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COMPARISON OF CLINICAL OUTCOME AND RECOVERY PROFILE OF ETOMIDATE AND PROPOFOL IN ELECTROCONVULSIVE THERAPY

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ABSTRACT **Objectives:** to compare the clinical outcome and recovery profile of the hypnotic drugs propofol and etomidate after electroculvulsive therapy. Method: Eighty patients were randomized to receive one of the 2 drugs (n = 40 in each group), during a course of electroconvulsive therapy treatment. The primary outcomes were the course of ECT: treatment motor seizure duration as recorded by visual muscular contractions and amount of time until transfer to the recovery room.
Results: Patients who received propofol had a significantly shorter mean motor (etomidate = 46.1 ± 14.4, propofol = 22.9 ± 7.1) seizure duration than etomidate. Both of the drugs used in this study showed a very short time for recovery, but better one was propofol.
Conclusions: Patients who received propofol had longer acute courses of ECT and consequently, longer and costlier inpatient stays. Etomidate could be a better alternative induction agent in ECT.

KEYWORDS : electroculsive therapy, seizure, etomidate ,propofol.

Introduction

Electroconvulsive therapy (ECT) is most commonly used to treat severe or medication resistant depression, although it can also be beneficial in mania and catatonia. During ECT, an electrical current is applied transcutaneously to the brain via two electrodes positioned either bilaterally or unilaterally. The overall aim of both techniques is to induce a generalized seizure with characteristic EEG changes. Too short (.10 s) or too long (.120 s) may reduce clinical efficacy but other research suggests that the amount of current delivered is more important than length of seizure. Typically, ECT is performed twice weekly until there is a lack of further improvement (on average, 3–4 weeks). Maintenance ECT thereafter is not generally recommended.

Etomidate can precipitate generalised seizure activity in patients with epilepsy, and it does not inhibit evoked seizures in patients undergoing ECT. Induction is associated with high incidence of excitatory phenomenon, including spontaneous muscle movement, hypertonus, and myoclonus. Propofol can shorten the duration of convulsions after ECT, which can be a therapeutic disadvantage.

Materials And Methods

The present study was Prospective Cohort Study conducted in the Department of Anaesthesia, Civil Hospital, Ahmedabad in collaboration with Departments of Psychiatry, Civil Hospital , Ahmedabad. Our objective in this study was to compare the effects of the anaesthetics used today for ECT (propofol and etomidate) on the course of treatment and recovery time after treatment on 80 subjects which comprised all the patients of age 15 to 65 years treated with elective ECT in the department of Psychiatry between the years 2012 and 2014. The patients were divided into 2 groups according to the anesthetic used during ECT: propofol or etomidate. Dose of the drugs given were: propofol 1 × body weight (60mg–100mg), and etomidate 0.15 × body weight (8mg–12mg) of the patient. Z test was performed for the data evaluation.The primary outcomes were the course of ECT: treatment motor seizure duration as recorded by visual muscular contractions and amount of time until transfer to the recovery room. The effectiveness of the seizure was defined as minimum 25 seconds of clinical seizure.

Results

Demographic details are mentioned in the table below.

Table 1:demographic details

Socioeconomic status	Upper	4 (5%)	Age(years)	≤20	2(2%)
	Upper middle	9 (11%)		21-39	56 (70%)
	Lower middle	23 (29%)		40-59	14 (18%)
	Upper lower	29 (36%)		>60	8 (10%)
	Lower	15 (19%)	BMI (kg/m2)	<18.5	22 (27%)
Educational level	Illiterate	24(30%)		18.5-24.9	44 (55%)
	Primary	36 (45%)		25-29.9	12 (15%)
	Metric	14 (17%)		>30	2 (3%)
	Graduate	6 (8%)	Diagnoses	Major depression	38 (47%)
Religion	Hindu	62 (77%)		Bipolar depression	22 (28%)
	Muslim	14 (18%)		Schizoaffective disorder	12 (15%)
	Other	4 (5%)			

Patients who received propofol had a significantly shorter mean motor (etomidate = 46.1 ± 14.4, propofol = 22.9 ± 7.1) seizure duration than etomidate.

When the effects of anaesthesia with etomidate or propofol on the recovery times after ECT are evaluated, propofol has been reported to have a better recovery profile.

Table 2 : Comparison of propofol and etomidate on the basis of course of treatment and recovery time

Variable	Propofol (n =40)	SD	Etomidate (n=40)	SD	P-value
Duration of seizure					
Mean motor seizure duration (sec)	22.9	7.1	46.1	14.4	<0.001
Recovery periods					
Beginning of spontaneous breathing (min)	3.31	0.76	3.13	1.14	0.4
Eye opening (min)	4.34	1.3	5.54	2.4	0.005
Mean Time for recovery (min)	7.4	1.9	10.7	3.6	<0.001

Discussion

Propofol, which is a hypnotic agent that exerts its effect on GABA receptors has a rapid onset of its effect and short recovery time. Propofol is also the hypnotic agent with the strongest anticonvulsant effect among the intravenous anesthetics used during ECT and thus raises the seizure threshold and reduces the duration of the seizure induced.

Etomidate has a rapid onset of effect and rapid metabolism. It has also been reported to have a minimal effect on the seizure threshold

induced by ECT . In comparison to propofol, etomidate enables the longest convulsions , and it may be preferred in patients with short durations of convulsions in response to the highest electrical stimulation .

Independently from the energy dose applied, the anesthetic agent used during the ECT plays an important role in achieving an adequate duration of seizures.

During the ECT of patients , propofol was shown to possess significant seizure-shortening properties. Mean seizure durations were significantly longer ($p < 0.001$) for the etomidate sessions as compared with the propofol session. Thus among drugs used for the anesthesia of electroconvulsive therapy (ECT), propofol reduces seizure duration to a greater degree than etomidate.

When the effects of anesthesia with etomidate or propofol on the recovery times after ECT are evaluated, propofol has been reported to have a better recovery profile. In our study, the times until the beginning of spontaneous breathing, eye opening and following orders have been found to be significantly shorter in the propofol group compared to the etomidate .

Patients who received propofol had longer acute courses of ECT and consequently, longer and costlier inpatient stays. Etomidate could be a better alternative induction agent in ETC.

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