OBSERVATIONS ON SERUM TRANSAMINASES IN TOXAEMIA OF PREGNANCY

by

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Toxaemias of pregnancy are characterised by hypertension, oedema and proteinuria, separately or together and may culminate in convulsions and coma. From postmortem examination of fatal cases of eclampsia and by needle biopsy of liver in cases of pre-eclampsia and eclampsia, it has been found that liver is one of the organs in which there is a definite pathological lesion in the form of focal, peripheral necrosis of liver cells. But, in spite of these lesions in the liver there is hardly any detectable alteration in its function by standard liver function tests.

When the importance of SGO-T and SGP-T as indices of hepatocellular injury was confirmed by La-Due (1954), some of the workers estimated values of SGO-T and SGP-T in cases of toxaemia of pregnancy. Work on the subject is still not sufficient to give definite conclusion.

The present work of estimation of SGO-T and SGP-T in cases of toxaemia of pregnancy was undertaken in order to assess the usefulness of serum transaminase value in detecting the prognosis and time of occurrence of liver injury in the course of toxaemia of pregnancy.

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Material and Method

The enzymes, serum glutamic oxaloacetic transaminase and serum glutamic pyruvic transaminase were estimated in 55 cases of acute toxaemia of pregnancy, 25 cases of healthy pregnant women and 25 cases of non-pregnant women. Among the 55 cases of acute toxaemia of pregnancy, 38 were cases of pre-eclampsia and 17 were cases of eclampsia.

Cases were collected from indoor and out patient department of women's hospital of Darbhanga Medical College Hospital and estimations of SGO-T and SGP-T were done in the department of Biochemistry of Darbhanga Medical College.

Estimations of SGO-T and SGP-T were done by the method of Reitman and Frankel (1957) with minor modifications. The results are expressed in Karmen units.

Results and Discussion

The results of present work are given in Table I and Table II. In cases of non-pregnant women values of SGO-T and SGP-T were 1 to 30 units and 3 to 20 units respectively.

TABLE I

SGO-T and SBP-T Levels in Non-pregnant, Normal Pregnancy and Toxaemia of Pregnancy

Group	SGO-T level Mean with S.D. Range in Karmen Units	SPG-T level Mean with S.D. Range in Karmen Units
Non-pregnant women (25 cases)	15 ± 7.2 (S.D.) Range 1 to 30 Units/ml.	11 ± 5.5 (S.D.) Range 3 to 20 Units/ml.
Pregnant women (25 cases)	13 ± 6.4 (S.D.) Range 3 to 27 Units/ml.	11 ± 6.5 (S.D.) Range 2 to 25 Units/ml.
Mild pre-eclampsia (25 cases)	25 ± 9.5 (S.D.) Range 5 to 42 Units/ml.	24 ± 9.4 (S.D.) Range 10 to 47 Units/ml.
Severe pre-eclampsia (13 cases)	60 ± 24.62 (S.D.) Range 21 to 95 Units/ml.	57 ± 20.60 (S.D.) Range 25 to 85 Units/ml.

TABLE II

Mean Values of SGO-T and SGP-T in 17 Cases of Eclampsia From 1st to 15th Days of Convulsions

	Days of convulsions				
	1st day	3rd day	6th day	10th day	15th day
SGO-T	77 Units per ml.	74.5 Units per ml.	76 Units per ml.	34 Units per ml.	30 Units per ml.
SGP-T	50 Units per ml.	62 Units per ml.	63.5 Units per ml.	35 Units per ml.	28 Units per ml.

In cases of normal healthy pregnant women the value for SGO-T was 3 to 27 units, whereas value for SGP-T was 2 to 25 units. There was no difference between the SGO-T and SGP-T values in non-pregnant and pregnant groups.

Knutson *et al* (1958), Stone *et al* (1960) and West and Zimmerman (1958) have found the values to be significantly lower in normal pregnancy. Dass and Bhagwani (1964) supported the finding of above workers in this respect and showed that the values of these enzymes were in lower range when compared with non-pregnant healthy women. But Santhangopalan and Mukherjee (1965) did not observe any difference between the two groups (Pregnant and non-pregnant) as in the present work.

Those who have shown lowered value of these enzymes in cases of normal pregnancy have suggested that value was low due to deficiency of Vit. B_6.

In mild toxaemia of pregnancy the SGO-T and SGP-T were raised in a few cases only. This rise was in agreement with previous workers (Dass and Bhagwani, 1964).

In severe toxaemia of pregnancy, SGO-T and SGP-T both were raised in most of the cases. The mean value obtained for SGO-T was 60 ± 24.62 units/ml. of serum and range of SGO-T was 21 to 95 units/ml of serum. For SGP-T range of value was 25 to 85 units with a mean value of 57 ± 20.60 units. It was found that SGO-T was raised in 9 out of 13 cases of severe pre-eclampsia, whereas SGP-T was raised in 12 cases out of 13 cases of severe pre-eclamptic toxaemia.

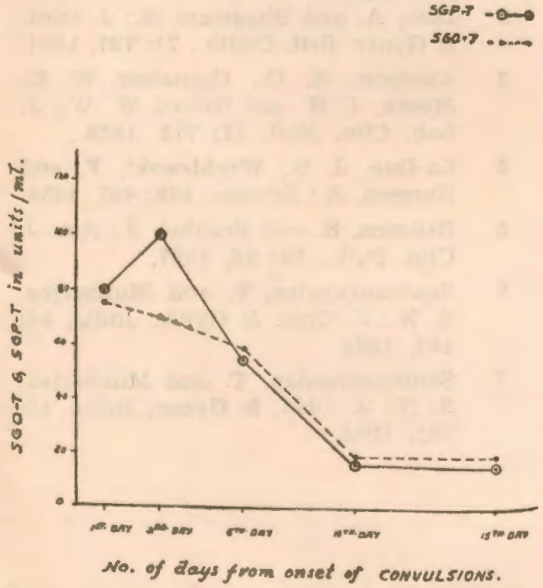
Dass and Bhagwani (1964) found SGO-T within normal limit in severe pre-eclampsia and rise in SGP-T was found in 6 out of 19 cases.

Table II shows the mean value of SGO-T and SGP-T in 17 cases of eclampsia from 1st to 15th day of convulsion. There was rise in these enzymes in cases of eclampsia. For SGO-T maximum mean value was obtained on the 1st day of convulsions, whereas the SGP-T was raised to its maximum on the 6th day of convulsion.

Figure I shows the value of SGO-T and SGP-T on different days in a single case of eclampsia who recovered. It will be seen that SGP-T has highest value on 3rd day of convulsion, whereas SGO-T was highest in the very first sample taken on the first day, 6 hours after convulsions.

Fig. 1.

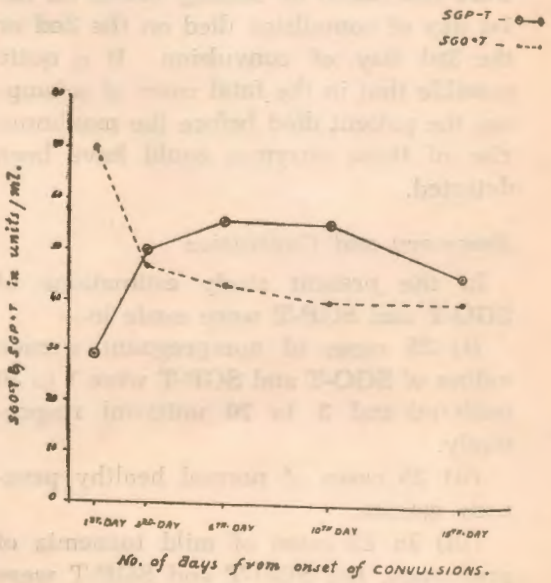
Graph showing SGO-T & SGP-T in a Case of ECLAMPSIA. (CASE NO – 7.)



Similarly, Fig. II shows the pattern of rise in SGO-T in another case of eclampsia who also recovered. Maximum value of SGO-T was obtained in the very first sample of blood taken only a few hours after convulsions, whereas maximum value for SGP-T was obtained on the 6th day of convulsion.

Fig. 2.

Graph showing values of SGO-T & SGP-T in a Case of ECLAMPSIA. (CASE NO 9.)



Therefore, in eclampsia, one of the enzymes SGP-T has been found to be rising when the other enzymes SGO-T is falling. It shows that these two enzymes may not be released at the same time, during injury of the liver cells. It is just possible that SGO-T and SGP-T are not situated at one place within the liver cells, and injury might have disturbed one enzyme first followed by other.

Elevated levels have been reported by Crisp *et al* (1959), Dass and Bhagwani (1964), Santhangopalan and Mukherjee (1964). In present work maximum rise in SGO-T and SGP-T was 405 units/ml and 220 units/ml in a case of eclampsia. Both the enzymes returned to normal

limit on the 10th day of convulsions and the patient survived.

It was found that a raised value did not necessarily indicate bad prognosis in cases of eclampsia. Severe cases of eclampsia in whom very high value of SGO-T and SGP-T were obtained from the very beginning survived, whereas the patients in whom SGO-T and SGP-T were not raised or slightly raised on the 1st day of convulsion died on the 2nd or the 3rd day of convulsion. It is quite possible that in the fatal cases of eclampsia, the patient died before the maximum rise of these enzymes could have been detected.

Summary and Conclusion

In the present study estimations of SGO-T and SGP-T were made in—

(i) 25 cases of non-pregnant women values of SGO-T and SGP-T were 1 to 30 units/ml and 3 to 20 units/ml respectively.

(ii) 25 cases of normal healthy pregnant women.

(iii) In 25 cases of mild toxaemia of pregnancy, the SGO-T and SGP-T were raised in few cases only.

In severe toxaemia of pregnancy, SGO-T and SGP-T both were raised in most of the cases.

In cases of eclampsia five samples of blood were taken from the patients who survived in order to find the peak value of these enzymes during the course of illness.

In cases of eclampsia, maximum rise in SGO-T was obtained on the very first day of convulsion, whereas maximum rise for SGP-T was obtained on the 6th day of the convulsion.

In majority of cases of toxaemia rise of these enzymes was proportional to the severity of the symptoms (blood pressure, oedema and albuminuria).

The maximum values obtained in the present study were 405 units/ml for SGO-T and 220 units/ml for SGP-T in a case of eclampsia who survived and serum level of these enzymes returned to normal within 15 days of convulsion. As far as immediate prognosis of toxaemic women are concerned it was not dependent on the level of these enzyme in the serum.

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