BLOOD COAGULATION STUDIES IN MID-TRIMESTER TERMINATION OF PREGNANCY

by

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Introduction

Consumptive coagulopathy is a known complication after intra-amniotic injection of hypertonic saline. Sometimes this complication has a fatal outcome. Stander (1971) and Talbert *et al* (1973) studied coagulation factors and showed a decrease in platelets, fibrinogen, Factors V and VIII after "Salting". They concluded that the decrease in consumable clotting factors resulted from disseminated intravascular coagulation (DIC). Other workers Weiss *et al* (1972), Bellar *et al* (1972) also studied similar factors and confirmed the same results after intra-amniotic hypertonic saline. This complication prompted Bellar *et al* (1973) to study coagulation factors in patients whose pregnancy was terminated by catheter technique. They found that there was no change in any of the parameters.

Our aim of study is to study coagulation factors in extra-ovular Ethacredine lactate, acriflavin and Normal saline and compare with intra-amniotic hypertonic saline.

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Material and Methods

One hundred and eighteen cases were studied at J.J. Hospital, Bombay, during the period from 1st April 1977 to 31st August 1977. All these patients came for termination of pregnancy between 12 to 20 weeks (Table I). Various mehods like extraovular or intra-amniotic were used for termination of pregnancy. The drugs which we used are Ethacredil Lactate. 0.1% (E.L.) Acriflavin 0.1% (A.F.) Normal saline (N.S.) and intra-amniotic hypertonic saline 20% (H.S.).

Serially four samples of blood were collected—the first before the procedure, second 6 hours later, third 24 hours later and fourth 48 hours later. The blood samples were collected in oxalate citrate.

Estimation of fibrinogen was done by Goodwin's method. Prothrombin time studied by Quick's method by using brain power; Euglobulin Lysis time student by Milestone's method and platelet count by direct visualization under phase contrast microscope.

Observation

Total of 118 cases were studied. They

were of different age, parity and period of gestation as shown in Table I.

TABLE I
Age Parity Period of Gestation

Parameters	Group	No. of patients	Percentage
I. Age	14-20 yrs.	34	28.8
	21-25 yrs.	37	31.35
	26-30 yrs.	33	20.33
	31 & above	14	11.01
II. Parity	Unmarried	43	36.44
	Para I & II	39	33.05
	Para III & IV	27	22.57
	Para V & above	9	7.62
III. Period of Gestation	12-14 weeks	7	5.93
	14-16 weeks	47	39.40
	16-18 weeks	30	25.46
	18-20 weeks	34	28.8

Out of 118 cases, 35 were treated with E.L., out of which in 23 cases unitocin was used and in 12 cases no unitocin was used. Thirty-six cases were treated with A.F. Of these 20 cases with unitocin and 16 without unitocin. Fourteen cases were instilled with normal saline and unitocin and remaining 33 cases with intra-amniotic hypertonic saline.

Average induction abortion interval was minimum with hypertonic saline (Table II). No other complications like haemorrhage, infection or cervical tear were seen in this series.

Table III, shows that there was increase in the mean fibrinogen level in patients

TABLE II
Average Induction Abortion Interval in Hours

Drug Used	Average Inj.—Abortion Interval in Hrs.	
E.L. + Unitocin	43 hrs.	43 mins.
E.L.	55 hrs.	43 mins.
A.F. + Unitocin	63 hrs.	57 mins.
A.F.	64 hrs.	15 mins.
N.S.	65 hrs.	20 mins.
H.S.	34 hrs.	29 mins.

TABLE III
Average Fibrinogen Level in mgm/ml

Drug Used	Before Installation	6 Hrs. Later	12 Hrs. Later	24 Hrs. Later
E.L.	309.42	314.82	346.20	369.83
A.F.	309.42	316.58	348.39	376.83
N.S.	309.42	300.93	331.00	349.57
H.S.	309.42	297.38	331.70	373.60

treated with E.L. and A.F. In cases with N.S. and H.S. there was fall of mean fibrinogen level from 309.42 mgm/ml to 300.93 mgm and 297.38 mgm respectively. The maximum rise of fibrinogen level was seen in the 4th sample of patients treated with A.F. The increase in fibrinogen level after the end of 48 hours was about 20% in E.L. group, 22% in A.F. group, 12% in N.S. group. H.S. group showed a fall of fibrinogen level by 4% after 6 hours but an increase of 21% at the end of 48 hours.

The platelet count showed hardly any significant change. In EL group there was a rise in mean platelet count from 198,827 to 206,400/cu, while in NS the rise was from 198,827 to 208,710 and HS group from 198,827 to 201,650/cu (Table IV).

Euglobulin Lysis Time

In all cases of EL, AF, NS the euglobulin lysis time was more than 120 seconds in all 4 samples. In H.S. group also the Euglobulin lysis time was more than 120 seconds in all four samples except in 4 cases. In these 4 cases of HS the second sample showed an Euglobulin lysis time of 90, 50 and 90 seconds respectively.

Discussion

Stander *et al* (1971) and Wiess *et al* (1972) studied coagulation factors after intraamniotic hypertonic saline in second trimester termination of pregnancies. They observed significant fall in fibrinogen, platelet and Factors V and VII. They concluded that decrease in consumable clotting factor probably resulted from disseminated intravascular coagulation (DIC). However, the mechanism which triggers intravascular coagulation after salt injection is unknown. One possibility is the development of "Leaks" in the chorioamnion following administration of hypertonic saline or intravenous infusion of amniotic fluid or some other thromboplastin material from thromboplastic activity.

TABLE IV

Average Platelet Count Per cum

Drug Used	1st Sample	2nd Sample	3rd Sample	4th Sample
E.L.	192,827/cum	204,794	214,471	206,400
A.F.	198,827/cum	201,080	195,140	205,560
N.S.	198,827/cum	203,000	204,850	208,710
H.S.	198,827/cum	198,940	194,480	201,650

In E.L. group the mean prothrombin time showed a fall from 25.42 seconds to 23.87 seconds 6 hours but later a rise to 29.33 seconds. In A.F. group mean prothrombin time was prolonged from 25.42 seconds to 31.56 seconds at the end of 48 hours. In N. S. group it was prolonged to 28.94 seconds, whereas in H.S. group it was prolonged from 25.42 seconds to 44.94 seconds (Table V).

TABLE V

Average Prothrombin Time in Secs.

Drug Used	Before	Hrs. Later	24 Hrs. Later	48 Hrs. Later
E.L.	25.42 sec.	23.87 sec.	26.06 sec.	29.33 sec.
A.F.	25.42 sec.	41.36 sec.	41.44 sec.	31.35 sec.
N.S.	25.42 sec.	25.93 sec.	32.15 sec.	28.96 sec.
H.S.	25.42 sec.	45.16 sec.	46.65 sec.	44.94 sec.

In our series in 33 cases of intra-amniotic hypertonic saline, there was slight fall in fibrinogen level after 6 hours, but after 24 hours there was increase in fibrinogen level and after abortion or at the end of 48 hours the fibrinogen level was more than normal. The platelet counts showed no significant change in our series.

Weiss *et al*, (1972). reported no significant change in prothrombin time, but in our series there was definite increase in prothrombin time after intra-amniotic hypertonic saline. Talbert *et al* (1973) also showed prolongation of prothrombin time in their series. The euglobulin lysis time was greater than 120 minutes (Weiss *et al*, 1972). In our study also euglobulin lysis time was more than 120 minutes.

In our 36 cases of extraovular 0.1% acriflavin and 0.1% ethacredil lactate, there was rise in mean fibrinogen level after 6 hours and no significant change in platelet counts. There was no significant change of mean prothrombin time as against prolongation time in hypertonic saline group. There was also no change in euglobulin lysis time in Ethacredine Lactate and acriflavin group, but it was more than 120 minutes in hypertonic saline except in 4 cases. The patients who failed to abort with the above procedure were treated with hypertonic saline and showed slight fall in coagulation factors. This confirms that hypertonic saline is responsible for consumptive coagulopathy.

Bellar *et al* (1973) showed lack of coagulation defect after termination of pregnancy by catheter technique. The data indicates that if there is absorption of coagulation action material of the disintegrating placenta, it is not sufficient to induce consumptive coagulopathies. In contrast failed abortion by catheter technique followed by instillation of hypertonic saline confirmed again the development of consumptive coagulopathies; suggesting indeed that same is responsible for consumptive coagulopathies. Gluck *et al* (1973) reported recently that there was no change in coagulation factors in cases terminated by prostaglandins.

It may be speculated that there is some release of coagulative material from disseminated placenta which prevents coagulopathies. However, the presence of saline even in low concentration sets up, by an as yet unknown mechanism change for a potentiation of this action.

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