

# SERUM URIC ACID LEVELS AND TRANSAMINASE ACTIVITIES IN TOXAEMIAS OF PREGNANCY

by

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Elevation of uric acid levels in blood in toxæmias of pregnancy was observed by Stander and Cadden as early as 1934. Since then several investigators have taken up this subject from time to time to assess the usefulness of serum uric acid estimations in diagnosis and therapy (Mcfarlane, 1963, Chowdhury & Chakravarti 1964).

The elevation of serum transaminases in late toxæmias of pregnancy has been reported by several workers (Crisp *et al.* 1959, Neumann and Kynak, 1961, Szinnayi *et al.* 1962, Dass and Bhagwanani, 1964, Santhanagopalan and Mukherjee, 1965). The purpose of the present report is to find out whether any correlation could be found between the levels of uric acid and transaminase activities in serum in late toxæmias of pregnancy and the usefulness of concurrent studies in those states.

## *Methods and Material*

The serum uric acid estimation was done according to the method of Brown (1945). The serum transaminases, serum glutamic oxalacetic (SGOT) and serum glutamic pyruvic transaminase (SGPT) activities were measured according to the method of Reitman and Frankel (1957). Blood was obtained by veni-puncture with no regard to fasting state. The blood was allowed to clot and retract and the separated serum was stored at 4°C. The estimations were done concurrently within 24 hours after collection of blood. Hemolysed serum was discarded and repeat samples obtained.

Sixty patients with late toxæmias of pregnancy constituted the subjects for study. The toxæmic patients were considered as mild pre-eclamptic, severe pre-eclamptic and eclamptic, depending upon their clinical features. Out of a total of 60 patients 22 had mild pre-eclampsia, 20 severe pre-eclampsia and 18 eclampsia. The subjects were considered to be mildly pre-eclamptic, if there was elevation of blood pressure (systolic rise be-

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TABLE I

		Pre-eclampsia				Eclampsia					
		Mild		Severe							
S. No.	SGOT	SGPT	Uric acid	S. No.	SGOT	SGPT	Uric acid	S. No.	SGOT	SGPT	Uric acid
1	45	25	3.6	1	80	15	5.6	1	55	10	6.0
2	30	5	3.8	2	55	15	4.0	2	150	20	4.8
3	50	10	3.2	3	88	15	6.4	3	58	10	5.6
4	45	22	2.7	4	50	15	6.8	4	65	20	6.6
5	45	15	5.2	5	125	61	6.8	5	160	40	10.2
6	30	5	5.2	6	40	60	6.2	6	56	12	5.0
7	35	15	4.6	7	185	95	6.8	7	60	8	5.6
8	25	15	4.1	8	50	30	4.8	8	89	30	5.8
9	50	25	5.0	9	55	26	6.0	9	45	35	6.0
10	35	10	5.7	10	63	61	8.0	10	195	45	6.4
11	20	15	5.1	11	85	45	8.0	11	71	70	6.4
12	71	28	5.5	12	45	15	4.0	12	85	35	5.1
13	63	30	6.6	13	63	61	6.3	13	160	65	10.5
14	55	22	3.0	14	125	85	4.8	14	125	48	6.2
15	35	22	4.7	15	63	70	5.4	15	130	40	6.3
16	55	20	5.6	16	30	30	4.0	16	95	15	3.3
17	39	51	4.0	17	45	15	2.3	17	116	28	4.8
18	27	58	3.4	18	22	30	6.6	18	62	28	4.4
19	15	28	3.1	19	63	70	5.4				
20	95	45	3.3	20	55	61	5.2				
21	55	40	5.2								
22	63	15	7.2								

SGOT and SGPT values—expressed as Units per ml.

Uric acid values expressed as mgms. per cent.

tween 30 to 50 mm. Hg. diastolic rise 20 to 30 mm. Hg.) and/or oedema and/or proteinuria were present. The patients were grouped as severe pre-eclampsia when the increase in systolic pressure was greater than 50 mm. Hg. and diastolic rise greater than 30 mm. Hg. in presence of either oedema or proteinuria or both of significant degree.

### Results and Discussion

The results of concurrent studies of uric acid and transaminases are shown in Tables I and II. The con-

over 43 units for SGPT was considered as abnormal.

In mild pre-eclampsia cases, uric acid was elevated in 41% of cases. SGOT was raised in 32% of cases while SGPT elevation was only in 14% of cases.

In severe pre-eclamptic patients, uric acid was elevated in 70% of cases, SGOT elevation was in 65% of cases while SGPT was elevated in 50% of cases.

In eclamptic subjects, uric acid was raised in 72% of cases, SGOT was raised in 94% of subjects while

TABLE II

	Range	Mean	Standard deviation
Normal pregnancy: (25 cases)			
Uric acid (mg.%)	2.2 - 5.0	3.2	0.8
SGOT (units/ml.)	6 - 42	18	12
SGPT (units/ml.)	5 - 30	13	10
Mild pre-eclampsia (22 cases)			
Uric acid (mg.%)	2.7 - 7.2	4.5	1.2
SGOT (units/ml.)	15 - 95	45	18
SGPT (units/ml.)	5 - 58	24	14
Severe pre-eclampsia (20 cases)			
Uric acid (mg.%)	2.3 - 8.0	5.7	1.4
SGOT (units/ml.)	22 - 185	70	37
SGPT (units/ml.)	15 - 85	44	26
Eclampsia: (18 cases)			
Uric acid (mg.%)	3.3 - 10.5	6.0	1.7
SGOT (units/ml.)	45 - 195	99	44
SGPT (units/ml.)	8 - 70	31	18

trol values for 25 pregnant women of third trimester (clinically normal) are as follows:—

3.2 ± 0.8 mg.% for uric acid.

18 ± 12 units for SGOT and 13 ± 10 units for SGPT.

Any value, over 5.0 mg.% for uric acid, over 50 units for SGOT and

SGPT was elevated in 22%.

Although the extent of rise of uric acid was not directly proportional to the rise of transaminases in all cases studied, the SGOT elevation ran parallel with that of uric acid in 23% of cases of mild pre-eclampsia, in 55% of cases of severe pre-eclampsia

and in 72% of cases of eclampsia patients.

Prabhavathi (1957) found uric acid very much raised in severe pre-eclamptic toxæmia. The results of Mcfarlane (loc. cit.) confirmed that "a raised level in pre-eclamptic toxæmia is probably diagnostic at levels over 4.5 mg. but the level is not necessarily raised in proportion to the clinical severity of the disease when applied to the individual. Nevertheless, levels of over 5.5 mg. invariably indicated that the disease was moderate or severe". Our findings are in agreement with those of Prabhavathi and Mcfarlane. Regarding the transaminases, in an earlier report (Santhanagopalan and Mukherjee loc. cit) the usefulness of individual transaminase estimations in toxæmias of pregnancy had been discussed. The elevation of transaminases is greater in severe pre-eclamptic toxæmia than in mild cases and this is perhaps due to the greater hepatic damage in the former (Dass and Bhagwanani, loc. cit).

In our studies the following conclusions are reached.

(1) The concurrent studies of uric acid and transaminases are more useful than single studies in diagnosis and prognosis of toxæmias of pregnancy.

(2) They are also useful to find out the severity of the disease.

(3) In eclamptic patients, both SGOT and uric acid are elevated much, due to the excessive muscular activity and hence are not comparable to pre-eclamptic states.

Although the elevation of transaminases and uric acid occurred in mild pre-eclampsia, they are not

directly proportional to the severity in mild pre-eclampsia. But in severe pre-eclampsia, in more than 50% of cases, the concurrent estimations revealed that SGOT and uric acid did rise with the severity of the disease. In eclamptic patients the concurrent determinations of uric acid and transaminases are highly useful in diagnosis and prognosis.

#### *Summary*

Sixty cases of late toxæmias of pregnancy were studied. The cases were grouped as mild and severe pre-eclampsia and eclampsia, depending upon the clinical features. Concurrent uric acid and transaminase (Glutamic Oxalacetic transaminase and Glutamic Pyruvic transaminase) estimations in serum were made in all cases.

Uric acid was elevated in 41% of cases in mild pre-eclampsia, in 70% of cases in severe pre-eclampsia and in 72% of cases of eclampsia, while SGOT was elevated in 32% of cases in mild pre-eclampsia, 65% in severe pre-eclampsia and in 94% of cases in eclampsia. SGPT was raised in 14% of cases in mild pre-eclampsia, 50% in severe pre-eclampsia and 22% in eclampsia. Concurrent determinations of uric acid levels and transaminase activities in serum appear to be more useful than single determinations in toxæmias of pregnancy.

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