

VALUE OF PROPANIDID IN ELECTRO CONVULSIVE THERAPY (COMPARISON WITH THIOPENTONE)

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SUMMARY

Propanidid due to its fast induction, early recovery and absence of cumulative action avoiding post-recovery hangover is a useful agent and a better substitute for the established inducing agent, thiopentone. It has all the advantages of thiopentone but lacks the disadvantages of the same. Its extremely short duration of action suits the short procedure of electroconvulsive therapy which gets over within one or two minutes. Use of propanidid will allow more number of E. C. Ts to be given in outpatient department and will help in reducing the load on the hospital staff without compromising the safety of the patients.

Propanidid is a non-barbiturate intravenous inducing agent with shorter duration of action as compared to thiopentone and recovery is not followed by hangover. (Dundee and Wyant, 1974). It was first used in clinical practice in 1956 and was found useful for short procedure carried out in out patient department (Clark and Swardlow, 1966). Unlike thiopentone, it has no cumulative property but shares the property of fast induction with thiopentone. (Clark and Dundee, 1966).

The present study was undertaken to evaluate the exact place of propanidid in electroconvulsive therapy and to determine comparative length of post-anaesthetic care required for the patients after the use of propanidid and thiopentone.

MATERIAL AND METHOD

Forty patients of both sexes, (M=32, F=8), ranging in age from 15-55 years, suffering from psychiatric disorders and found suitable for electroconvulsive therapy were selected at random for the study. The average body weight of the patients was 47 kgs.

Out of these forty patients, thirty-six patients were taking chlorpromazine hydrochloride, trifluoperazine hydrochloride, trihexyphenidyl hydrochloride combination

and four patients were taking chlorpromazine hydrochloride, amitriptyline hydrochloride combination. The patients in this series had taken E.C.Ts. before. The number of E.C.Ts. taken varied from 1 to 3, all of which were without anaesthesia.

In this group of forty patients, each patient received thiopentone as an inducing agent on first two electroconvulsive therapies and propanidid on next two occasions. Each patient served as his own control as the study was designed as a controlled one with cross over design.

All the patients were premedicated on the table with atropine 0.6 mg intravenously 3 minutes before the start of induction. Patients were divided in two groups according to the inducing agent.

The group 'T' patients were induced with a 2.5% solution of thiopentone sodium (4-5 mg/kg body weight). The group 'P' patients were induced with a 5% solution of propanidid (5 mg/kg body weight). All the drugs were injected in a vein on the dorsum of the hand or radial side of the forearm with a 20 gauge needle in order to standardise the rate of injection. Satisfactory induction was assumed by loss of eyelash reflex. Suxamethonium was used to produce muscle relaxation in both the groups. (1 mg/kg body weight). Patients

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were ventilated with the help of oxford inflating bellows and face mask. When maximum relaxation was obtained, a prop was placed between the upper and lower teeth of the patient and electric current of 120 volts was applied with the help of E.C.T. machine for a period of 0.5 seconds. After the disappearance of electrically induced convulsions, the patients were again ventilated till the return of spontaneous respiration. Then the patients were shifted to the recovery room and observed there. They were allowed to return to the ward or go home only when they could walk steadily and were judged fit for ambulation.

OBSERVATIONS AND RESULTS

The following observations were noted :

Induction of anaesthesia was satisfactory in all the patients in both the groups as indicated by loss of eyelash reflex. There was no significant change in pulse rate as well as blood pressure after the administration of the induction agent in both the groups. In both the groups blood pressure returned to the pre-induction level after cessation of convulsions.

Grading of modification of convulsions is shown in Table no. 1.

Grade- I—Goose skin

Grade- II—Twitching of facial muscles and toes.

Grade- III—Soft generalised convulsions.

Grade IV—Unmodified convulsions.

TABLE No. 1—Grading of Intensity of Convulsions

Grade	Group T N	%	Group P N	%
I	40	100	40	100
II	34	85	35	87.5
III	6	15	5	12.5
IV	0	0	0	0

It is seen from Table no. 1 that in both the groups convulsions were well

modified and no patient had unmodified convulsions.

Various periods were measured to assess the onset and duration of action of suxamethonium as shown in Table no. 2.

TABLE No. 2—Apnoea Period

		Group 'T'	Group 'P'
Onset time in sec.	Mean	44 sec.	43 sec.
	Range	25-75 sec.	30-60 sec.
True Apnoea	Mean	147.8 sec.	172 sec.
	Range	115-175 sec.	140-210 sec.
Duration of depressed respiration	Mean	267.7 sec.	338 sec.
	Range	190-380 sec.	240-500 sec.

- (i) *Onset time*—Period from injection of suxamethonium to onset of its action.
- (ii) *Duration of depressed respiration*—Period from injection of suxamethonium to establishment of adequate respiration.
- (iii) *True apnoea*—Period from onset of apnoea to first post—E.C.T. breath.

From the Table it is seen that mean values of all the recorded periods were greater when propanidid was used as an inducing agent, except for onset time which was similar for both the groups.

Duration of true apnoea and depressed respiration was prolonged to a statistically significant degree when propanidid was used as an inducing agent.

Various periods were measured for assessment of recovery from anaesthesia. When propanidid was used both awakening and walking time were shorter. Mean awakening time for propanidid was 6.4 minutes (range 4-8 minutes) and walking time was 10.5 minutes (range 6-15 minutes). When thiopentone was used these periods were increased, mean awakening time was 15.5 minutes and mean walking time was 33 minutes.

Difference between these values for awakening and walking time in these two groups was statistically significant. All

the patients in group 'P' were fully active but those in group 'T' showed a tendency to go to sleep when left undisturbed.

Complications recorded during and after E.C.T. and anaesthesia were divided into two groups :

- (1) Early complications (nausea, vomiting and involuntary passing of urine).
- (2) Late complications (pain at the site of injection and bodyache).

It was observed that the incidence of nausea and vomiting ($P=7.5\%$, $T=2.5\%$), incidence of involuntary passing of urine ($P=50\%$, $T=5\%$) and incidence of pain at the site of injection ($P=5\%$, $T=0\%$) was higher in group 'P'. But the incidence of bodyache was lower in group 'P' than in group 'T'. ($P=5\%$, $T=12.5\%$).

DISCUSSION

The supremacy of the intravenous barbiturates for the rapid induction of anaesthesia has been challenged in recent years by a group of drugs known as eugenol derivatives or phenoxy acetic amines. It has been shown that recovery from these compounds is definitely more rapid than after equivalent doses of thiopentone and that there is an absence of the well known barbiturate hangover. (Dundee & Wyant, 1974) From the observation tables it is seen that induction was satisfactory as judged by the absence of eyelash reflex in all the patients from both the groups. Propanidid caused only minimal cardiovascular changes in these series of patients. Our advantage of propanidid is its antiarrhythmic action. (Johnston and Barron, 1968), which is of particular value during anaesthesia for electroconvulsive therapy.

Duration of true apnoea and depressed respiration was prolonged in group 'P' than in group 'T'. Mean period for the true apnoea in group 'P' was 172 seconds (range 140 to 210 seconds) and that for group 'T' was 147.8 seconds (range 115 to

175 seconds). Difference between period of true apnoea ($P<0.01$) and duration of depressed respiration ($P<0.05$) was statistically significant. For statistical calculation paired 't' test was applied. This prolongation of apnoea period is due to its property of potentiation of action of suxamethonium Clark *et al.*, 1974). But in the present study apnoea period was never prolonged beyond ten minutes in any patient. One disadvantage of the prolongation of suxamethonium apnoea is that sometimes the patient is awake before return of adequate respiration and then the patient may experience a feeling of suffocation.

The results showing early recovery from propanidid anaesthesia are due to its rapid destruction in the body (50% dose is destroyed in 20 minutes) and absence of cumulative action (Clark and Swerdlow, 1966 ; Clark and Dundee, 1966 ; Doenicke *et al.*, 1966 ; Dundee *et al.*, 1967). Early recovery after E.C.T. is more important as unlike other patients, psychiatric patients are less capable of taking care of themselves and so careful watch by some trained personnel is necessary during the recovery period. In the present study it was observed that use of propanidid can significantly reduce this recovery period and can save man power without compromising the safety of the patient.

No major complication was noted in any of the groups. Incidence of nausea, pain at the site of injection and involuntary passing of urine was slightly higher in group 'P' but incidence of bodyache was higher in group 'T'.

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