

INFLUENCES OF RESERPINE ON E.C.T.: PRELIMINARY OBSERVATIONS

By

R. S. FERGUSON, M.B., Ch.B., D.P.M.

St. Nicholas' Hospital, Gosforth, Newcastle-on-Tyne

THERE have been some indications in recent literature (Naidoo, 1956) that reserpine influences the kind of fit that patients have with E.C.T. The first time this came to our notice was a few months ago when we noticed that a patient who was receiving 9 mg. of reserpine daily took an unduly long time to resume breathing after her fit. However, she also had Parkinsonism, and we were using succinyl choline and intravenous anaesthetic, so we thought that perhaps this was a Parkinsonian idiosyncratic response to reserpine and succinyl choline (Ferguson, 1956). Since then, in chronic psychotics who have been having quite large doses of the drug over a long period, we have been struck by the apparent delay in resuming respiration after E.C.T. given "straight", i.e. without relaxants. There have been alarming reports of collapse, even death in one instance from America (Foster and Gayle, 1955).

The purpose of the present investigation was therefore to measure some aspects of the convulsion in a group of patients who were receiving both reserpine and E.C.T., and to compare similar results in patients who were receiving maintenance E.C.T. alone. No attempt will be made to evaluate therapeutic differences here.

METHOD

An Ectron machine was used and current was passed for 1.5 seconds in each case. Time intervals were measured from the initial depression of the switch until respiration was clearly re-established, i.e. the third spontaneous inspiration. This was carried out in 13 cases receiving only E.C.T. and in 7 cases who had reserpine-E.C.T.

In a subgroup consisting of 8 non-reserpine cases and 4 reserpine cases, blood pressure and pulse rates were measured 15 minutes before the fit and 15 minutes afterwards.

The number of clonic spasms following the tonic phase was counted in another subgroup. The cases were all female, age range 21-56, and duration of stay in hospital varied from 1-18 years. The reserpine group had been receiving the drug for 8 weeks in a dosage of from 3-8 mg. daily.

RESULTS

(a) *Period of Apnoea*—see Table I.

TABLE I
Apnoea

Type	No. of Cases	Total Apnoea Time (seconds)	Average (seconds)	Range (seconds)
E.C.T. alone	13	628	48.3	36-73
E.C.T. & reserpine	7	366	52.3	43-60

(b) *Clonic Spasms*—see Table II.

TABLE II
Clonic Spasms

Type	No. of Cases	Total	Average	Range
E.C.T. alone	8	475	59.4	37-90
E.C.T. & reserpine	7	80	11.4	0-21

(c) *Blood Pressure*—Mean arterial blood pressure was the measure used (M.A.B.P.=Diastolic pressure plus one third pulse pressure)—see Table III.

TABLE III
Blood Pressure

	Non-Reserpine		Response	Reserpine		Response
	Before	After		Before	After	
M.A.B.P. mm. Hg	93	100	Up	70	90	Up
	85	83	Down			
	97	102	Up	82	87	Up
	123	102	Down			
	109	87	Down	90	97	Up
	93	92	Down			
	97	86	Down	88	92	Up
	102	90	Down			

It will be seen, therefore, that there is a clear tendency for the blood pressure to rise in reserpine-E.C.T. cases.

(d) *Pulse Rate*—These results show an increase in pulse rate in both groups, though the response is more clear-cut in the reserpine group (see Table IV).

TABLE IV
Pulse Rate

	Non-Reserpine E.C.T.		Response	Reserpine E.C.T.		Response
	Before	After		Before	After	
Pulse Rates	90	100	Increase	64	74	Increase
	90	98	Increase			
	84	98	Increase	56	80	Increase
	104	94	Decrease			
	84	86	Increase	60	72	Increase
	88	84	Decrease			
	112	116	Increase	64	76	Increase
	110	120	Increase			

DISCUSSION

Although the numbers involved are far too small for any reliable appraisal, it does seem likely that such differences as have been noted in the number of clonic spasms are going to be greater than can be accountable by chance. In

fact, on the first two occasions when E.C.T. was given, we assumed (erroneously, it now appears) that the responses were subconvulsive, and administered another shock. In the non-reserpine convulsion, the tonic stage passes into a stage of very fine tremor, and it is only when the tremor becomes coarse enough that the individual clonic spasms can be counted. Reserpine appears to abolish this stage of very fine tremor. The tonic phase occurs at once and quite violently, appears to last the usual length of time, and then abruptly ceases, to be followed by a few almost leisurely clonic spasms. In the 8 instances reported here, we counted 0, 19, 12, 6, 21, 3, 19 jerks. In the control group of 13 cases, the spasms ranged from 37–90. The effect of reserpine on neuromuscular tonus is well known, and coarse tremors are one of the commonest of its side effects (Vakil, 1949), going on to something approaching frank Parkinsonism in severe cases (Davies and Shepherd, 1955). There would be no point in speculating on the mechanisms involved in this short paper beyond perhaps saying that the explanation is likely to lie in the physiological action of reserpine on hypothalamic-extra pyramidal circuits.

As far as prolonged apnoea is concerned, this may be more apparent than real. We were surprised that the figure showed only a slight prolongation of the apnoeic interval in reserpine patients, for it appeared to be much longer when one was actually watching it. A possible explanation is this—that the fit itself was short lived in terms of muscular activity, but the apnoeic period lasted as long as or rather, on the average, longer than it does in ordinary cases. This discrepancy led to an intuitive but, as it turns out, faulty estimation. However, much larger numbers will need to be assessed before definite conclusions can be drawn. It may be, however, that there is a stage of reserpine treatment when it is unwise to use E.C.T. For example, the 6 cases of collapse, including the one fatality, quoted by Foster and Gayle (1956) had all been receiving the drug for only a few days. Now it is well known that, employing the dosage of 5–10 mg. per day which is now common psychiatric usage, the first week of the new regime finds the patient in a state akin to stupor, with vital functions considerably depressed. In addition, it has been our experience that the main disturbance in fluid balance occurs between the 10th and 20th day of treatment, whereupon it tends to remit rapidly and spontaneously. Foster and Gayle recommend that a week should elapse between stopping reserpine treatment and starting E.C.T. It is our impression that it may be equally safe to give E.C.T. to a patient who has been receiving reserpine for at least a month, i.e. when the physiological mechanisms have reached a plateau of adjustment.

Another feature noted in passing, the significance of which is not clear, is the wide opening of the eyes accompanied by upward rotation of the eyeballs which occurred from 25–30 seconds after the onset of the convulsion in the drug cases. This response was only seen in a small proportion of the cases treated by E.C.T. alone, those in which the fit was violent and prolonged. Additionally noted with the reserpine is the extent to which oral and pulmonary secretions are increased. This has not so far proved troublesome, and is only to be expected since hypersalivation and drooling are well known side effects of the drug.

SUMMARY

A short series of cases is reported comparing the effect of E.C.T. in patients receiving reserpine treatment with a control group.

The effects of the drug are as follows:

- (1) The post-ictal apnoeic interval is prolonged.
- (2) The muscular discharge is reduced and qualitatively altered.

Results of blood pressure and pulse rate changes in the two groups are given, but the numbers are too small for any useful conclusions to be drawn.

Certain precautionary measures concerning combined reserpine-E.C.T. treatment are discussed.

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