal and occipital lobes observed before ECT disappeared.

Conclusions: The present study suggests that ECT is a useful choice for drug-resistant somatic delusions. Reduction of rCBF in the bilateral parietal and occipital lobes may be associated with manifestation of somatic delusions in schizoaffective disorder.

Keywords: Delusions • Electroconvulsive Therapy • Psychotic Disorders • Regional Blood Flow

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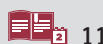
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Background

Somatic delusions are false and fixed beliefs focusing on health and organ function, and are observed most often in schizophrenia, schizoaffective disorder, and delusional disorder somatic type (DDST) [1]. These delusions cause enormous anguish, and sometimes lead to suicide [2]. Psychotropics such as antipsychotics [2-4] and antidepressants [5,6] are efficacious for some patients. For pharmacotherapy-resistant cases in DDST [7], bipolar disorder [8], and schizophrenia [9], electroconvulsive therapy (ECT) has been reported to be effective.

In several reports on DDST, changes in regional cerebral blood flow (rCBF) after successful treatments with psychotropics [4-6] or ECT [7] have been presented. These reports consistently suggest that somatic delusions in DDST are associated with reduced rCBF. However, it remains unclear whether this association between somatic delusions and reduced rCBF is also observed in other psychiatric disorders.

Here, we report the case of a patient with schizoaffective disorder whose drug-resistant somatic delusions showed remarkable improvement accompanied by altered rCBF after successful ECT.

Case Report

The patient was a Japanese man aged 52 years at the time of presentation to our clinic. Written consent for the publication of this report was obtained from the patient. After graduating from a university, he had been working as a public servant. In April 2018, at the age of 51, he developed depressed mood, diminished pleasure, decrease in appetite, insomnia, anxiety, and loss of energy. He visited a psychiatric clinic, and was diagnosed with major depressive disorder. Treatment with mirtazapine 15-45 mg/day was partly effective. In September 2018, he developed somatic delusions, such as "There is a thick stick or bowl in my head which goes up and down or turns around" and "Something like a film stretches over my head and face and moves like gills of a fish". Switching from mirtazapine to paroxetine 40 mg/day was not effective. Addition of aripiprazole 9 mg/day was ineffective and caused bradykinesia.

In June 2019, at the age of 52, he was referred to our clinic. In addition to the somatic delusions mentioned above, affective flattening and avolition were observed. Although he complained of diminished interest and mild concentration difficulty, he did not have depressed mood, decreased appetite, insomnia, guilt feelings, or suicidal ideation. No abnormalities were found on brain magnetic resonance imaging and blood tests. Because of the presence of somatic delusions for 2 or more weeks in the absence of a major depressive episode, he was

diagnosed with schizoaffective disorder according to the DSM-5 criteria [1]. Addition of olanzapine 20 mg/day or brexpiprazole 2 mg/day to paroxetine had no effect and caused body weight gain. Therefore, additional antipsychotics were discontinued.

In November 2019, he was admitted to our hospital to receive ECT because of drug resistance. He complained of marked somatic delusions, but again there were no depressive symptoms. Therefore, paroxetine was gradually reduced to 20 mg/day. Then, he received 8 sessions of bitemporal ECT administered using a Thymatron® system IV machine (Somatics, LLC, Venice, FL, USA). His somatic delusions gradually improved from the third administration of ECT, and disappeared by the eighth administration. In December 2019, he was discharged with residual affective flattening and avolition, but without depressive symptoms. The final diagnosis was schizoaffective disorder [1]. After discharge, paroxetine was gradually switched to risperidone 1 mg/day. As of December 2020, he was still in remission.

Figure 1 shows single-photon emission computed tomography (SPECT) with ^{99m}Tc-ethylcysteinate dimer images obtained in November of 2019 before ECT (A) and in December of 2019 after ECT (B). rCBF was reduced in the bilateral cerebral hemispheres when somatic delusions were prominent. After improvement of these by ECT, reduction of rCBF disappeared in the parietal and occipital lobes, but not in the frontal and temporal lobes.

Discussion

In our patient with schizoaffective disorder, ECT induced marked improvement of somatic delusions, which were refractory to extensive pharmacotherapy with antidepressants and antipsychotics. The present report together with other reports for DDST [7], bipolar disorder [8] and schizophrenia [9] suggest that ECT is a useful choice for treatment of drug-resistant somatic delusions.

In line with previous reports on SPECT images before and after treatment [4-7], reduced rCBF was associated with manifestation of somatic delusions. However, in contrast to DDST [4-7] in which the left temporal and parietal lobes are implicated, in the present case of schizoaffective disorder the bilateral parietal and occipital lobes were implicated. On the other hand, a recent study [9] showed hypometabolism in bilateral frontal-parietal-temporal association cortex in a patient of schizophrenia with Cotard's delusions, which is a cluster of somatic delusions. Therefore, the brain regions responsible for somatic delusions may be different in various psychiatric disorders. Incidentally, our patient's reduced rCBF in the bilateral frontal and temporal lobes remained after ECT and may be associated with residual affective flattening and avolition, as in schizophrenia [8].

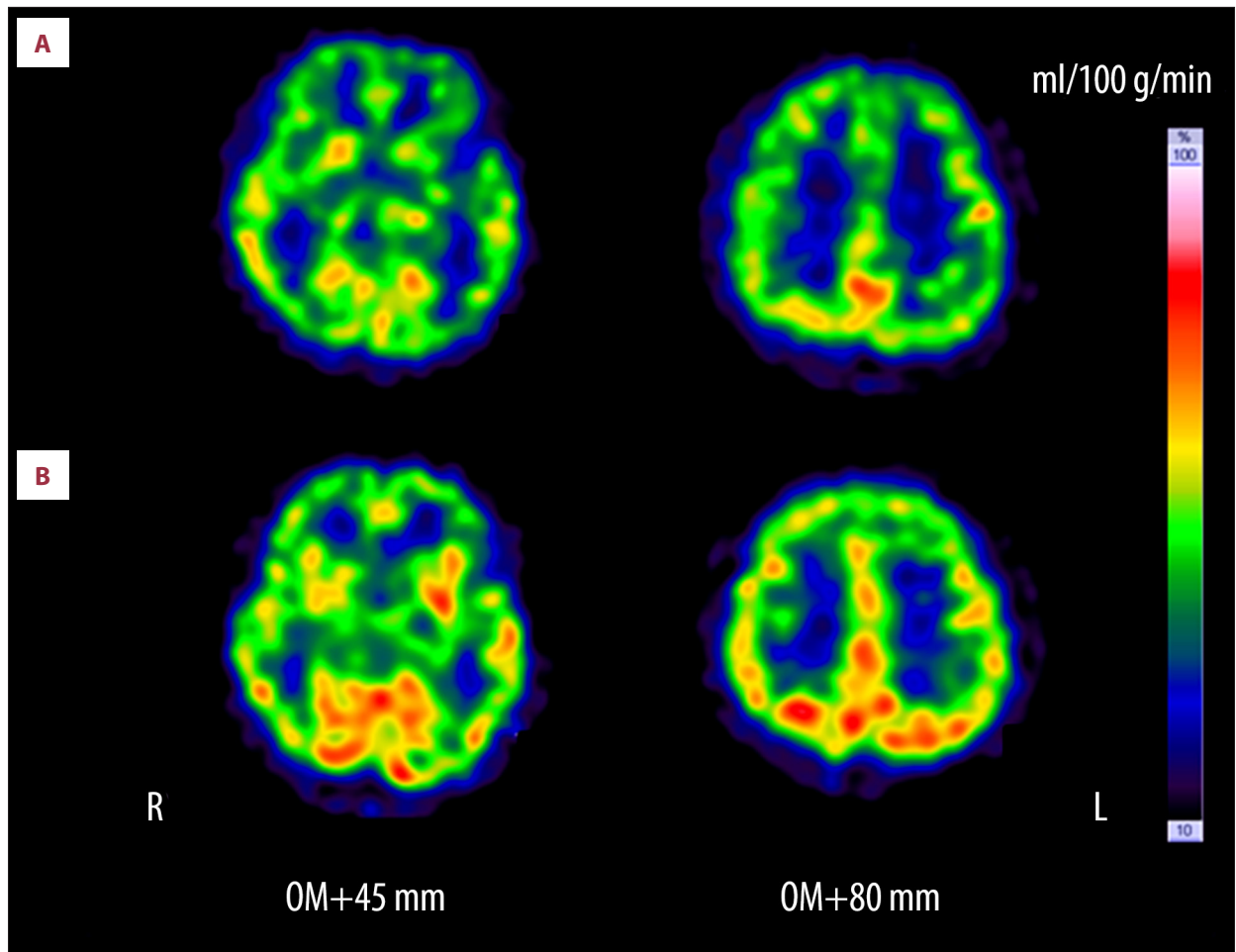


Figure 1. Single-photon emission computed tomography with ^{99m}Tc -ethylcysteinate dimer images obtained in November of 2019 (A) and in December of 2019 (B). OM – orbitomeatal plane.

One may wonder if the altered rCBF in the present case was attributable to paroxetine treatment. However, this possibility is unlikely, since the patient was taking paroxetine both before (40 mg/day) and after (20 mg/day) ECT.

There are 2 limitations in this report. Firstly, the absence of a major depressive episode was not confirmed by use of a depression scale such as the Montgomery Asberg Depression Rating Scale [10]. Secondly, the changes in somatic delusions were not evaluated by a specific scale like the Positive and Negative Syndrome Scale [11].

Conclusions

The present report suggests that ECT is a useful choice for treatment of drug-resistant somatic delusions. Reduction of rCBF in the bilateral parietal and occipital lobes may be associated with manifestation of somatic delusions in schizoaffective disorder.

Conflict of Interest

None.

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