

## INTRAOCULAR PRESSURE CHANGES FOLLOWING MODIFIED E.C.T.

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### SUMMARY

Intraocular pressure changes following modified ECT with and without succinylcholine were studied in Sixty cases. The pressure rose in both the conditions though the rise was more marked and longer lasting when succinylcholine was used.

Electroconvulsive therapy (E. C. T.) has been occupying a prominent place amongst the therapeutic modalities in psychiatry ever since its discovery (Royal College of Psychiatrists, 1977). Its various aspects have been studied over the past 4-5 decades. However, but for a brief mention (Kalinowsky, 1975), we could not get any report on the effects of ECT on the intraocular pressure. In the present study we have recorded the intraocular pressure variations following modified ECT.

### MATERIAL AND METHOD

The study was carried out in the Psychiatric clinic of MLB Medical College, Jhansi. All the patients submitted to ECT during a period of nine months were included in the study. The cases were scrutinized for any abnormality that might render them unfit for anaesthesia and/or ECT.

The patients received ECT twice a week from Electrocon (Hospital Model) ECT machine through bitemporal electrodes. The treatments were carried out under thiopentone sodium+atropine sulphate and thiopentone sodium+atropine sulphate+succinylcholine chloride on alternate turns till the patient had three treatments under each of these two drug combinations. The doses were 250 mg., 0.6 mg and 1 mg/kg body weight, for thio-

pentone, atropine and succinylcholine respectively.

The intraocular pressures were recorded by Schiotz tonometer. The tension was noted after thiopentone, after succinylcholine (if used), immediately after cessation of convulsions and at intervals of one minute thereafter, so long as the patient remained cooperative.

In every case, the averages of the values on the three visits were calculated for all the readings. If the tension of the two eyes were different, the mean of the two was worked out. At the end of the study the data were tabulated and the findings analysed by using 't' test as test of significance.

### OBSERVATIONS

TABLE I—Age distribution of the cases

Age group (Years)	No.	Percent
10—20	18	30.0
21—30	21	35.0
31—40	10	16.7
41—50	5	8.3
51 and above	6	10.0

Out of the ninety four cases on whom the study was carried out, only 60 could be included in the final analysis since the

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others did not fulfil inclusion criteria. Thirty-five (58.3%) of the cases were males. Their age ranged between 14 and 61 years, maximum no. of cases being in the age group 21-30 yrs (21-30).

The commonest diagnosis was schizophrenia (68.3%), followed by involutional depression (18.4%) and depressive phase of manic depressive psychosis (13.3%).

TABLE II—*Diagnosis of the cases*

Diagnosis	No.	Per cent
Schizophrenia	41	68.3
M.D.P. (Depression)	8	13.3
Involutional Depression	11	18.4

Intraocular pressure readings have been given in Table 3. There was a significant rise of intraocular tension following ECT under both the drug combinations. However, the rise was significantly more pronounced and longer lasting when treatments were given using succinylcholine. Without it the tension returned to the baseline within three minutes while with it, the tension remained significantly raised even after that period.

TABLE III—*Showing Intraocular Pressure Variations*

Readings	Intraocular pressure (mm Hg)		Significance of difference between readings with and without succinylcholine	
	With succinylcholine (mean s.d.)	Without succinylcholine (mean s.d.)	t	p
I. After thiopentone sodium	14.8± 3.7*	14.8± 3.7*	—	—
II. After Succinylcholine chloride	15.6± 4.3	—	—	—
III. Immediately after convulsions	30.2±10.1	20.4±11.7	4.9	<0.01
IV. One minute after convulsions	22.3± 7.3	19.2± 8.3	2.2	<0.05
V. Two minutes after convulsions	18.6± 6.6	16.2± 4.9	2.2	<0.05
VI. Three minutes after convulsions	17.5± 5.1	15.5± 4.5	2.2	<0.05
Significance of difference between readings I and II-VI	t	p	t	p
I and II	0.8	>0.10	—	—
I and III	11.8	<0.001	3.7	<0.01
I and IV	7.5	<0.001	4.0	<0.01
I and V	3.9	<0.01	2.2	<0.05
I and VI	3.3	<0.01	0.9	>0.05

\*Mean was calculated for the six therapeutic sessions, three with and three without succinylcholine.

## DISCUSSION

Electroconvulsive therapy is, by and large, a safe procedure (Slater and Roth, 1969 and Kalinowsky, 1975). With the modified technique, musculo-skeletal injuries, too, seldom occur. However, circulatory failure, cardiac arrest and irregularities, coronary occlusion, prolonged apnoea and even death may occur at times (Hussar and Patcher, 1968; McKenna *et al.*, 1970; Gomez, 1974; Jain *et al.*, 1976; Avery and Winokur, 1977; Shah *et al.*, 1977 and Gordh and Mostert, 1978).

We failed to find any study on the intraocular pressure variations following ECT. Kalinowsky (1975) mentioned just in passing that the intraocular tension decreased after ECT and that the procedure could therefore be safely carried out in patients with glaucoma. However, in the present study we found results exactly contrary to this assertion. Since succinylcholine chloride is known to elevate the intraocular tension on its own (Robertson and Gibson, 1968; Pandey *et al.*, 1972 and Datta *et al.*, 1977), we thought it worthwhile to compare the effects of ECT with and without the drug. Although the tension rose significantly in both the conditions, the rise was much more pronounced and significantly longer lasting when succinylcholine was used.

Since all of our cases had normal baseline readings, we are not in a position to predict the response in patients with glaucoma. Nevertheless, our findings suggest that one should be cautious in giving ECT to such patients, particularly under succinylcholine chloride.

## REFERENCES

- AVERY, D. AND WINOKUR, G. (1977). Mortality in depressed patients treated with ECT and anti-depressants. *Arch. Gen. Psychiat.*, 33, 1029.
- DATTA, P. K., PANDEY, K., JAIN, P. D. AND LAL, A. (1977). Effects of suxamethonium and tracheal intubation on ocular tension after different anaesthetics. *Indian J. Anaesth.* 25, 117.
- GOMEZ, J. (1974). Death after ECT. *Brit. Med. J.*, 2, 45.
- GORDH, T. AND MOSTERT, J. W. (1978). Autonomic sequelae of electroshock under anaesthesia. *Int. Anaesth. Clin.*, 16, 137.
- HUSSAR, A. E. AND PATCHER N. (1968). Myocardial infarction and fatal coronary insufficiency during ECT. *J. A. M. A.*, 204, 146.
- JAIN, R. K., GOYAL, S. P., JAIN, V. K., MEHROTRA, M. P., WAHAL, P. K. AND PRAKASH, V. (1976) E.C.G. changes following electroconvulsive therapy. *Indian J. Psychiat.*, 18, 260.
- KALINOWSKY, L. B. (1975). The convulsive therapies. In *Comprehensive Textbook of Psychiatry*, Vol. II, 2nd edition, Baltimore: Williams and Wilkins.
- McKENNA, G., RALPH, P. E., HAROLD, B. AND JAMES, D. (1970). Cardiac arrhythmias during electroshock therapy. *Am. J. Psychiat.*, 127, 530.
- PANDEY, K., BUDOLA, R. P. AND KUMAR, S. (1972). Time course of intraocular hypertension produced by suxamethonium. *Brit. J. Anaesth.*, 44, 191.
- ROBERTSON, G. S. AND GIBSON, R. F. (1968). Suxamethonium and intraocular pressure. *Anaesthesiology*, 23, 342.
- ROYAL COLLEGE OF PSYCHIATRISTS (1977). Memorandum on the use of ECT (Part I): effectiveness of ECT. *Brit. J. Psychiat.*, 131, 261.
- SHAH, V. D., MANSURI, A. M., HAKIM, I. R., MEHD, U. S., MEHTA, S. H. AND DAMANY, S. J. (1977). Cardiovascular and electrocardiographic changes after ECT. *Indian J. Psychiat.*, 19(4), 51.
- SLATER, E. AND ROTH, M. (1969). *Clinical Psychiatry*. 3rd edition, London: Bailliere Tindal and Cassell.