

# Lifesaving electroconvulsive therapy; A physician's prospective

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Ishaq S, Delfosse E, Tariq S, et al. Lifesaving electroconvulsive therapy; A physician's prospective. *J Clin Psychiatry Neurosci* April-2018;1(2):15-7.

Depression and dementia have a very intimate relationship and hence differentiating the two can be technically challenging. Severe depression can masquerade as dementia and it is therefore extremely important to differentiate between these two as it can impact the management.

A patient was admitted with acute confusion, poor mobility and poor oral intake and was initially treated for Urinary Tract Infection (UTI). However, as confusion remained fluctuant, patient was started on treatment for presumed encephalitis. Due to poor response treatment was

withdrawn. Patient was then referred to gastroenterology department for consideration of enteral feeding due to malnourishment secondary to confusion and possibly dementia. However, on further assessment a psychiatric opinion was sought and as expected a diagnosis of severe depression was made and hence Electroconvulsive Therapy (ECT) was proposed. Patient made a remarkable recovery with ECT and was subsequently discharged to a rehab facility. With prompt recognition of symptoms patient avoided enteral feeding which made a great difference in overall recovery.

**Key Words:** Electroconvulsive therapy; Depression; Dementia; Encephalitis

## INTRODUCTION

A 75 yr old patient, presented to A&E on the 30/6/17 with confusion, reduced mobility and poor oral intake. Patient encountered several recent falls at home rendering patient unable to mobilize. This was thought to be due to a UTI which was treated in the community. However, patient's symptoms had failed to improve.

Patient family described a general and progressive decline over several weeks in which the patient had a lack of appetite, was withdrawing from daily activity with mood being low and speech monosyllabic. On admission patient was haemodynamically stable and afebrile. Systemic examination was grossly unremarkable but Abbreviated Mental Test (AMT) score was 7 out of 10, that predicted a probable cognitive impairment. Initial bloods were essentially within normal range besides a mildly raised calcium of 2.76 (2.05 – 2.60 mmol/l) and inflammatory markers CRP 14 (<3 mg/l) WCC 12.9 (4.0-11.0\* 10<sup>9</sup>/l). Patient treated as UTI, and patient's falls attributed to cognitive decline. Further investigations including thyroid and parathyroid function test were normal and did not explain the mildly raised calcium. Hereafter patient was deemed medically fit for discharge pending social assessment.

In the days following, patient was witnessed to have multiple vacant episodes. Repeat bloods tests were grossly normal and CT scan of head showed mild global atrophy consistent with age and small vessel ischemia. The patient had a known diagnosis of depression and was already on citalopram which was increased by the psychiatric liaison nurse following their assessment. Unfortunately, her mood and behavior continued to fluctuate despite this.

The medical team organized a Lumbar Puncture (LP) and MRI head to rule out encephalitis for which she was empirically treated. LP results, including PCR were negative for bacterial or viral infection. MRI was abandoned as it was not tolerated by patient. An EEG was also normal. A neurology opinion was pursued, and an array of tests was requested including: anti-brain antibodies/autoantibodies/immunoglobulins/motor neural antibodies/neuroimmunology/hepatitis and syphilis screen which all returned normal. It was then decided that the patient be transferred to Gastroenterology for consideration of enteral feeding, as her albumin had dropped to 26 g/l from 36 g/l and she had developed acute kidney injury with a creatinine of 104, this was secondary to her poor oral intake.

The patient was intended for nasogastric feeding initially. Although, given her fluctuant confusion we thought her symptoms were purely related to severe depression rather than cognitive decline/dementia and a psychiatrist review was requested promptly. This differentiation was important as enteral feeding in confused/dementia patient can be challenging and is usually not indicated particularly in advanced dementia.

The patient continued to decline in terms of her engagement with nursing staff, refused to eat and drink and gradually became mute and stuporous. A provisional diagnosis of severe depression with catonic features was formulated by the psychiatric team. The patient was detained under the *Mental Health Act* with a view to administer ECT as treatment. Detention under mental health act is usually undertaken for people who have a serious mental health condition which needs treatment in the hospital against their wishes. It is usually undertaken by approved mental health professional and two doctors according to the set protocols. The patient received 6 sessions of ECT after which gradually began to exhibit significant improvement in mood and communication. Patient began engaging in conversation, taking interest in TV and self-feeding. After a total of 10 ECT sessions the patient made a remarkable recovery and was transferred to a rehab facility with a view to discharge home with support.

ECT is a recognized treatment modality for severe depression, however recognizing signs of depression is often missed in a patient in busy tertiary care center. These symptoms often get labeled as encephalitis/dementia and patient get referred to institutional care for further management. It is also very rare for a patient to receive ECT in a tertiary care center and hence it is extremely important to be aware of these symptoms as correct diagnosis can change patient outcome.

## DISCUSSION

### Epidemiology

According to the World Health Organization, over 300 million people worldwide suffer from depression [1]. It is the leading cause of disability worldwide and affects 19.7% of people aged over 16 in UK in 2014, with an increase of 1.5% on the previous year [2]. Furthermore 20-28% of men and women aged over 65 years suffer from depression and approximately 85% of these people do not receive treatment from the NHS [3]. In addition, it is known that 15-20% of those with dementia are also suffering

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Received: March 24, 2018, Accepted: April 09, 2018, Published: April 16, 2018



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from depression. However, the clinical manifestation in this population significantly differs to that of older adults with normal cognition. More specifically, there are higher rates of delusions, hallucinations, agitation and fatigue with advanced dementia particularly Alzheimer's type (Table 1) [4,5].

**Table 1: Depression, Dementia, Encephalitis.**

	Psychomotor agitation
	Psychomotor retardation
	Flattening
	Other common symptoms are:
	Reduced concentration and attention
	Reduced self-esteem and self-confidence
	Ideas of guilt and unworthiness (even in a mild type of episode)
	Bleak and pessimistic views of the future
	Ideas or acts of self-harm or suicide
	Disturbed sleep
<b>Depression</b>	Diminished appetite, weight loss, nutritional depletion
	Difficulty in concentrating
	Impaired communication
	Disorientation
	Poor Judgment
	Difficulty in mobilising, swallowing
<b>Dementia</b>	Weight loss, self-neglect
	Behavioural changes, fluctuating consciousness
	Neck stiffness
	Photophobia
	Acute confusion
<b>Encephalitis</b>	Flaccid paralysis, focal seizures

The diagnostic criteria of depression according to ICD 10 include the following 10 symptoms:

- 1) Persistent sadness/low mood
- 2) Anhedonia
- 3) Fatigue
- 4) Sleep disturbance
- 5) Poor concentration
- 6) Low self-esteem
- 7) Poor or increased appetite
- 8) Suicidal thoughts or action
- 9) Agitation or slow movements
- 10) Guilt or self-blame [6].

These symptoms must be present daily for over 1 month to be considered depression. Severe depression is considered when there are over 7 of the above present with or without psychotic symptoms such that daily life is 'extremely difficult [6,7].

## Electroconvulsive Therapy (ECT)

NICE guidelines recommend the use of ECT 'only to achieve rapid and short-term improvement of severe symptoms. This is after an adequate trial of other treatment options has proven ineffective and/or when the condition is considered to be potentially life-threatening, in individuals with catatonia or in a prolonged or severe manic episode [8].

ECT is the practice by which an electrical current is applied transcutaneous to the brain via two electrodes to induce a generalized seizure under general anesthesia and muscle relaxant, typically delivered twice, weekly over a course of 3-6 weeks [9]. ECT was first developed in 1938 and till date it is the most effective and evidence based treatment for very severe depression. However due to its controversial nature, negative publicity and public perception it is relatively underutilized in comparison to other forms of treatment for mental disorders. One could say this is due to its mode of action not being clearly understood. A few models have been proposed over the years on the mechanism of ECT. The common theme of these models is that psychiatric disorders are a result of disrupted neural circuits in the hippocampus, amygdala and other areas of the prefrontal cortex which effect feelings, thoughts and behavior. Arnone has reported that there is a correlation with depression and the reduction in the volume of the hippocampus. Following successful treatment with anti-depressants, it has been seen that there is an increase in the grey matter of the hippocampus. The hippocampus is a key structure involved in mood and memory. Although ECT has not been found to cause any structural brain damage, it has been shown that treatment has led to an increase in bitemporal hippocampal volume as well as an increase in cell proliferation in this area [10]. ECT treatment has also shown a variety of changes in neurotransmitters such as Gamma-Aminobutyric Acid (GABA) and Serotonin which are likely to contribute to the therapeutic effects of ECT [11]. It has also shown to reduce hospital readmission in patients receiving ECT vs Placebo.

The Royal College of Psychiatrists report remission rates of 60-80% when ECT is used as first line treatment in those with severe depressive episodes and even higher rates in psychotic depression. Similarly, high rates are seen in the elderly who are also shown to have a more rapid response.

Our patient exhibited just 2 features of encephalitis; altered mental state and possible partial seizures in the form of vacant episodes. However, patient clearly displayed multiple features of severe depression and eventually catatonic features. Low mood, lack of enjoyment and reduced energy ultimately affected patient ability to function as normal on a daily basis. Despite limited evidence for encephalitis she was empirically treated as such and a diagnosis of mental health disorder took a back seat. Other diagnoses that could have been considered include Parkinson's disease, advanced dementia, malignant hyperthermia, serotonin syndrome, stiff-person syndrome, locked-in catatonia and non-convulsive status epilepticus [12].

This patient changed the way we practice. In retrospect a diagnosis of severe depression in this case may seem obvious, yet it is surprising how it did not make an appearance in the medical team's initial differential diagnoses, despite a history of declining and altered mental state.

## CONCLUSION

This case illustrates the importance of early recognition of signs and symptoms of depression which can be difficult in an acute busy hospital due to workload and psychiatric involvement in adult patients with reduced responsiveness and the benefits of treatment, specifically ECT. This is particularly significant where no underlying organic cause is found and in those with a past medical history of mental health disorders; in this case previous depression. The other benefit of involving psychiatry early is that it helps in more accurate and timely diagnosis of depression vs dementia. This can affect the proposed management plan, as we found with our patient, who was falsely labeled as dementia and referred for consideration of enteral feeding. It was the recognition of depression and initiation of ECT that saved the patient from being taken down this route

of dementia and consideration of an invasive procedure such as NG/PEG feeding.

This is very common in the acute medical setting where we, the physicians, are too focused on looking for a medical diagnosis that we can become oblivious to the underlying psychiatry disorder. This should be at the forefront of our minds especially with such high rates of mental health disorders, specifically depression, and a continual aging population who have a susceptibility to suffer such disorders. A number of patients often get mislabeled as dementia/cognitive decline and get transferred to care facilities due to lack of awareness of signs of depression particularly in acute hospitals where physicians are focused on finding an organic cause for patients symptoms. Would these people have benefited from a psychiatric opinion and maybe even ECT? We must ask ourselves; are we failing a proportion of our patient population in underdiagnosing them with depression and therefore not providing treatment? If the answer is 'Yes', then is this due to a lack of knowledge regarding the symptoms of severe depression and/or the lack of understanding, or controversy, of the recommended treatment, ECT, itself?

Thus there is need to equip and educate physician of 21st century to include mental health disorders part of curriculum.

#### CONFLICT OF INTEREST

None.

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