Psychiatry and Behavioral Sciences 2018;8(1):32-4
http://dx.doi.org/10.5455/jmood.20171205125153

CASE REPORT

Bronchospasm Following Electroconvulsive Therapy in an Adolescent Patient with Bipolar Disorder: A Case Report

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ABSTRACT
Electroconvulsive therapy (ECT) is used as a primary treatment in major depressive disorder, including suicide risk, unresponsive manic excitation, and catatonic schizophrenia. Most side-effects of ECT are nondestructive and transient and can be prevented by special precautions. We describe an adolescent patient with bronchospasm developing after ECT. A 17-year-old male with a diagnosis of bipolar disorder was referred to our clinic due to non-response to treatment. He had a history of asthma. We decided to administer ECT due to non-response to treatment. The patient was prepared for ECT following evaluation by an anesthetist. Propofol was administered as an anesthetic and rocuroniumbromide as a muscle relaxant before ECT, and sugammadex was given after ECT. After the second ECT session, saturation decreased to 30%. All possible organic etiologies were excluded. We suspected that the crisis was caused by asthma, and the patient was treated accordingly. Two days subsequently, saturation rose to 95%. Reports of ECT-related bronchospasm are very rare. Propofol is widely used in ECT anesthesia because it has little deleterious effect on hemodynamic stability. Although rare, anaphylactic reactions resulting in bronchospasm have previously been reported.The presence of asthma in our patient may have been a facilitating factor in the progression of bronchospasm. Although in this case it is uncertain whether the bronchospasm was due to ECT or propofol, this should be remembered when applying ECT to patients with asthma.
Keywords: Adolescent, asthma, bipolar disorder, bronchospasm, electroconvulsive therapy, propranolol

INTRODUCTION

Childhood and adolescent-onset bipolar disorder is a severe condition leading to functional losses with several concurrent diagnoses from the early period of life. The lifetime prevalence is reported at 1%, and difficulties are encountered in treatment (1).

Electroconvulsive therapy (ECT), one of the first biological therapeutic methods used in psychiatry, has been applied as an effective tool in the treatment of mental illnesses for many years. In children and adolescents, ECT has been found to be effective in the treatment of such psychiatric disorders such as depression, mania, schizophrenia and schizoaffective disorder (2). Most of the side-effects of ECT are harmless, transient and preventable with special precautions.

Bronchospasm following ECT is a very rare side-effect. To the best of our knowledge, this is the first report of bronchospasm developing after ECT in an adolescent with bipolar disorder.

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Received: December 05, 2017 **Accepted:** February 05, 2018

Citation: Kilicaslan F, Karka I, Ayaydin H, Asoglu M. Bronchospasm following electroconvulsive therapy in an adolescent patient with bipolar disorder: a case report. Psychiatry and Behavioral Sciences 2018;8(1):32-4. https://doi.org/10.5455/jmood.20171205125153

CASE PRESENTATION

A 17-year-old male patient in the third year of high school first presented to the pediatric psychiatry clinic three years previously due to excessive talkativeness, inability

to sleep, irritability, reckless extravagance with money, truancy and staying out at night. This was evaluated as first attack manic episode bipolar disorder, and appropriate treatment was initiated. The patient remained in remission for an extended period, and received treatment at an external center for approximately two months due to excessive talkativeness, reckless extravagance with money, short sleep duration, irritability and damaging his surroundings. When no response to treatment was achieved, he was referred to our clinic. At psychological examination he was fully conscious, and disposed to be cooperative and oriented. Insight was weak, he was easily distracted, length of sleep was low and he was excessively talkative. His mood was euphoric, affectivity was appropriate, flow and rhythm of thought increased, and he had difficulty in achieving his aims.His thought content reflected inflated ego, and psychomotor activity was high. No perceptual disorder was determined. The Turkish-language version of the Young Mania Rating Scale (YMRS) was used to determine severity of symptoms and monitor the course of treatment (3). The patient scored 30 on this scale. When he presented to our clinic he was using valproic acid 2500 mg/day, lithium 1200 mg/day and olanzapine 20 mg/day. He failed to respond to multidrug therapy and was diagnosed with treatment-refractory manic excitation. ECT was scheduled. The patient had a history of asthma. He was first brought to the children's diseases clinic at the age of 10 due to chronic cough, shortness of breath and chest pain. Following evaluations the patient was diagnosed with asthma and was started on budesonide and salmeterol. The patient used these for six years. He described no symptoms in the last one year, and the therapy was gradually reduced and stopped. The patient had received no asthma treatment for the previous one year and described no attacks for the previous one year.

Required consultations were requested. Anesthesia approval was received, and the patient was prepared for ECT. Before the procedure, propofol was administered intravenously as an anesthetic, and rocuronium was given intravenously as a muscle relaxant. Before electrical stimulation, the patient was first given 100% oxygen ventilation, and sugammadex at an appropriate dose was administered intravenously after ECT. Effective contraction occurred in the first ECT session, and no complications arose during postoperative recovery. The second session of ECT took place two days later. Tachycardia developed immediately after this second session, and oxygen saturation measured using a pulse oximetry device fell to 30%. Emergency procedures were performed, and oxygen saturation was raised to 70%. The patient regained consciousness and was transferred to intensive care when his oxygen saturation failed to increase and due to persistence of tachypnea. Following consultation and liaison, this was evaluated as an attack caused by asthma that had been in remission for approximately one year, and an asthma attack therapeutic protocol was applied. The patient was monitored in intensive care for the next two days. Oxygen saturation on the second day was 95%, the tachypnea and dyspnea improved, and the patient was transferred to the psychiatric ward.

DISCUSSION

Electroconvulsive therapy (ECT) has been used in the treatment of psychiatric diseases in children and adolescents for 70 years (2). Although the effect mechanism of ECT is not fully understood, it has been suggested that it stimulates the hypothalamus through direct local electrical activity, convulsion activity or neurotransmitter (dopamine, norepinephrine and serotonin) aggregation (4). However, exactly how the beneficial effects of ECT occur is still unclear. Good results have been reported in 61-100% of ECT applications in children and adolescents with major depressive disorder, catatonic stupor, mania and schizophrenia (2). Kutcher et al. reported that 80% of manic patients responded to ECT, and that drug-resistant acute manic patients also benefited (5). The most common side-effects of ECT in adolescents are headache, nausea and vomiting, agitation and memory disturbances. Grover et al. showed that ECT use is safe in adolescents and that these side-effects are transient in nature (6). Central nervous system tumors

with high cerebrospinal fluid levels, active pneumonia and a recent history of myocardial infarction are regarded as relative contraindications in adolescents (7). The history of asthma in our case did not, therefore, present a contraindication for ECT. Our review of the literature revealed no adolescent cases of bronchospasm developing after ECT. In addition, one retrospective study of adult asthma reported that ECT is safe for this patient group and described low-risk pulmonary complications not requiring routine intubation and only a few minutes in duration (8). Various anesthetic and muscle relaxant agents are used for ECT under general anesthesia. Propofol is widely used in ECT anesthesia since it results in the brief loss of consciousness necessary for ECT and does not impair hemodynamic stability. However, propofol can lead to histamine release. Anaphylactic reactions resulting in bronchospasm have also been reported, albeit rarely (9). The history of asthma in our case may have been a facilitating factor for bronchospasm. Although it is unclear whether bronchospasm in our case was associated with ECT or with propofol administration, this side-effect should still be considered when applying ECT to young asthma patients, and care should be taken to provide the required care before and during ECT (such as premedication with bronchodilators or continuous pulse oximetry monitoring).

In conclusion, this case report is intended to raise clinicians' awareness of the possibility of bronchospasms during application of ECT in young patients with asthma.

Conflict of Interest: Authors declared no conflict of interest.

Financial Disclosure: Authors declared no financial support.

REFERENCES

1. Findling RL, McNamara NK, Youngstrom EA, Stansbrey R, Gracious BL, Reed MD, et al. Double blind 18-month trial of lithium versus divalproex maintenance treatment in pediatric bipolar disorder. J Am Acad Child Adolesc Psychiatry. 2005;44(5):409-17. [CrossRef]
2. Evlice YEE. Duygu durum bozukluklarında elektrokonvülsif terapi. Erişim tarihi: 17 Şubat 2003. (Turkish)
3. Karadağ F, Oral ET, Yalçın FA, Erten E. Young mani derecelendirme ölçeğinin Türkiye'de geçerlik ve güvenilirliği. Türk Psikiyatri Dergisi 2002;13(2):107-14. (Turkish)
4. Eşel E, Baştürk M, Kula M, Reyhancan M, Turan MT, Sofuoğlu S. Effects of electroconvulsive therapy on pituitary hormones in depressed patients. Klinik Psikofarmakoloji Bulteni - Bulletin of Clinical Psychopharmacology 2003;13(3):109-17.
5. Kutcher S, Robertson HA. Electroconvulsive therapy in treatment resistant bipolar youth. J Child Adolesc Psychopharmacol 2009;5(3):167-75. [CrossRef]
6. Grover S, Malhotra S, Varma S, Chakrabarti S, Avasthi A, Mattoo SK. Electroconvulsive therapy in adolescents: a retrospective study from north India. J ECT. 2013;29(2):122-6. [CrossRef]
7. Paillère-Martinot ML, Zivi A, Basquin M. Use of electroconvulsive therapy in adolescence. Encéphale. 1990;16(5):399-404. (French)
8. Mueller PS, Schak KM, Barnes RD, Rasmussen KG. Safety of electroconvulsive therapy in patients with asthma. Neth J Med. 2006;64(11):417-21.
9. Nishiyama T, Hanaoka K. Propofol-induced bronchoconstriction: two case reports. Anesth Analg 2001;93(3):645-6. [CrossRef]