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Original Research Article

A Comparative Study of Thiopentone and Propofol as Induction Agent for Modified Electroconvulsive Therapy

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Abstract:

Introduction: Electroconvulsive therapy is considered as a first line treatment as recommended by the American psychiatric association (APA), for patients with severe depression, acute mania, mood disorders with psychiatric feature and catatonia. The introduction of ultra-short acting intravenous anaesthetic drugs and muscle relaxant particularly succinyl choline in clinical practice gave way for modified ECT with lesser complications. There is always a need of ideal anaesthetic agent which has rapid, smooth induction, short duration of action, minimal effects on seizures duration, compatible with antipsychotic drugs, minimal side effects, and rapid recovery. The present study aims to compare the effectiveness of thiopentone and propofol as an intravenous agent for modified ECT in view of induction characteristics, hemodynamic parameters, seizure duration, recovery characteristics, and adverse effects.

Methods: The present study was conducted by department of Anaesthesiology at tertiary care centre amongst 70 patients with ASA grade I and II of either sex, between 18- 60 years undergoing electroconvulsive therapy during Feb.2023 to Sept. 2024. The patients were randomly divided into two equal groups, Group T (Thiopentone): 35 patients were given Inj. Thiopentone 3-5 mg/kg for ECT and Group P (Propofol): 35 patients were given Inj. Propofol 1.5-2 mg/kg for ECT. Following parameters were monitored- Time and the dose of the induction agent required for loss of eye lash reflex/loss of verbal contact for Thiopentone and Propofol. Noninvasive blood pressure, heart rate, SpO2, ECG were monitored prior to induction, immediately after induction and at 0, 5, 10, 15 and 30 minutes after ECT convulsions. Duration of seizure and time for return of spontaneous ventilation after apnea.

Results: Induction was rapid with Propofol (40.83 ± 1.44 in seconds) as compared to Thiopentone (47.80 ± 4.44 in seconds) which was statistically significant (P<0.001). Seizure duration was less in the Propofol group (39.26±1.70) compared to Thiopentone group (40.60±4.49) but it was statistically not significant. There was no statistically significant difference in heart rate, systolic and diastolic blood pressure before and after induction. Thus, in our study we found significant change in heart rate, systolic blood pressure, and diastolic blood pressure in both the groups after administration of ECT followed by decreasing trend by the end of 15 min and reaching back to baseline values by the end of 30 min. Time needed for return of spontaneous breathing was less with Propofol (115.14±2.39 sec) compared to Thiopentone (120.54±5.15 sec) with statistical significance (P<0.001).

Conclusion: We finally concluded that, Propofol provides fast smooth induction, better hemodynamic stability, early smooth recovery, and less adverse effects as compared to Thiopentone making it as an agent of choice for modified ECT.

Keywords: Propofol, Thiopentone, Seizure, Electroconvulsive Therapy, Depression.

Introduction

Modified electro convulsive therapy (ECT) for major depressive disorder has established its efficacy and effectiveness as an evident based practice. Electroconvulsive therapy is considered as a first line treatment as recommended by the American psychiatric association (APA), for patients with severe depression, acute mania, mood disorders with psychiatric feature and catatonia. [1]

The introduction of ultra-short acting intravenous anaesthetic drugs and muscle relaxant particularly succinyl choline in clinical practice gave way for modified ECT with lesser complications. Typically,

the acute phase of ECT is performed three times a week for 6 – 12 treatments. Electroconvulsive therapy produces severe transient disturbances which can lead to dangerous sequel in patients who have cardiac and cerebrovascular diseases and undiagnosed illness in elderly.[4] There is always a need of ideal anaesthetic agent which has rapid, smooth induction, short duration of action, minimal effects on seizures duration, compatible with antipsychotic drugs, minimal side effects, and rapid recovery. Various anaesthetic drugs like methohexital, Thiopentone sodium, propofol and etomidate were used. [2]

The goal of anaesthetic agents in ECT is to get an unconscious patient with muscle paralysis and amnesia to decrease its hyperdynamic response. The most used intravenous anaesthetic propofol provides rapid onset and offset. At therapeutic doses, propofol produces a moderate depressant effect on ventilation. It has a short half-life with rapid onset and recovery, maintain hemodynamic stability and have no interference with seizure duration or seizure threshold.

A unique action of propofol is its antiemetic effect, which remains present at concentrations less than those producing sedation. Besides smooth induction, good anticonvulsant activity, attenuation of haemodynamic response, antiemetic and bronchodilator property, propofol causes rapid recovery though slight decrease in seizure duration. Thiopentone sodium, also known as thiopental, is a potent short-acting barbiturate with a long history of use in anaesthesia, including its application in electroconvulsive therapy (ECT). [3]

Thiopentone plays a crucial role in inducing and maintaining anaesthesia during ECT procedures. The mechanism of action of thiopentone sodium involves enhancing the inhibitory effects of gamma-aminobutyric acid (GABA), a neurotransmitter that reduces neuronal excitability. By facilitating GABAergic neurotransmission, thiopentone sodium produces sedation, hypnosis, and muscle relaxation, creating an optimal environment for the administration of ECT. It has rapid smooth induction, good anticonvulsant activity, less effects on seizure duration but associated with side effects like prolonged awakening time, arrhythmias, laryngeal spasm, porphyria, hypersensitivity to thiopentone sodium and post ECT nausea and vomiting. Propofol can be used where Thiopentone is contraindicated. [4]

The present study aims to compare the effectiveness of thiopentone and propofol as an intravenous agent for modified ECT in view of induction characteristics, hemodynamic parameters, seizure duration, recovery characteristics, and adverse effects.

Material and Method

The present Quasi experimental study was conducted by department of Anaesthesiology at tertiary care centre amongst 70 patients with ASA grade I and II of either sex, between 18- 60 years undergoing electroconvulsive therapy. The study was conducted from Feb.2023 to Sept. 2024.

The patients were randomly divided using complete enumeration method into two equal groups with 35 patients in each group.

1. **Group T** (Thiopentone): 35 patients were given Inj. Thiopentone 3-5 mg/kg for ECT.
2. **Group P** (Propofol): 35 patients were given Inj. Propofol 1.5-2 mg/kg for ECT.

Inclusion criteria: patient and relatives giving consent, ASA grade I and II patient of either gender, patient undergoing modified electroconvulsive therapy, no known history of allergy, sensitivity, or other form of reaction to anaesthetic drugs

Exclusion criteria: Patient/Relative refusal to give consent

- ASA grade 3 or above, Pregnancy, Allergy to any of the study drugs, patient with respiratory disorders, epilepsy, uncontrolled hypertension, cardiovascular diseases, h/o MI in last six months, Patients on drugs which may alter the haemodynamic parameters were excluded, Neuromuscular problem, Patient with full stomach.

Data collection: Pre anesthetic checkup was done a day before the surgery. All the resuscitation and monitoring equipment's and drugs were kept ready in the operation theatre for management of any adverse event. On the day of procedure, patients were taken to procedure room and all monitors were attached to the patients such as ECG, spo2 probe, BP cuff and the baseline values were recorded. The premedication that was given to the patients were inj glycopyrrolate 0.2 mg iv & inj ondansetron 0.15mg/kg iv. After preoxygenation with 100% oxygen for 3 min. Patients in group P were given Inj. Propofol 1.5-2mg/kg IV as induction agent and in group T were given Inj. Thiopentone 3-5mg/kg, till loss of eyelash reflex. Then Inj. Succinyl choline 0.5mg/kg was given for neuromuscular blockade to reduce muscle contraction associated with ECT induced seizure activity. Controlled ventilation was given with facemask and Bains circuit with 100% Oxygen. Bitemporal ECT electrodes were placed and connection to ECT machine with proper setting was done. When fasciculations subsided, adequate muscle relaxation obtained, patient was ready to receive ECT. A bite block was placed before application of the electrical stimulus to protect patient's teeth and minimize the risk of laceration of the tongue and patient held tight for immobilization

to prevent fracture and other complications. ECT was given in range of 60Hz-120Hz using brief pulse wave ECT machine. Positive pressure ventilation was resumed after seizure activity and continued till the patient resumed spontaneous and regular respiration.

Following parameters were monitored

a. **Induction characteristics:** Time and the dose of the induction agent required for loss of eye lash reflex/loss of verbal contact for Thiopentone and Propofol. Thiopentone was given at a dose of 3-5mg/kg and Propofol was given as 1.5-2mg/kg. The time from injecting the anaesthetic drug to the time of loss of eyelash reflex/loss of verbal contact was recorded.

b. **Hemodynamic parameters:** Noninvasive blood pressure, heart rate, SpO2, ECG were monitored prior to induction, immediately after induction and at 0, 5, 10, 15 and 30 minutes after ECT convulsions.

c. **Seizure characteristics:** Duration of seizure- Duration of seizure was recorded from the time of application of electric shock till the cessation of tonic clonic seizures. Seizure threshold – 60-120 Hz

d. **Recovery characteristics:** Time for return of spontaneous ventilation after apnea. The time from onset of apnea after induction by anaesthetic drug to the return of spontaneous ventilation was recorded. Time of eye opening on command. The time from loss of eyelash reflex till the return of eye opening on command was recorded. Orientation to the time, place, and person

e. **Adverse effects:** Nausea and vomiting.

Patients were shifted to recovery room once consciousness and spontaneous ventilation was regained.

Results

Table 1: Comparison of doses of inducing agent between two interventions (N=70)

Variable	Parameter	Group T (n = 35)	Group P (n = 35)	Total (N = 70)	P value
Dose of Induction Agent (mg)	Mean ± SD	173.57 ± 21.81	77.14 ± 17.96	125.36 ± 52.46	<0.001
Dose of Suxamethonium (mg)	Mean ± SD	30.43 ± 3.51	32.86 ± 8.93	31.64 ± 6.85	0.14

Table no.1 shows that the, the mean dose of the induction agent administered was significantly higher in Group T, with a value of 173.57 ± 21.81 mg, compared to 77.14 ± 17.96 mg in Group P. This difference was found to be statistically significant ($p < 0.001$). The findings reflect the differing pharmacodynamic profiles of the two agents and their respective dosing requirements for effective induction.

Table 2: Comparison of onset of action (time required for loss of eyelash reflex/verbal contact) between two groups

Variable	Group P (n = 35)	Group T (n = 35)	Total (N = 70)	P value
Time Required for Loss of Eyelash Reflex / Verbal Contact (seconds)	40.83 ± 1.44	47.80 ± 4.44	44.31 ± 4.81	<0.001

Table no.1 shows that the, onset of action between Group T and Group P based on the time required for loss of eyelash reflex or verbal contact. The mean time to loss of reflex was significantly shorter in Group P, recorded at 40.83 ± 1.44 seconds, compared to 47.80 ± 4.44 seconds in Group T. The overall mean for all participants was 44.31 ± 4.81 seconds. This difference was statistically significant ($p < 0.001$), indicating a faster onset of action with propofol compared to thiopentone. This finding highlights the rapid induction property of propofol, making it more suitable in scenarios where quicker loss of consciousness is desired.

Table 3: Comparison of seizure characteristics between two groups (N=70)

Variable	Group P (n = 35)	Group T (n = 35)	Total (N = 70)	P value
Seizure Duration (seconds)	39.26± 1.70	40.60 ± 4.49	39.93 ± 3.44	0.10
Seizure Threshold (mC)	99.43 ± 21.95	94.86 ± 19.00	97.14 ± 20.51	0.36

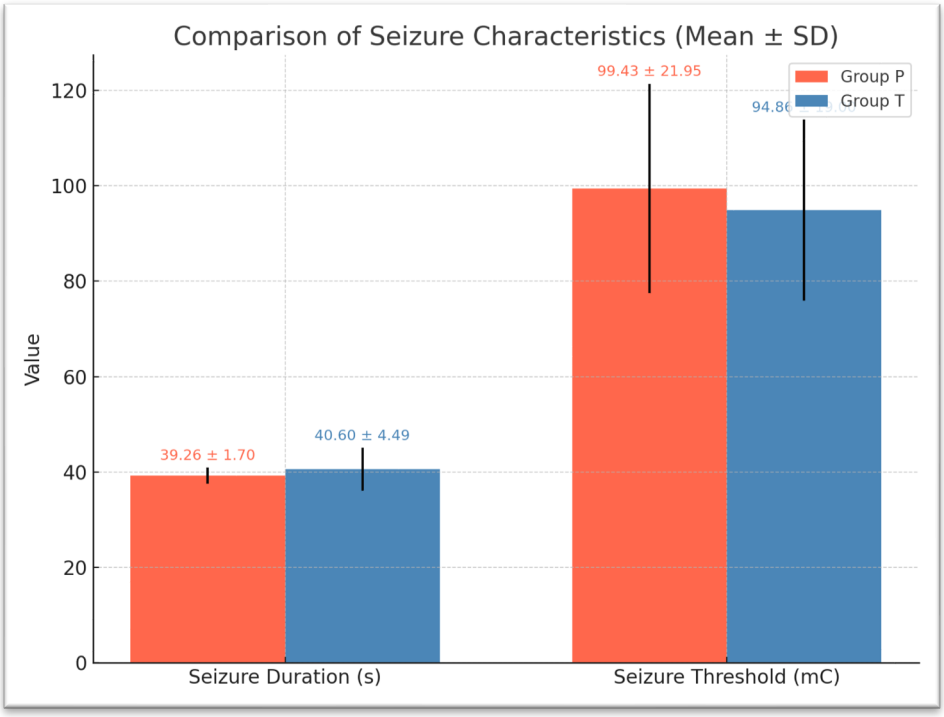

Figure 1: Comparison of seizure duration and threshold between two groups

Table no.3 and graph no.1, compared seizure characteristics between Group T and Group P, each consisting of 35 participants. The mean seizure duration in Group P was 39.26 ± 1.70 seconds, while in Group T it was slightly longer at 40.60 ± 4.49 seconds. The combined mean seizure duration for all participants was 39.93 ± 3.44 seconds. However, the difference in seizure duration between the two groups was not statistically significant (p = 0.10). This difference was also not statistically significant (p>0.05).

Table 4: Comparison of recovery parameters between two groups (N=70)

Variable	Group P (n = 35)	Group T (n = 35)	Total (N = 70)	P value
Time of Return of Spontaneous Ventilation (seconds)	115.14 ± 2.39	120.54 ± 5.15	117.84 ± 4.83	<0.001
Time of Eye Opening on Command (seconds)	170.11 ± 2.70	178.60 ± 9.89	174.36 ± 8.37	<0.001
Orientation to Time, Place, and Person (seconds)	429.14 ± 1.99	457.09 ± 1.82	443.11 ± 14.20	<0.001

Table no.4 and figure no.1 presents a comparison of key recovery parameters between the two intervention groups—Group T and Group P. The time of return of spontaneous ventilation was significantly shorter in the propofol group (115.14 ± 2.39 seconds) compared to the thiopentone group (120.54 ± 5.15 seconds), with a statistically significant difference (p < 0.001). These findings suggested that patients induced with propofol recovered more rapidly following electroconvulsive therapy compared to those who received thiopentone. The orientation to time, place, and person was significantly delayed in the thiopentone group (457.09 ± 1.82 seconds) compared to the propofol group (429.14 ± 1.99 seconds), with the difference reaching strong statistical significance (p < 0.001). This suggests that patients who received propofol regained cognitive orientation faster than those who received thiopentone

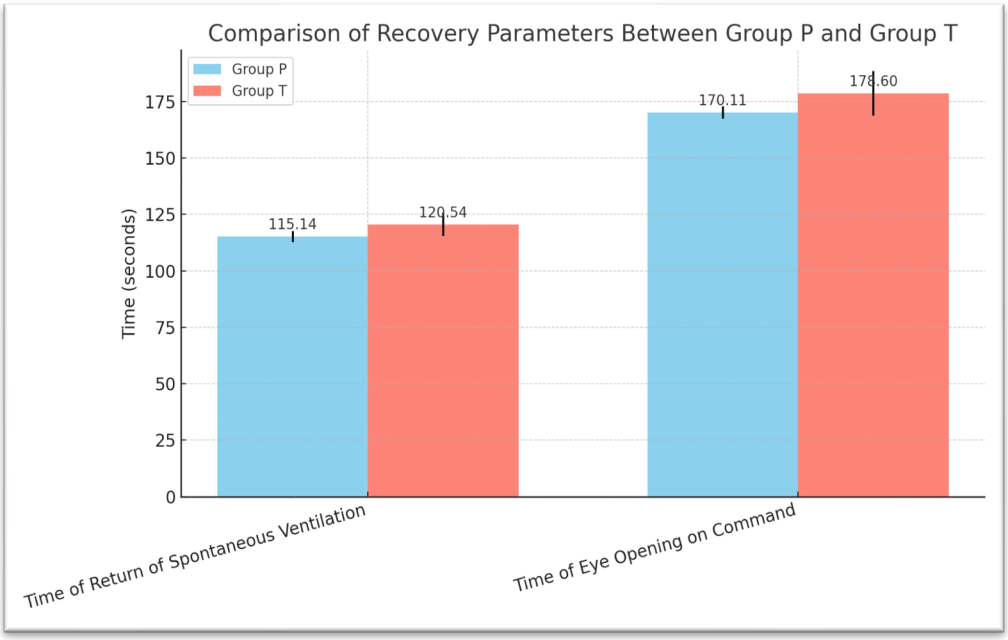

Figure 2: Comparison of recovery parameters between two groups (N=70)

Table 5: Comparison of heart rate at various time interval between two groups

Time Point	Group T (Mean ± SD)	Group P (Mean ± SD)	Total (Mean ± SD)	P value
Before Induction	76.31 ± 5.76	77.03 ± 5.19	76.67 ± 5.45	0.59
After Induction	74.63 ± 5.77	75.77 ± 5.24	75.20 ± 5.50	0.39
Immediately After ECT (0 min)	149.86 ± 3.21	140.31 ± 4.19	145.09 ± 6.07	<0.001
5 Minutes	139.69 ± 4.78	131.57 ± 4.49	135.63 ± 6.16	<0.001
10 Minutes	130.14 ± 3.35	122.86 ± 2.83	126.50 ± 4.79	<0.001
15 Minutes	104.03 ± 2.09	102.00 ± 2.87	103.01 ± 2.69	0.001
30 Minutes	80.80 ± 2.34	78.57 ± 4.36	79.69 ± 3.65	0.010

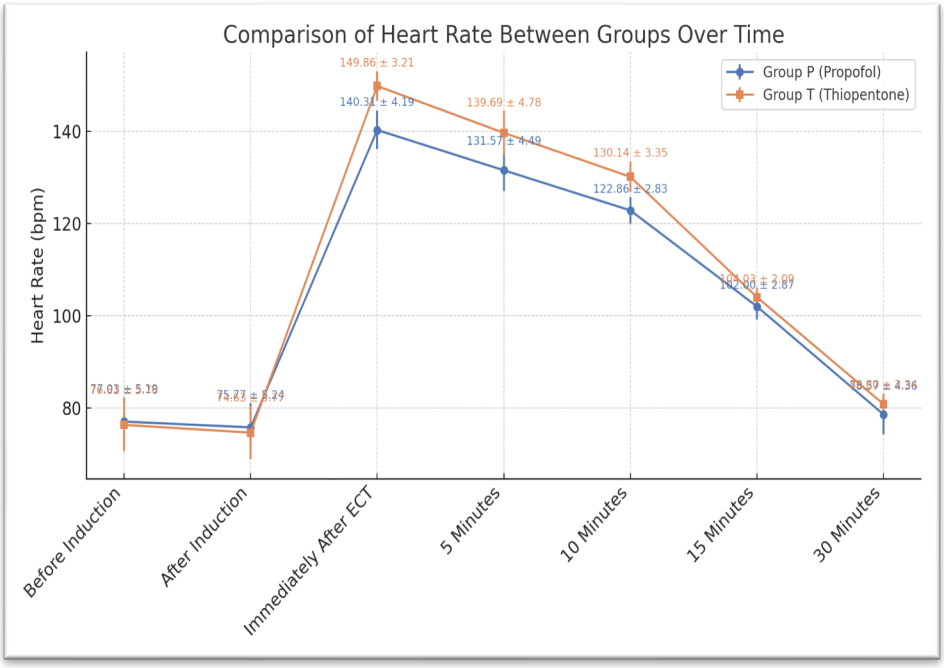

Figure 2: Comparison of Heart rate at various time interval between two groups (N=70)

Table no. 5 and Figure no. 2, presented the comparison of heart rate (HR) measurements between Group T and Group P at various time points before and after electroconvulsive therapy (ECT). Prior to induction, the mean HR was similar in both groups (76.31 ± 5.76 bpm in Group T vs 77.03 ± 5.19 bpm in Group P; p = 0.59). A comparable pattern was also observed after induction (p = 0.39). However, significant differences were noted following ECT. Immediately after ECT, the HR was significantly higher in Group T (149.86 ± 3.21 bpm) compared to Group P (140.31 ± 4.19 bpm), with a p value of <0.001. This trend of statistically significant elevation in HR in Group T continued at subsequent time points: at 5 minutes (139.69 ± 4.78 vs. 131.57 ± 4.49 bpm; p < 0.001), 10 minutes (130.14 ± 3.35 vs. 122.86 ± 2.83 bpm; p < 0.001), and 15 minutes (104.03 ± 2.09 vs. 102.00 ± 2.87 bpm; p = 0.001). Even at 30 minutes post-ECT, the HR remained significantly higher in Group T compared to Group P (80.80 ± 2.34 vs. 78.57 ± 4.36 bpm; p = 0.010).

Table 6: Comparison of systolic blood pressure at various time interval between two groups

Time Point	Group P (Mean ± SD)	Group T (Mean ± SD)	Total (Mean ± SD)	P value
Before Induction	120.97 ± 1.34	121.00 ± 0.87	120.99 ± 1.12	0.92
After Induction	119.77 ± 0.49	120.00 ± 1.33	119.89 ± 1.00	0.34
Immediately After ECT	141.11 ± 1.62	150.00 ± 0.91	145.56 ± 4.66	<0.001
5 Minutes	135.91 ± 1.44	140.09 ± 1.12	138.00 ± 2.46	<0.001
10 Minutes	129.86 ± 1.14	134.03 ± 0.95	131.94 ± 2.35	<0.001
15 Minutes	124.51 ± 0.98	129.14 ± 0.81	126.83 ± 2.50	<0.001
30 Minutes	121.03 ± 1.38	123.03 ± 1.27	122.03 ± 1.66	<0.001

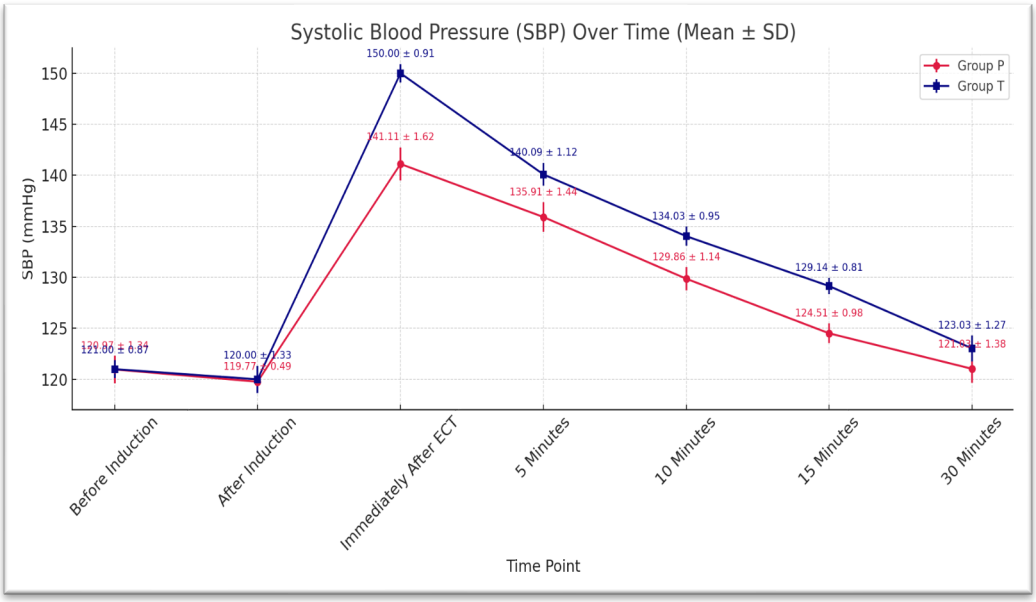

Figure 3: Comparison of SBP at various time interval between two groups

Table no. 6 and Figure no. 3, presented the comparison of systolic blood pressure (SBP) between Group T and Group P at various time points during the peri-ECT period. Before induction, the mean SBP was slightly lower in Group P (120.97 ± 1.34 mmHg) compared to Group T (121.00 ± 1.12 mmHg), and this difference was statistically insignificant (p=0.92). A similar insignificant difference persisted after induction, with Group P showing a lower SBP (119.77 ± 0.49mmHg) than Group T (120.00 ± 1.33 mmHg; p = 0.34).

Immediately following ECT, the rise in SBP was more pronounced in Group T (150.00 ± 0.91 mmHg) compared to Group P (141.11 ± 1.62 mmHg), a difference that was highly significant (p < 0.001). This trend continued at subsequent intervals. At 5 minutes post-ECT, the SBP remained significantly higher in Group T (140.09 ± 1.12 mmHg) compared to Group P (135.91 ± 1.44 mmHg). At 10 minutes, Group T maintained an elevated SBP (134.03 ± 0.95 mmHg) relative to Group P (129.86 ± 1.14 mmHg), with p < 0.001.

At 15 minutes and 30 minutes post-ECT, Group T continued to demonstrate significantly higher SBP values (129.14 ± 0.81 mmHg and 123.03 ± 1.27 mmHg, respectively) compared to Group P (124.51 ± 0.98 mmHg and 121.03 ± 1.38 mmHg, respectively), with p < 0.001 for both comparisons.

These findings indicated that patients receiving thiopentone exhibited a more pronounced hypertensive response following ECT compared to those receiving propofol.

Table 7: Comparison of DBP at various time interval between two groups (N=70)

Time Point	Group T (Mean ± SD)	Group P (Mean ± SD)	Total (Mean ± SD)	P value
Before Induction	74.86 ± 2.56	74.77 ± 1.17	74.81 ± 1.97	0.86
After Induction	73.03 ± 1.84	72.14 ± 1.22	72.59 ± 1.61	0.020
Immediately After ECT	100.71 ± 3.03	97.49 ± 0.98	99.10 ± 2.76	<0.001
5 Minutes	95.51 ± 1.80	93.09 ± 1.82	94.30 ± 2.18	<0.001
10 Minutes	90.03 ± 1.82	88.03 ± 2.13	89.03 ± 2.21	<0.001
15 Minutes	86.46 ± 1.80	84.26 ± 1.12	85.36 ± 1.86	<0.001
30 Minutes	75.40 ± 1.87	72.49± 0.82	73.94 ± 2.05	<0.001

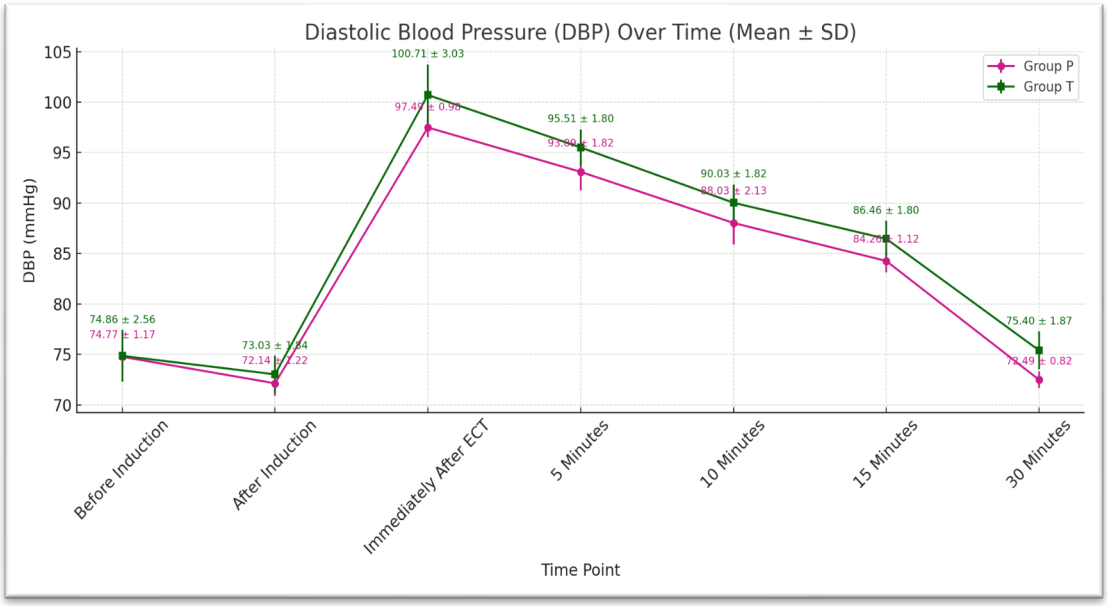

Figure 4: Comparison of DBP at various time interval between two group (N=70)

Table no. 7 and Figure no. 4, compared diastolic blood pressure (DBP) values between Group T and Group P at various peri-ECT time intervals. Before induction, DBP values were comparable between the two groups, with Group P showing a mean of 74.77 ± 1.17 mmHg and Group T 74.86 ± 2.56 mmHg (p = 0.86). However, after induction, a statistically significant difference emerged, with Group T exhibiting a higher DBP (73.03 ± 1.84 mmHg) compared to Group P (72.14 ± 1.22 mmHg; p = 0.020). Following ECT, Group T consistently demonstrated significantly elevated DBP values across all time points. Immediately after ECT, the mean DBP was 100.71 ± 3.03 mmHg in Group T versus 97.49 ± 0.98 mmHg in Group P (p < 0.001). At 5 minutes post-ECT, Group T maintained a higher DBP (95.51 ± 1.80 mmHg) compared to Group P (93.09 ± 1.82 mmHg; p< 0.001). Similarly, at 10 minutes and 15 minutes, the DBP remained significantly greater in Group T (90.03 ± 1.82 mmHg and 86.46 ± 1.80 mmHg) than in Group P (88.03 ± 2.13 mmHg and 84.26 ± 1.12 mmHg), both with p < 0.001.

At the 30-minute time point, the mean diastolic blood pressure (DBP) in Group P was 72.49 ± 0.82 mmHg, while in Group T it was higher at 75.40 ± 1.87 mmHg. The combined mean for both groups was 73.94 ± 2.05 mmHg. The difference between the two groups at this time point was statistically significant, with a p-value of less than 0.001

Discussion

In the present study we compared Thiopentone and Propofol as induction agents in modified ECT with respect to following: 1. Induction characteristics, 2. Hemodynamic stability, 3. Seizure characteristics, 4. Recovery characteristics and 5. Adverse effects.

Age: In our study, the mean age of patients in Group T was 26.86±7.25 yrs and those in Group P was 27.20±7.11 yrs (p = 0.84). There was no statistically significant difference between the mean age of two groups.

Sex: In present study, Group T had 25 (71.4%) male cases and 10 (28.6%) were female cases where in

Group P 21(60%) were male cases and 14(40%) were female cases. No significant difference was observed in the gender distribution of the cases between the groups (P-Value=0.31).

Weight: The mean weight of patients in Group T was 63.43±3.39 kg and in Group P was 64.09±4.79 kg which was statistically insignificant. (p= 0.51).

ASA Grading: The ASA grading showed no statistical difference between the two groups with p value being 0.52. Patients from both the groups belonged to ASA I and ASA II. Thus, in our study there was no any significant difference in the demographic profile.

Kazi A et al [5] compared and found the mean age between Group T (32.6 ±9.37 yrs) and Group P (37.3 ±14.52 yrs) which was statistically insignificant(p=0.295). The weight of patients in Group T (52.11 ±11.70 kg) and Group P (53.79 ±11.17 kg) was not statistically significant(p=0.667). They also found no significant difference in the demographic profile similar to our study.

Anupama Gupta et al [6] observed that the mean age of patients in Group T (28.1 ± 6.4 yrs) and Group P (29.1±6.7 yrs) was not statistically significant(p=0.5). The weight of patients in Group T (58.7±5.6 kg) and Group P (59.1±6.0 kg) was not statistically significant(p=0.3). Both the groups had ASA grade I and II patients with no statistically significant difference (p=0.33).

Induction Characteristics: The induction characteristics were compared in relation to time required for loss of eyelash reflex/verbal contact and the results showed Induction was rapid with Propofol (40.83 ± 1.44 in secs) as compared to Thiopentone (47.80 ± 4.44 in secs) which was statistically significant (P<0.001*). This suggests that Propofol has faster induction than Thiopentone.

Mir et al (2017) [7] found Induction time with Propofol to be earlier (41.9 ± 3.5 secs) than that for Thiopentone (48 ± 3.9secs) which was statistically significant (P < 0.001*) which was comparable with our study. Shah et al (2010) [4] found Induction was quicker in Propofol group (41.03 ± 6.11 secs) than in Thiopentone (50.6 ± 6.32 secs) and was found to statistically significant with p (<0.05*) which was similar to our study. Daria et al (2012) [8] found that mean induction time was significantly less in Propofol 40.4 secs as compared to Thiopentone 49.4 secs (p=0.044*). Jignesh D. Patel et al (2015) [9] observed Induction to be rapid with Propofol (41.9 ± 5.21 secs) as compared to Thiopentone (47.40 ± 5.68 secs) which was statistically significant (P<0.05*) and comparable with our study. Arya et al (2008) [10] also found Induction with Propofol to be significantly faster (41.13± 6.11 secs) compared to Thiopentone sodium (51.06 ± 6.82 secs) which was similar to our study.

Hemodynamic Parameters: In our study there was no any statistically significant difference in heart rate, systolic and diastolic blood pressure before and after induction. There was significant difference in the systolic blood pressures recorded at 0 min and 5 min, 10 min, 15 min after ECT convulsions between the two groups with p values (p<0.0001*, p=0.0158*, p=0.0136*, p=0.0005*) respectively. There was significant difference in the diastolic blood pressures recorded at 0 min,5 min, 10 min, 15 min after ECT convulsions between two groups with p values of {p=0.038*, p=0.044*, p=0.034*, p=0.023*} respectively. Thus, in our study we found significant change in heart rate, systolic blood pressure and diastolic blood pressure in both the groups after administration of ECT followed by decreasing trend by the end of 15 min and reaching back to baseline values by the end of 30 min. However, there was a less rise in heart rate with Propofol as compared to Thiopentone. The hemodynamic changes during ECT involve sequential increase in parasympathetic and sympathetic nervous system activity. The anaesthetic used during ECT has an important impact on the hemodynamic response. These results confirm that Propofol provides the better protection against an untoward hypertensive response to ECT, while Thiopentone is less effective in blunting the haemodynamic response.

Altaf Hussain Mir et al [7] also found significant change in heart rate, SBP and DBP from baseline value after the administration of ECT. (P<0.05) followed by reaching to baseline in30 minutes which was similar to our study. Hamid Kayalha et al [11] also found similar changes in the hemodynamic parameters as of our study. Kumar et al [12] noted, an increase in all hemodynamic parameters after the procedure, mean heart rate (80 ± 14 bpm vs. 76 ± 14 bpm), systolic blood pressure (98 ± 17 mmHg vs. 91 ± 11 mmHg) in group P. In group T too, a similar trend of increase in all hemodynamic parameters was seen after the procedure, Heart rate (81 ± 12 bpm vs. 70 ± 11 bpm), systolic blood pressure (119 ± 11 mmHg vs. 100 ± 12 mmHg) However, the percentage increase was significantly greater in group T as compared to group P (P < 0.05*) which was comparable to our study.

Jignesh D Patel et al [9] found In P group, an increase in all hemodynamic parameter seen after the procedure, mean heart rate (94.00± 10.52 bpm vs 107.17 ± 11.58 bpm), SBP (121.93 ±10.35 mmHg vs 132.47 ±11.50 mmHg), DBP (75.87 ± 6.69 mmHg vs 85.67 ± 7.95 mmHg). In T group too, a similar trend of increase in all hemodynamic parameters was seen after the procedure, mean heart rate (98.20 ± 14.94 bpm vs 115.03 ± 12.71 bpm), SBP (130.10 ± 10.99 mmHg vs 140.33 ±8.53

mmHg), DBP (84.13 ± 9.31 mmHg vs 90.27 ± 8.49 mmHg). However, the percentage increase in each of the variables following the procedure was significantly greater in T group as compared to P group.

Oxygen saturation: There was no any significant change in spo2 between the two groups. Altaf Hussain Mir et al, [7] Jignesh D Patel et al,[9] Boey and Lai,[13] Arya et al,[10] and Shah et al [4] also found no any change in spo2 throughout the procedure which was comparable to our study.

Seizure Parameters: In the present study, seizure duration was less in the Propofol group (39.26±1.70 sec) compared to Thiopentone group (40.60±4.49 sec) but there was no any statistically significant difference between the two groups (p=0.10). The potent anticonvulsive property of Propofol might be a potential mechanism for the less duration of seizures with the electrical stimulus. However, this did not affect the therapeutic outcome.

Jignesh D Patel et al [9] in their study found duration of seizure to be less in P group (17.07 sec) than in T group (19.53 sec) but without any statistically significant difference. (P >0.05). There was no effect of reduced seizure duration with Propofol on outcome of the therapy or effectiveness of ECT. Daria et al [8] found mean seizure duration to be less in propofol (25.6 sec) than Thiopentone (28.1 sec) without any significant difference which was comparable to our study. Mir et al[7] found mean duration of seizure to be 27.6±4.7 sec with Propofol compared to Thiopentone 30.2±5.4 sec (p>0.05) which was not statistically significant which was similar to our study. Zaidi et al [14] The mean duration of seizure was 31.08 ± 4.13 sec with Thiopentone and 23.76 ± 3.38 sec with Propofol which was found to be statistically significant. (p<0.001*).

Recovery Parameters: In this study we observed the time for return of spontaneous breathing to be less with Propofol (115.14±2.39 sec) compared to Thiopentone (120.54±5.15 sec) which was statistically significant. (P<0.001). Time for eye opening on command was less with Propofol (170.11±2.70sec) compared to Thiopentone (178.60±9.89sec) which was statistically significant. (p<0.001). Time for orientation to time, place or person was less with Propofol (429.14±1.99 sec) than Thiopentone (457.09±1.82 sec) and showed statistical significance (p<0.001). Thus, in our study we found faster recovery with Propofol than Thiopentone.

Many studies support our findings of faster recovery.

Mir et al [7] in the study also found that, the recovery of cognition, orientation, was significantly fast in Propofol group (P < 0.001*). Daria et al [8] in the study also found that, recovery time was significantly less in Propofol group (22.1±2.5sec) compared to Thiopentone group (28.9±3.2sec) (p=0.015*). Shah et al [4] also observed a significant difference in recovery time among the Propofol group and Thiopentone group. (P<0.05*).

Adverse effects: In our study the occurrence of nausea was slightly higher in Group T (5.7%) compared to Group P (2.9%), but this difference was not statistically significant (p = 0.56). There was no incidence of vomiting in both groups among the study participants (p = 1.00).

Shah et al [4] found that the incidence of nausea and vomiting was almost nil in Propofol as compared to 23.33% in Thiopentone. Omprakash TM et al [15] also found that nausea and vomiting was more with Thiopentone as compared to Propofol.

Conclusion

The present study concluded that: There was no statistically significant difference in demographic profile among two groups. Induction was faster and smooth in Group P as compared to Group T and was statistically significant. Propofol was found to be more haemodynamically stable than Thiopentone. No statistically significant difference was seen in saturation level of both groups. Seizure duration was less in Group P as compared to Group T but it was statistically insignificant. Recovery was faster in Group P as compared to group P and it was statistically significant. Incidence of nausea/vomiting was more in Group T as compared to Group P but it was statistically insignificant. We finally conclude that, Propofol provides fast smooth induction, better hemodynamic stability, early smooth recovery, and less adverse effects as compared to Thiopentone making it as an agent of choice for modified ECT.

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