

Successful use of olanzapine in adolescent monozygotic twins with catatonic schizophrenia resistant to electroconvulsive therapy

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Abstract

We describe a case of monozygotic (MZ) male twins (14.6 years old) who suffered from a severe form of catatonic schizophrenia. On admission, the principal symptoms of the brothers were stupor, mutism, catatonic posturing, rigidity, negativism, and refusal of food and liquids. They were treated with electroconvulsive therapy (ECT) with no effect (twin A) and almost no effect (twin B). Both twins improved with initiation of olanzapine therapy. Twin B showed a marked improvement by week 2 on a dose of 10 mg daily (qd). Improvement in twin A was seen by week 4 on a dose of 15 mg qd. Twin B was discharged after 8 weeks and twin A after 11 weeks of olanzapine treatment. This appears to be the first report on concordant positive responses to olanzapine in MZ twins with catatonic schizophrenia, as well as, the first report on concordant resistance to ECT.

INTRODUCTION

Catatonia is a distinct motor syndrome associated with a variety of psychiatric, neurologic, and systemic disorders [Petrides *et al.*, 1997]. According to the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV) [American Psychiatric Association, 1994], clinicians should be able to recognize the syndrome outside the limits of a diagnosis of schizophrenia. It also appears in a separate class as "catatonic disorder due to a general medical condition" and as an indicator of mood disorder "with catatonic features" [Cohen *et al.*, 1999, Fink, 2001]. The authors who wrote the classification guidelines for the International Classification of Diseases -- 10th revision (ICD-10) [World Health Organization, 1992] followed the

Kraepelinian tradition and limited descriptions of catatonia to a subtype of schizophrenia. This was criticized by some clinicians [Kocmur and Vodopivec, 2006].

In the past decades, the diagnosis of catatonia has become increasingly rare in Western clinical practice [Mahendra, 1981]. This may be a consequence of the widespread use of psychotropic drugs [Cohen *et al.*, 1999] or it may reflect a transcultural shift, or both [Martenyi *et al.*, 2001]. Transcultural studies suggest that the catatonic subtype of schizophrenia is more frequent among patients of Asian descent, even when they live in Western countries [Rogers, 1985]. High doses of benzodiazepines and/or electroconvulsive therapy (ECT) are the accepted treatments for catatonia [Fink, 2001, Malur *et al.*, 2001]. However, some authors

Abbreviations & units:

DNA	– deoxyribonucleic acid
DSM-IV	– Diagnostic and Statistic Manual of Mental Disorders, 4 th edition
ECT	– electroconvulsive therapy
ICD-10	– International Classification of Diseases – 10 th revision
MRI	– magnetical resonance imaging
MZ	– monozygotic
NMS	– neuroleptic malignant syndrome
PEG	– percutaneous endoscopic gastrostomy
qd	– quaque die, daily

have reported that typical neuroleptics have demonstrated poor efficacy in catatonia [Hawkins *et al.*, 1995] and should even be avoided if symptoms of catatonia are already present [Blumer, 1997]. Typical neuroleptics may induce catatonic syndrome or exacerbate catatonia to the point of pernicious catatonia also termed neuroleptic malignant syndrome (NMS) [Blumer, 1997]. This recommendation could change with the introduction of atypical neuroleptics (atypical antipsychotics) to psychiatric treatment, with accompanying relevance in some cases.

Olanzapine, an atypical antipsychotic drug, has been reported to significantly reduce catatonic signs and symptoms in a re-analysis of 7 clinical trials involving patients with schizophrenia [Martenyi *et al.*, 2001]. This finding has been supported by case reports of the successful use of olanzapine in adult catatonic patients [Cassidy *et al.*, 2001, Nicolato *et al.*, 2006], as well as in adolescent catatonic patients [DelBelo *et al.*, 2000].

Our case report shows the efficacy of olanzapine in the treatment of catatonic schizophrenia in adolescent monozygotic twins, both having been unresponsive to ECT. Our literature review did not reveal any similar cases.

CASE REPORT

Two brothers, monozygotic twins, 14.6 years old, were diagnosed as having catatonic schizophrenia, one at 13.7 years of age and the other at 14.1 years. They had originally been considered to be dizygotic twins until DNA analysis, performed during hospitalization in our department, showed otherwise.

The twins were born by spontaneous delivery in the ninth month of pregnancy. Psychomotor development had been uncomplicated. Both brothers suffered from allergies; this condition was more pronounced in twin A (dust, pollen, grass, cats). With the exception of allergies, they're early childhood health was unremarkable. There was, however, a history of psychiatric problems in the immediate family. The mother had been treated for somatoform autonomic dysfunction and the father had undergone psychiatric treatment for symptoms resembling manic and psychotic symptoms. Unfortunately the information on the diagnosis and other details of the father's illness were not available. The parents had

divorced when the boys were 7.5 years old and afterwards the father had only intermittent contact with the family.

Information regarding the individual twins is presented below in chronological order. For that reason the case history of twin B is present first followed by the case history of twin A.

Twin B

The first signs of a psychiatric illness occurred in twin B when he was 12.2 years old. School performance and personal hygiene deteriorated markedly, and he stopped communicating in the school. Eating problems appeared, with an associated weight loss of 8 kilograms. His first contact with psychiatric out-patient care was at age 12.6; at this time he was diagnosed with depressive conduct disorder. He was treated consecutively with low doses of sertraline, risperidone, olanzapine, clonazepam, tiapride and haloperidol; most of the treatments were short-term and without any marked effect. During this time he had two hospitalizations in the child psychiatric unit and on both occasions the differential diagnosis considered psychotic illness, however, this diagnosis was ultimately rejected.

The patient was admitted to our department when he was 13.7 years old and was, for the first time, diagnosed as having catatonic schizophrenia. The presenting constellation of symptoms included stupor, mutism, catatonic posturing, rigidity, negativism, and refusal of food and liquids. Laboratory and medical examinations, as well as magnetic resonance imaging (MRI) of the brain were negative. The initial treatment with ziprasidone, in doses up to 120 mg daily (qd), was unsuccessful. Twin B also received a series of (total of eight) electroconvulsive therapy treatments (at Charles University's Department of Adult Psychiatry). The clinical state of the patient remained almost unchanged following ECT; however, some improvement in food and liquid intake was observed. Twin B was temporarily discharged home on ziprasidone and sertraline.

The patient was re-admitted, when he was 14.3 years old, after refusing home medication. On admission he was stuporous, mutistic and incontinent. The antipsychotic therapy was changed; ziprasidone was switched to olanzapine (5 mg qd) while co-treatment with sertraline (100 mg qd) was continued. An overall improvement was seen by the second week of olanzapine administration (10 mg qd). The patient started to communicate (mostly with one-word answers) and the problem of incontinence had resolved. He was also more compliant and was able to take part in therapeutic activities. His food intake improved and a weight gain of 5 kg was observed over the next two months. However, some symptoms, like apathy and passivity, remained. After 8 weeks of olanzapine treatment the patient was discharged home on olanzapine 15 mg qd and sertraline 100 mg qd.

Twin A

The first signs of psychiatric illness occurred at age 12.4 years; 3 months later than twin B. Initial symptoms were similar to those of his twin brother. His first contact with psychiatric out-patient care was at age 12.6 (together with the brother); he was also diagnosed with depressive conduct disorder. However, while his brother was put on medication at this time, twin A was not. Twin A also had two hospitalizations at the child psychiatric unit (at the same times as his brother). Twin A received consecutive treatment with low doses of risperidone, sertraline, sulpiride, oxazepam and melperone. As was the case with his brother, most of the treatments were short-term and none had any marked effect.

The patient was admitted to our department when he was 14.1 years old (0.4 years after his brother) and like his brother, was for the first time, diagnosed as having catatonic schizophrenia. The symptoms in twin A paralleled those seen in his brother: stupor, mutism, catatonic posturing, rigidity, negativism, and refusal of food and liquids. Laboratory and medical examinations, as well as magnetic resonance imaging (MRI) of the brain were negative. Initial treatment with the liquid form of ziprasidone, in doses up to 110 mg qd, was unsuccessful, which had been the case for his brother as well. A series of (total of seven) electroconvulsive therapy treatments (at the regional psychiatric hospital) were administered. ECT was completely unsuccessful, with no effect on food and liquid intake. The patient's failure to eat ultimately led to a percutaneous endoscopic gastrostomy (PEG) being performed to ensure proper nutrition. He was put on quetiapine, on doses up to 500 mg qd, but without any effect. Because of the responsiveness seen in twin B to olanzapine, treatment with olanzapine (10 mg qd) was also initiated in twin A. Olanzapine was increased to 15 mg qd and improvement was seen by week 4, although improvement was less marked compared to twin B. Although stupor and negativism resolved, mutism and problems with food refusal remained. An attempt to augment olanzapine with sertraline (similar to twin B) was not associated with significant changes. After 11 weeks of olanzapine treatment the patient was discharged home on olanzapine 20 mg qd and sertraline 100 mg qd, additionally, the gastric feeding tube remained in place and continued to be necessary to assure proper nutrition.

DISCUSSION

The majority of published reports on the topic stress the usefulness of ECT treatments in catatonic patients who had previously been refractory to psychotropic drugs. This has been reported for both adult patients [Suzuki *et al.*, 2003] and adolescents [Cizadlo and Wheaton, 1995; Yeung *et al.*, 1996]. It is now generally accepted that ECT is as effective in youths as it is in adults and the administration of ECT follows the same general principles in all age groups [Zaw, 2006]. The efficacy

of ECT in catatonia has been reported to be as high as 85% - 100% [Hawkins *et al.*, 1995; Rohland *et al.*, 1993; Suzuki *et al.*, 2003].

Our case report shows something a little different – it demonstrates the usefulness of, the atypical anti-psychotic drug, olanzapine, in a case where ECT had previously failed. Since the case involved twins, the report gains significance because of the diminished possibility that ECT was done in a technically inappropriate way. Both twins received olanzapine in combination with sertraline: in twin B, olanzapine was added to sertraline, while in twin A, olanzapine therapy was later augmented with sertraline. However it was clearly demonstrated in both cases that sertraline did not have a substantial effect on the patients' catatonic syndrome.

The use of twin reports in psychiatry is not as frequent as it is in other fields of medicine [Wielgos *et al.*, 2006]. However, twin reports may provide broader and perhaps more powerful evidence than sole case reports. We found a similar report of a concordant response to olanzapine therapy in adult monozygotic twins with schizophrenia, but without the use of ECT [Mata *et al.*, 2001]. We also found a case report of adolescent identical twins with autistic spectrum disorders who had exhibited catatonia and both had been successfully treated with ECT [Bailline and Petraviciute, 2007]. The concordance of the positive response to ECT in this case corresponds to the concordance of the negative response to ECT in our case. Our findings support the view that genetic factors may be important in predicting responses to olanzapine as well as other biological treatments in psychiatry [Mata *et al.*, 2001].

CONCLUSIONS

Our case report supports the use of olanzapine for the treatment of catatonic schizophrenia. Our experience is in agreement with findings already published in the literature.

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