

THE VALUE OF HEAT-STABLE ALKALINE PHOSPHATASE IN ABORTION

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Serum heat stable alkaline phosphatase enzyme is of placental origin as shown by Neale *et al* (1964). Its stability at 65°C was proved by Hunter (1969).

Increase in serum HSAP activity in pregnancy has been observed by various workers, Curzon and Morris (1968), Hunter (1969), Pirani *et al* (1972), Sunandabai *et al* (1974), Kapoor and Mehta (1974). Hunter (1969) in his study observed serum HSAP activity as a sensitive indicator of placental function, and fetal growth. Changes in activity of this enzyme are manifested ahead of clinical symptoms and signs in cases of disturbed pregnancy. Such a test therefore can be a valuable asset in cases of abortion from point of view of prognosis and management. With this view the present study was carried out in cases of abortion.

Material and Method

A total of 180 patients with vaginal bleeding in early pregnancy (8 weeks on-

wards) have been studied. A total of 580 estimations were done. Serial estimations (3 or more reading) were done in 103 cases.

Among 180 cases, there were 128 cases of threatened abortion, 38 cases of incomplete abortion and 14 cases of missed abortion. Serial estimation was possible in 85 cases of threatened abortion, 12 cases of incomplete abortion and 6 cases of missed abortion.

In present study, the estimation of alkaline phosphatases was done by universally accepted technique of King Armstrong (1934) later modified by King (1951). The heat-stable alkaline phosphatase was assayed after incubation of the serum at 65°C for 30 minutes.

Results and Discussion

Normal range was established by cumulative data from normal pregnancy of serum HSAP values; it showed a broad range of activity (Figs. 1 & 2), but a pattern of progressive rise with advancement of pregnancy. Similar pattern of activity was observed by Hunter *et al* (1970), Sunandabai *et al* (1974) and Kapoor and Mehta (1974).

The end result of pregnancy in relation to initial value is shown in Table 1. It was observed that in cases of missed and incomplete abortion, higher number of low

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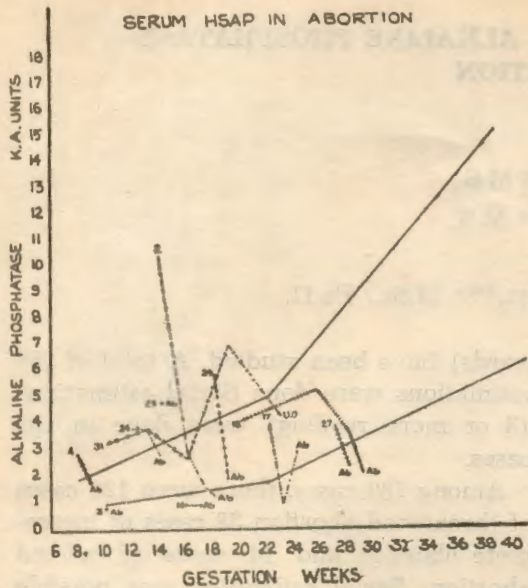


Fig. 1

Graph showing serum-HSAP curve in some of the cases who aborted.

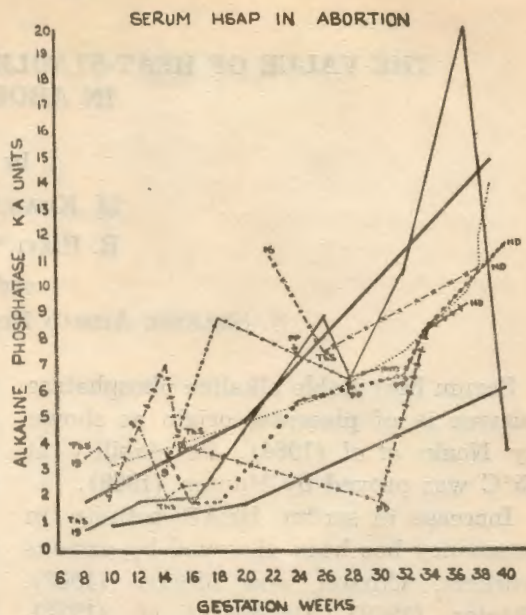


Fig. 2

Graph showing serum-HSAP curves in some of the cases who continued the pregnancy—the occurrence of events and end results are marked.

TABLE I

Pregnancy Outcome in Cases of Abortion in Relation to Serum-HSAP Level

HSAP value	Total No. of cases	No. of cases aborted	No. of cases cont. pregnancy	% of cases cont. pregnancy
Low	40	36	4	10%
Normal	27	15	12	44%
High	103	35	68	66%
N.R.	10	—	—	—

values were recorded. Only 10% of patients with low values were able to continue their pregnancy, while in group of normal and high values 44% and 66% respectively continued their pregnancies.

In cases with serial estimation the outcome of pregnancy in relation to serum HSAP activity was studied under two broad groups:

Gr. I: Included 37 cases which aborted—

Threatened abortion 19
 Incomplete abortion 12
 Missed abortion 6

Gr. II: Included 66 cases of threatened abortion which continued beyond 28 weeks.

Group I:

In this group serum HSAP values were persistently low or showed a falling curve irrespective of initial value (Fig. 1).

Therefore, such pattern of activity associated with cessation of uterine growth is confirmatory of the diagnosis of fetal death in early pregnancy.

Group II: (Table II, Fig. 2)

TABLE II

Pregnancy Outcome in Cases Going to Term in Relation to Serum-HSAP Curve

Type of HSAP-curve		Normal curve	Ab-normal curve
No. of cases		30	36
Labour Outcome	N.D.	30	24*
	P.N.D.	—	6
	P. Pains and other complications	—	30*

* Head normal delivery.

In this group the cessation of bleeding was associated with return of serum HSAP activity to normal either from low or high value. A progressive rise with advancement of pregnancy (normal curve) was observed in 30 cases, and prognosis was excellent, while in 36 cases complications in the form of recurrence of bleeding, premature pains, premature delivery or toxæmia were observed corresponding to fluctuation in maternal serum HSAP (abnormal Curve). The change from normal trend was observed 2-4 weeks ahead of clinical sign and symptom.

Hunter (1969) reported serum HSAP

result in 500 pregnant women. In normal patient he found linear rise in serum value with advancement of pregnancy, the scatter of values being less than that demonstrated for urinary oestradiol. Fluctuations were observed in cases associated with complications.

Summary

Serum-HSAP activity was studied in 180 cases of abortion. The initial values of serum-HSAP was of not much help in predicting the outcome in comparison to serial estimation. In group where the value settled to normal and showed a progressive curve prognosis was excellent. While curve showing fluctuation was associated with complication. In contrast to this if the values were persistently low or falling, abortion occurred.

References

1. Curzon, P. and Morris, I.: *J. Obst. & Gynec. Brit. Cwlth* 75: 151, 1968.
2. Hunter, R. J.: *J. Obst. & Gynec. Brit. Cwlth* 76: 1057, 1969.
3. Hunter, R. J., Pinkerton, J. H. N. and Johnston, F.: *Obst. & Gynec.* 36: 536, 1970.
4. Kapoor, U. and Mehta, H. C.: *J. Obst. & Gynec. of India* 24: 167, 1974.
5. King, E. J.: *Microanalysis in medical Biochemistry*, Ed. 2, London 1951. pp. 70.
6. Neale, F. C., Clubb, J. S. and Posen, S.: Quoted by Reference 3.
7. Pirani, B. B. K., MacGillinary, I. and Duncan, R. O.: *J. Obst. & Gynec. Brit. Cwlth* 79: 127, 1972.
8. Sunanda Bai, K., Rohatgi, P., Agnihotri, M. and Lahiri, B.: *J. Obst. & Gynec. India*, 24: 41, 1974.
9. Wallace, S. J. and Michie, E. A.: *Lancet*, 2: 560, 1966.