



## Case Report

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# Electroconvulsive Therapy in Adolescent with Complex Psychotic Episode: A Case Report

**Anne Sophie Chery<sup>1</sup>, Jacques Bagur<sup>2\*</sup>, Sophie Lonjarret<sup>3</sup> and Dorothee Charvet<sup>1</sup>**<sup>1</sup>Hospital Saint Jean de Dieu, Ulysses Unit for Children and Adolescents, France<sup>2</sup>Hospital Saint Jean de Dieu, Research Federation, Research Federation<sup>3</sup>Department of Multipurpose Medicine, Hospital Saint Jean de Dieu, France**\*Corresponding author:** Jacques Bagur, Centre Hospitalier Saint Jean de Dieu, 290 route de Vienne, 69008, Lyon, France.**Received Date:** May 22, 2019**Published Date:** June 11, 2019**Keywords:** Acute psychotic episode; Adolescence; Adverse effects to neuroleptics; Resistance; Electroconvulsive therapy

## Introduction

Despite caregivers' negative views, electroconvulsive therapy (ECT) in adolescents could be effective in mood disorders, especially those with pharmacoresistance. Unilateral ECT may lead to better results than bilateral ECT in this indication. This clinical case shows the interest of using ECT in adolescents suffering from severe pathologies along with neuroleptic intolerance.

## Case Report

We report the case of a 16-year-old female with an atypical drug-resistant delusional melancholia, who benefited from electroconvulsive therapy (ECT) following two different protocols. Ramya, a girl from India and from immigrant parents in difficult conditions, who was followed for four months at the Medico-Psychological Centre (CMP) for mood and conduct disorders, made a first brutal acute psychotic decompensation with delusion of filiation, mistrust and aggression associated with manic symptoms, which required her hospitalization in the emergency unit, and the introduction of a treatment with risperidone. After 5 days of treatment, due to the appearance of a typical neuroleptic malignant syndrome associated with fever, increased creatine phosphokinase (CPK) and extra-pyramidal syndrome, risperidone had to be interrupted. She was then transferred to a child psychiatry care unit for adolescents.

Two weeks later, after both the clinical and biological remissions of the malignant syndrome had been observed, treatment with aripiprazole was introduced. But ten days later, it needed to be

stopped, due to the appearance of a new onset of neuroleptic malignant syndrome. The psychiatric picture of Ramya remained unchanged during that period. One month later, she showed signs of confusion, mental clouding with a regressive picture, associated with abnormal transitional peri buccal motions which, in view of the atypical clinical history and evolution of the patient, made us fear an auto-immune encephalitis, thus requiring her hospitalization in neurology unit for thorough investigation.

Apart from an inflammatory cerebrospinal fluid found at the first lumbar puncture, complementary tests proved normal - in particular the MRI of the brain and a new lumbar puncture and demonstrated that the diagnosis of auto-immune encephalitis was wrong. At the same time, a medical genetic consultation to study pharmacokinetics of psychotropic drugs was carried out to adapt the neuroleptic treatment, recommending treatment with olanzapine or clozapine. A multidisciplinary consultation meeting amended the reintroduction of a new neuroleptic treatment with olanzapine, in the form of a corrective treatment with tropatepine for 3 months, along with ECT sessions if olanzapine proved to be a failure. One month after she was admitted in neurology, a new episode of agitation with withdrawal symptoms, total opposition to the treatment and accusation of delusions, necessitated the rehospitalization of Ramya in child psychiatry unit.

Thus, olanzapine treatment was reintroduced but proved ineffective after a two-months well-led treatment at an effective dose: a psychotic picture with mood symptoms persisted, of

rather melancholic nature, as well as delusion of filiation leading to mutism. Coming back to the fore, these new mood symptoms, which included sadness, loss of self-esteem, ideas of incurability and morbidity, led us to discuss the diagnosis and reminded us of a case of delusional melancholia. Before that opinion, we had initially suspected acute delirium or schizo-affective disorder. Another multidisciplinary consultation meeting was held, calling for twice-weekly treatment with ECT therapy, associated with both olanzapine and a decrease in the dose of tropatepine. A first ECT session was carried out bilaterally, after titration of 3 pulses, at 240mC (millicoulombs). Ramya then presented a febrile episode with another CPK increase, i.e. two months after the introduction of olanzapine, which altogether led to interrupt treatment. At the 6th session, we observed inversion of mood turning into manic episode symptoms along with disinhibition, which confirmed the thymic tone in the clinical picture of Ramya. We eventually diagnosed delusional melancholia.

In order to potentiate ECT therapy, and following the previous genetic consultation meeting, we discussed introducing clozapine, which was done gradually, from 12.5 to 100 mg. Another CPK increase without fever or neurological symptoms led to a decrease in medication (50mg). The persistence of mood disorders and psychotic elements required the continuation of ECT therapy for two more months. A total of 19 bilateral ECT therapy sessions were performed, with a pulse at 240mC, an electroencephalogram (EEG) seizure duration of 19 seconds, showing a good tolerance over two months. Clinically, we were able to observe significant improvement in the relationship between Ramya, her parents and caregivers, but delusion of filiation and significant behavioral disorders persisted, with disinhibition, agitation, and hetero-aggressive behavior.

One last multidisciplinary consultation meeting was held, and it finally recommended the implementation of weekly sessions of ECT sessions, with a protocol change totaling 4 unilateral sessions in right hemi- temporal, an impulse at 230.4mC, and average seizure duration of 24 and 26 seconds. This new protocol allowed significant recovery from psychiatric disorders with cognitive improvement, decreased sedation and fewer memory disorders, allowing recovering of appropriate behavior and speech.

## Discussion

In this case, we faced diagnostic difficulties because of the atypical clinical picture, which altogether evoked either mood disorder, paranoid schizophrenia or schizoaffective disorder. Choice of treatment also proved difficult due to the severity of symptoms as well as the intolerance and resistance to neuroleptic treatments. Please note that the genetic study also suggested a risk of high serotonin syndrome, which is why we were reluctance to introduce an antidepressant drug.

Addition of clozapine has potentiated treatment because of its better tolerance, particularly on a neurological level, allowing an increasingly frequent use of this drug in adolescents. However, clozapine remains a second-line treatment because of risks of

agranulocytosis and of intensified biological monitoring [1], which is why olanzapine was preferred as first intention treatment, as the pharmacological genetic analysis also recommended it, despite signs of the appearance of neuroleptic malignant syndrome, but later in time in comparison with the previous neuroleptics. This shows the importance of a genetic consultation, with a better tolerance profile recommended for these two treatments. But it also shows its limits regarding olanzapine and the long-term appearance of a malignant syndrome.

ECT indeed has few adverse effects, but medical teams are reluctant to this type of treatment in adolescents because only few experimental studies have been carried out [2] and because staff faces difficulties with ECT as it might interfere with cerebral maturation and growth, or inhibit normal functioning of the brain [3]. On the other hand, pathology causing abnormal behavioral disorders may have important effects on learning and maturation. Altogether, ECT remains relatively well accepted by adolescents and by their parents [4].

ECT is both indicated in adolescents and adults and remains possible in delusional melancholia in 2nd or 3rd intention, when poor pharmacological tolerance is observed [5]. ECT is an old and constantly evolving technique that should be properly used only when necessary, as in the case of Ramya, who met the criteria for ECT in adolescents, i.e. nosographical diagnosis, severity of the symptomatology and resistance to treatment [6].

The transition to weekly and unilateral sessions has led to spectacular clinical and cognitive improvements as well as better cognitive tolerance, hence leading to their recommendation. But, according to some studies, that remains controversial [7]. Indeed, several studies demonstrate that there is no difference in efficacy between high-dose, bilateral and unilateral ECT, but report that right unilateral ECT with brief stimulation and modern equipment retains its efficacy and reduces adverse cognitive effects [8]. In our case, Ramya showed increased anterograde memory disorders with bilateral ECT which, subjectively according to both staff and patient's clinical observations, were clearly attenuated with unilateral ECT. However, because of the clinical condition of the patient, no preliminarily objective cognitive assessment was made before starting ECT therapy.

## Conclusion

Despite caregivers' negative views, ECT in adolescents seems well tolerated and has proved to be effective in mood disorders. It would be interesting to add to the inclusion protocol in ECT a cognitive assessment before and after the ECT sessions, using standardized qualitative scale which would allow the evaluation of cognitive functions, provided that the clinical state of the patient allows it.

This clinical case shows the interest of using ECT in adolescents suffering from severe pathologies along with neuroleptic intolerance. It further shows better efficacy and tolerance with unilateral ECT in comparison to bilateral ECT. It would also be

interesting to provide child psychiatrists and caregivers working with adolescents more information and more training on this specific therapeutic tool.

### Acknowledgement

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### Conflict of Interest

No conflict of interest.

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