

COMPARATIVE STUDY OF TETRAETHYL AMMONIUM
BROMIDE AND HEXAMETHONIUM TESTS
IN
TOXAEMIAS OF LATE PREGNANCY

BY

SUKUMAR MITRA, M.B., B.S. (Pat.);

P. A. S. SAHAY, B.Sc., M.B., B.S. (Pat.);

S. N. UPADHYAY, B.S., M.D. (Pat.), M.R.C.O.G. (Lond.);

Department of Obstetrics & Gynaecology,

and

G. ACHARI, M.B., B.S. (Pat.), Ph.D. (Leeds),

Department of Pharmacology, P.W. Medical College, Patna.

Recently, the activity of autonomic nervous system, during normal pregnancy and in toxæmias of late pregnancy, has been the subject of investigation. At an earlier stage we observed that few patients recorded a lower blood pressure during the period of treatment with hexamethonium bromide than during a preliminary test with tetraethyl ammonium bromide. This led us to think that tetraethyl bromide might not be the suitable drug for assessment of the role of autonomic system in toxæmias of pregnancy. Earlier Smirk and Alstad had used hexamethonium bromide as a test drug in investigation of hypertension. A modified technique was adopted to utilise hexamethonium bromide as a test drug in investigation of hypertension in toxæmias of late pregnancy and comparative study of its effect with that obtained with tetraethyl ammonium bromide was made.

Case Materials.

Six patients were subjected to tetraethyl ammonium bromide and hexamethonium bromide test on consecutive days.

Tests were carried out after the patients were given a preliminary rest in bed for half an hour. Thus the possibility of postural hypotension, which may vary from individual to individual, was eliminated. Same instruments were used and the blood pressure was checked by one of us (S. M.) in each instance to avoid individual errors. Tetraethyl ammonium bromide was administered intravenously in 2 c.c. doses, hexamethonium bromide intravenously in 25 mg. doses except in Case I where 12.5 mg. were given. The dose of T.E.A.B. was adjusted as a result of personal observation and after the recommendation of Mukerjee and Govan.

TABLE I

		T.E.A.B. test	Hexamethonium test.	Remarks
Case	I	Fall of B.P. by 28/8 mm./Hg.	Fall of B. P. by 20/16 mm./Hg.	Classified in Group IV instead of in Group III.
Case	II	Rise of B. P. by 14/16 mm./Hg. Fall of B. P. by 6/0 mm./Hg. (Initially hypertensive).	Rise of B. P. by 44/24 mm./Hg. Fall of B. P. by 2/0 mm./Hg. (Initially hypertensive).	Classification Group II confirmed.
Case	III	Rise of B. P. by 16/30 mm./Hg. (Hypertensive)	Fall of B. P. by 50/34 mm./Hg.	Classification in Group IV instead of in Group I.
Case	IV	Fall of B. P. by 10/2 mm./Hg.	Fall of B. P. by 28/20 mm./Hg.	Classified in Group IV instead of in Group III.
Case	V	Fall of B. P. by 46/4 mm./Hg.	Fall of B. P. by 46/4 mm./Hg.	Classification Group III confirmed.
Case	VI	Fall of B. P. by 14/8 mm./Hg.	Fall of B. P. by 46/48 mm./Hg.	Classified in Group IV instead of in Group III.

The grouping of cases has been arbitrarily done according to following plan (Table II). Its significance has been mentioned elsewhere.

TABLE II

Group I	Hypertensive response
Group II	Hypotensive response— Doubtful S 0—9 — :: — mm. Hg. D 0—9
Group III	Hypotensive response— Positive systolic S 10 or more — :: — mm. Hg. D 0—9

Group IV

Hypotensive response—
Positive systolic
and diastolic
S 10 or more
— :: — mm. Hg.
D 10 or more

Results

Table I shows in comprehensive manner the response of blood pressure to different drugs used in test doses.

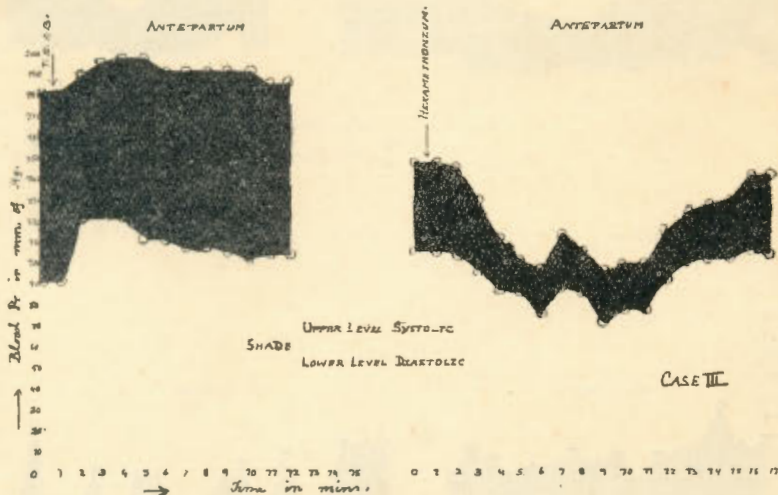
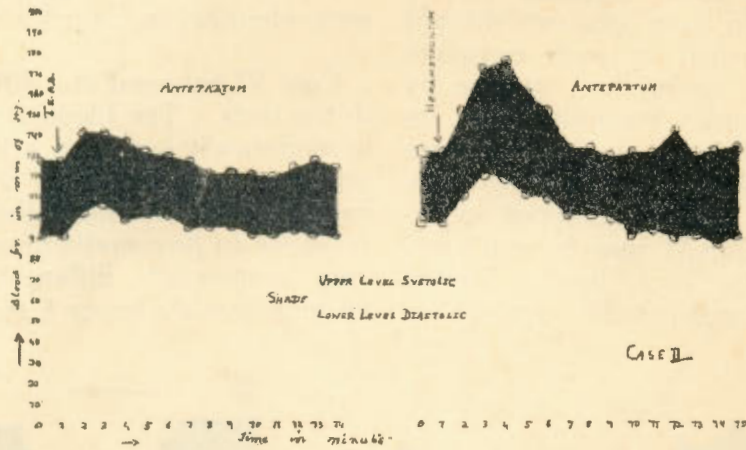
Interpretation of Results.

The results of each case may be considered separately.

Case I showed a fall of blood pressure after T.E.A.B. injection 28/8

mm. Hg. She was the first case of this group and we used 12.5 mg. hexamethonium bromide intravenously. The diastolic fall was significantly increased.

naline secretion as with T.E.A.B. Assuming that the drug lacks this property it can be deduced that hexamethonium in this case blocked the compensatory reflexes more com-



Case II showed initial hypertensive response with both T.E.A.B. and hexamethonium, the rise being S/D 14/16 mm. Hg. and 44/24 mm. Hg. respectively.

We have not as yet come across any report relating to the effect of hexamethonium in stimulating adre-

pletely than T.E.A.B. The protective role that the autonomic system at times plays in keeping the blood pressure lowered by compensatory vasodilatation thus becomes evident.

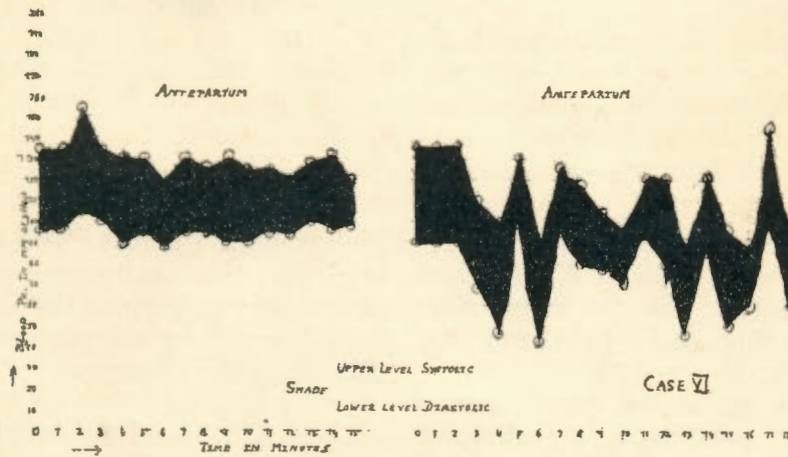
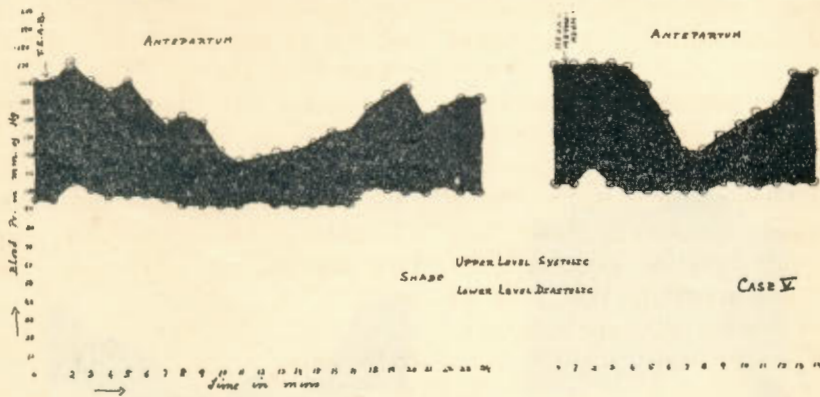
Case III showed marked hypertensive response to T.E.A.B. and mark-

ed hypotensive response to hexamethonium bromide. The hypertensive response to T.E.A.B. could be explained in terms of paralysis of compensatory reflexes. In that case the hypertensive response in this patient should have been evident and more aggravated by more complete blockade of autonomic ganglia by hexamethonium bromide (as in Case II). But the hexamethonium test recorded a contradictory response. We are thus inclined to believe that T.E.A.B. may have a pressure activity in at least a limited number of cases possibly through its

direct action on adrenal medulla in these cases is a further conjecture.

Case IV behaved similarly to case I. The blood pressure responses to T.E.A.B. and hexamethonium tests were identical in Case V.

Case VI behaved in a different way to the tests. The blood pressure fell to moderately low level with T.E.A.B. injection and gradually crept up to basal level at the end of the test. The response to hexamethonium bromide was somewhat different. It fell to considerably lower level and sub-



sequently recorded an alternate rise and fall. The fluctuations were of considerable degree. It appeared that hexamethonium seriously disturbed the blood pressure regulating mechanism and repeated spasmodic and abortive attempts were made to restore the pressure by some humoral factor.

Conclusion.

With hexamethonium test it is possible to study more correctly the behaviour of blood pressure after a complete blockade of compensatory autonomic reflexes and to segregate cases where primary etiological causative factor is of neurogenic or humoral origin.

Tetraethyl ammonium bromide is an unsatisfactory drug in investigation of the nature of hypertension because of its variable results. It is suggested that hexamethonium test should be adopted in obstetric research for ascertaining the role of autonomic nervous system in toxæmias of late pregnancy.

Summary.

1. Six patients of toxæmias of late pregnancy were subjected to T.E.A.B. and hexamethonium tests. Evidences suggest that (a) T.E.A.B. is a weaker autonomic ganglion blocking agent than hexamethonium bromide,

(b) effect of T.E.A.B. in majority of cases is a resultant of at least two actions—the autonomic ganglion blocking property and the other a humoral pressure effect.

2. Hexamethonium test should be adopted in preference to T.E.A.B. test in obstetric research.

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