

SERUM TRANSAMINASES IN TOXAEMIA OF PREGNANCY

by

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Introduction

It is well known fact that ischaemic necrosis of any organ is associated with increased serum transaminases activity which runs parallel to the extent and degree of infarction. Areas of infarction are not uncommon to be seen in placenta of toxæmic patients (Lewis 1964). Serum transaminases activity is increased in toxæmia of pregnancy and can be used as diagnostic as well as prognostic tool in toxæmia of pregnancy (Crisp *et al* 1959). The present study has been carried out to confirm the above facts.

Material and Methods

Present study includes 122 subjects divided into two major groups, the control group comprising of 15 non-pregnant and 15 normal pregnant women, while the second group is experimental one. In all above subjects beside obtaining complete history, detailed examination and routine investigations blood sampling for serum glutamic oxaloacetic acid (S.G.O.T.), Serum glutamic pyruvic acid (S.G.P.T.), liver function test, serum proteins, blood urea and blood uric acid was done irrespective of fasting state of patient. Second blood sampling

was done on 4th or 5th day of delivery, E.C.G. tracings were taken of all the patients at the time of admission.

Biochemical estimation of serum transaminases was done by Reitman and Frankel (1957) method as described by King Wooton (1964). After delivery the placenta was examined for the evidence and extent of infarction. Datas were compiled and to prove their significance ANOVA test and 't' test were applied ($p < 5\%$).

Observations

Serum glutamic oxaloacetic and serum glutamic pyruvic acid levels were increased in moderate and severe P.E.T. and in eclamptic cases and the difference was found to be significant when compared to control group and benign hypertensive cases. Serum transaminases showed demonstrably significant fall after delivery.

Parity as well as age has no influence on levels of serum transaminases.

No rise in serum transaminases levels in cases of essential hypertension complicating pregnancy. Rise in serum glutamic oxaloacetic acid level is more than the rise in serum glutamic pyruvic acid level. Serum transaminases levels run parallel to the degree of placental infarction which in turn also goes parallel to the severity of toxæmia.

Liver function test, serum proteins and A/G ratio were within normal limits in

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TABLE I

Number of Patients with Liver Function Tests Positive

Group No.	Group of patient	No. of patients	Icterus Index above 4 units	Vaden Burgh positive	Thymol Turbidity above 4 units	Thymol Flocculation above 1+
1.	Non-pregnant	15	—	—	—	—
2.	Normal pregnant	15	—	—	—	—
3.	Mild P.E.T.	20	—	1	—	—
4.	Moderate P.E.T.	15	—	—	—	—
5.	Severe P.E.T.	17	—	—	1	—
6.	Eclampsia	30	2	1	2	—
7.	Benign hypertension with pregnancy	10	—	—	—	—

N.B.: Liver function tests show that there is no significant deterioration of liver during toxæmia of pregnancy.

TABLE II

Mean Values of Serum Total Proteins, Globulin and Albumin

Group No.	Group of Patient	Total proteins (gm.%)	Albumin (gm.%)	Globulin (gm.%)	A/G Ratio
1.	Non-pregnant	5.69	2.40	3.29	3:4
2.	Normal pregnant	5.53	2.27	3.26	2:3
3.	Mild P.E.T.	5.57	2.91	2.66	2:3
4.	Moderate P.E.T.	5.58	2.81	2.77	3:4
5.	Severe P.E.T.	5.17	2.65	2.52	2:3.5
6.	Eclampsia	5.24	2.59	2.65	
7.	Benign Hypertension with pregnancy	5.88	2.94	2.94	2:3.5 1:1
	Mean values	6.0-7.5	2.45-4.1	2.5-3.5	

N.B.: Mean values for serum proteins show no any significant variation among all the groups. A/G ratio is also not altered significantly.

TABLE III
Mean Values of Uric Acid, Blood Urea, S.G.O.T. and S.G.P.T.

Group No.	Group of patient	Blood uric acid	Blood urea	S.G.O.T.		S.G.P.T.	
				Before delivery	After delivery	Before delivery	After delivery
1.	Non Pregnant	1.07	12.65	5.78	—	4.68	—
2.	Normal Pregnant	1.95	13.56	9.67	3.27	6.04	2.65
3.	Mild P.E.T.	5.04	20.11	11.58	7.75	7.81	5.50
4.	Moderate P.E.T.	5.41	20.85	19.40	11.87	14.60	8.20
5.	Severe P.E.T.	7.55	34.23	23.94	11.53	20.76	9.00
6.	Eclampsia	7.96	42.04	45.94	20.41	43.37	15.06
7.	Benign Hypertension with pregnancy	3.85	32.59	8.90	7.20	5.50	4.20

TABLE IV
Patients Showing Infarction of Placenta

Group No.	Group of patient	Total No. of	No. of patients with area of infarction				No. of patient with infarcted placenta
			2 studied	4 cotyledon	6 cotyledon	8 or more cotyledon	
1.	Normal Pregnant	15	1	—	—	—	1 (6.6%)
2.	Mild P.E.T.	20	3	2	—	—	5 (25%)
3.	Moderate P.E.T.	15	2	2	1	—	5 (33.3%)
4.	Severe P.E.T.	17	2	2	2	1	7 (41.2%)
5.	Eclampsia	30	5	5	5	7	22 (73.2%)
6.	Essential Hypertension with pregnancy	10	—	—	—	—	—

N.B.: Incidence as well as extent of placental infarction increases and run parallel to the severity of toxæmia.

all the groups with no significant variance indicating that liver functions are not deranged in toxæmia of pregnancy.

Blood uric acid levels are elevated significantly in toxæmic patients but not so in cases of benign hypertension complicating pregnancy. This rise in uric acid is proportionate to the severity of toxæmia.

Blood urea also rises in toxæmia but this rise is only significant in severe P.E.T., Eclampsia and Benign Hypertension complicating pregnancy.

E.C.G. study showed no changes. All the cases had tracings within normal limits except two patients of essential hypertension who had L.H.V. and left axis deviation.

Review and Discussion

Ninety two cases of toxæmia studied for transaminases activity revealed that there is significant rise in serum transaminases (S.G.O.T. & S.G.P.T.) activity in moderate, severe P.E.T. and Eclampsia. When compared to 30 control cases. This is in agreement with Meranze *et al* (1937), Borglin (1959), Crisp (1959), Szinnayi (1963), Dass and Bhagwanni (1964), Santhangopalan (1965), John *et al* (1971), on the other hand Theisen (1961), Quint Spanos (1959), Nawal Kishore (1969) reported no significant rise.

Normal liver function tests observed in present study indicate no hepatic damage in toxæmia whereas Borglin (1959) and Szinnayi (1963) considered that hepatocellular damage may be the source of raised transaminases enzymes, but no clinical as well as histopathological observation could fortify their hypothesis.

Normal E.C.G. tracings in all the cases indicate normal functional status of the myocardium; excluding the heart to be

the source of elevated transaminases. Young was perhaps the first to draw attention to the association of placental infarct with toxæmia of pregnancy. Roy Chaudhary (1963) then suggested that placental infarction and placental damage as in accidental haemorrhage is the source of raised serum transaminases. In present series also there is significantly raised serum transaminases activity and area of placental infarction both being parallel to severity of toxæmia. Hence it would be correct to draw a conclusion that raised serum transaminases are of placental origin. This is further fortified by the observation made by John *et al* (1971).

Summary

1. Serum transaminases (S.G.O.T. & S.G.P.T.) are raised in moderate, severe P.E.T. and Eclampsia. There is no significant rise in essential hypertension complicating pregnancy.

2. Serum transaminases levels tend to settle down as patient's condition improves hence their repeated estimation can be used as prognostic tool.

3. Raised serum transaminases are of placental origin (infarcted area).

4. Blood uric acid is raised in toxæmia of pregnancy and runs parallel to the severity. It remains normal in essential hypertensive pregnant women who do have high blood urea.

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