

FETOMATERNAL HEMORRHAGE IN INDUCED ABORTION

by

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Introduction

Immunisation of Rh negative mother by her Rh positive fetus is a formidable problem. The fetal blood has an inherent capacity to excite an immunogenic antigen response in the mother during the course of pregnancy whether going to term or ending up in an abortion.

Clarke (1973) showed that immunisation was possible in two third of Rh negative mothers, where transplacental fetomaternal haemorrhage was of significant amount. Pollock *et al* (1974) in their series of 140 Rh negative women found 2% developing anti D. If it is an ABO compatible infant the incidence of immunisation is as high as 17% (Ascari *et al*, 1969).

Immunisation following abortion has been reported by several authors. This incidence of Rh immunisation by fetomaternal hemorrhage reported in different series varies from 0.25% to 6.3% (Simonovitis 1974; Matthews and Mathews 1969; Murray *et al* 1970).

With a view to understand the importance of fetomaternal hemorrhage in

induced abortions, 839 mothers who underwent M.T.P. upto 20 weeks were studied for blood group, FMH and antibodies.

Material and Methods

Cases were selected from those who came to seek abortion at our Family Welfare Clinic. These patients underwent MTP by various methods, such as suction curettage, intra-amniotic or extra-amniotic injections of abortifacients like prostaglandins, saline or ethacridine lactate and prostaglandin vaginal suppositories. Blood samples for grouping and FMH study were collected from the mothers on admission and after completion of abortion.

Staining of the blood smear was done by using the modified technique of Kleihaur, Brown and Betke. Fixed slides were kept for 20 seconds in the staining solutions (a mixture of 0.75% Hematoxylin and 2.4% FeCl₃ solution acidified by 2 ml. 25% HCl) and after rinsing with distilled water were counterstained by eosin 1%.

Slides were screened under both low and high power for 5 to 10 minutes. Slides showing some fetal cells were termed as positive. The positive slides were further studied for significant F.M.H. A count of more than 2 fetal cells per 200 adult cells was considered signi-

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ficant (Parikh *et al* 1971 and W.H.O. Bulletin 1971).

Antibody screening by saline and enzyme techniques were carried out in the serum of Rh negative mothers before and after abortion.

Results

Out of the 839 cases 36, 4.2% were Rh negative. Two hundred and seventy-eight 33.1% of the slides showed positive smears. Significant F.M.H. was found in 44, 5.2% of the total cases.

The incidence of F.M.H. at 6 weeks, none of the mothers showed significant amount of fetal cells. Between 7 to 12 weeks of gestation 2, 1.0% of mothers showed fetal cells. The incidence increased to 10, 4.4% in women between 13 to 16 weeks gestation, while patients of 17 to 20 weeks gestation showed the highest incidence 32, 14.0%.

Table I shows the relationship of the extent of F.M.H. with the type of procedure followed for M.T.P. In cases who had incomplete abortion requiring curettage, both the incidences of cases showing positive slides for fetal cells as well as significant fetal cell count were higher than those who aborted completely. In early and late mid trimester cases, the incidence of significant fetomaternal hemorrhage in complete and incomplete abortions was 0.9% and 7.5% and 9.5% and 18.3% respectively.

Table II shows the analysis of 36 Rh negative mothers. None of the 12 cases from 6 to 12 weeks gestation showed any fetal cells. Out of the 24 cases from 13 to 20 weeks gestation, 4 showed fetal cells, when abortions were incomplete requiring curettage. However, as this series is too small, the significant F.M.H. in complete and incomplete abortion cannot be correctly assessed from statistical point of view.

TABLE I
Relationship of Extent of FMH with Type of MTP Procedure

Gest weeks	M.R.			Suction			Curettage for Incom. abort.			Complete abortion		
	Total	FEC+ve	SIG.	Total	FEC+ve	SIG.	Total	FEC+ve	SIG.	Total	FEC+ve	SIG.
<6	192	30 (15.6%)	-	-	-	-	-	-	-	-	-	-
7-12	-	-	-	195	43 (23%)	2 (1.0%)	-	-	-	-	-	-
13-16	-	-	-	-	-	-	120	68 (56.6%)	9 (7.5%)	107	15 (14%)	1 (0.9%)
							120	75 (62.5%)	22 (18.3%)	105	46 (43.8%)	10 (9.5%)

TABLE II
Analysis of Rh Negative Cases

Gest. weeks	No. of cases	M.R.		Suction		Curettagé for Incom. Abort.		Complete Abortion	
		Total	F.M.H. SIG.	Total	F.M.H. SIG.	Total	F.M.H. SIG.	Total	F.M.H. SIG.
6	9	—	—	—	—	—	—	—	—
7-12	3	—	—	2	—	—	—	1	—
13-16	6	—	—	3	—	3	1	—	—
17-20	18	—	—	—	—	16	2	2	1
Total	36	9	—	5	—	19	3	3	1

Discussion

In pregnancies of less than 6 weeks, though there was transplacental hemorrhage to the extent of 15.6%, there was no significant fetomaternal hemorrhage detected. Simonovitis *et al* (1967) found that risk of immunisation increased with gestational age. He found it to be virtually negligible at 1 month, appreciable at 2 months (2%) and substantially increased at 3 months (9%). In pregnancies under 12 weeks the fetomaternal leak is less as the total fetal blood volume is about 4.5 ml only. It could be that we failed to identify the early megaloblasts or primitive erythrocytes with Hb of Grover type by our present technique. However, it has been proved that even these primitive red blood cells do contain intact and well developed Rh factors on them.

Gallen *et al* (1964) showed a marked increase in the number of fetal cells in maternal blood after induced mid-trimester abortion. Similar observation has been made in our present series, too. In induced abortion in women with gestational age of more than 15 weeks where a complete umbilical circulation is present with appreciable volume of fetal blood and an intact placenta, the fetal blood leak is massive.

The larger dose response of antigen resulting from F.M.H. at termination is believed to prime the mother's immune system, subsequently, when the immunosuppressive action of hormones of pregnancy is withdrawn. Consequently she produces demonstrable antibodies. In Rh negative mothers who undergo induced abortions, the risk of immunisation increases with increase in gestation. The risk of immunisation in induced abortions is greater than those who have spontaneous and missed abortions. Thirty-two Rh negative cases who had spontaneous or

missed abortion showed no evidence of F.M.H. Repeated antibody screening also proved that they had escaped Rh immunisation. Queenan *et al* (1971) in their report have also opined that women with spontaneous abortions carry very little risk of immunisation.

It is well known that in a normally developing embryo the earliest fetal erythrocytes can gain entry into maternal circulation is 4 weeks after conception. In missed and spontaneous abortion various maternal and genetic factors hinder the development of the embryo namely the fetus and the placenta. The fetus being abnormal and nonviable, the chances of live, intact fetal erythrocytes crossing the ill-developed placenta is remote. In many of the cases, the conceptus is already dead and the placenta is inactive. The precipitating factor is the regressive decidual changes like necrosis and hemorrhage, as a consequence of which the placenta starts separating with the dead fetus. Hence F.M.H. is insignificant in these types of abortions.

We have found that in our series of 283 Rh immunised cases, there were 3 mothers who were primiparous but demonstrated Rh antibodies. The cause of immunisation was induced abortion in second trimester prior to the present pregnancy, which was disclosed to us later on asking.

We have used various abortifacients as detailed earlier. There has been no significant difference in F.M.H. between the different abortifacients. However, the abortifacient which leads to the least incomplete abortion will be more desirable, particularly for Rh negative mothers, as the F.M.H. is significantly lower in women who abort completely as compared to those where curettage was necessary.

The need of anti D immunoglobulin for preventing immunisation after an induced abortion is as important as at term pregnancies. Robertson *et al* (1978) found that 20 μgm Rh immune D negates about 1 ml. fetal blood. Cases in first trimester can thus be managed on small amounts of 50 μg as the average of fetomaternal leak has been reported to be 2.5 ml. In such cases of induced abortion, a study of F.M.H. can be done to realise the extent of leak and the dose of Rh immune D can be proportionately increased.

Adequacy of treatment can be judged by looking for fetal cells in maternal blood smear after 48 to 72 hours of treatment.

Thus it confirms that the autoimmune hazards is a possible sequelae of induced abortions. Blood grouping is therefore mandatory before termination of pregnancy and the use of Rh immune D for all Rh negative women undergoing M.T.P.

Summary

Eight hundred and thirty-nine patients who came to seek abortion facilities underwent termination of pregnancy by various techniques from suction curettage to intra and extra-amniotic injections of different abortifacients, e.g. saline, ethacridine lactate and prostaglandins. 4.2% of the cases were Rh -ve. Fetomaternal haemorrhage was studied in these patients by modified Kleihaur's technique. Slides showing more than two fetal cells per 200 adult cells were considered significant. 5.2% of the patients showed significant feto-maternal haemorrhage (FMH). The chances of immunisation increased with increased weeks of gestation. There was no significant difference in FMH between the different abortifacients. However, the abortifacient which leads to the least incidence of incomplete abortion was most desir-

able as patients with incomplete abortion had higher incidence of FMH as compared to those with complete abortion. The need of adequate anti D immunoglobulin induced abortion in Rh -ve women is emphasized.

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