TRANSPLACENTAL HEMORRHAGE IN MID-TRIMESTER PREGNANCY TERMINATION—A COMPARATIVE STUDY@

by

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Introduction

Termination of pregnancy is one of the important obstetrical operations which all of us encounter since the liberalization of abortion law in India. Although all operative procedures should be safe, the procedure which has a minimum morbidity is always more attractive.

This is a compartive study of 50 cases of II trimester induced abortions, done by various methods, for the purpose of assessing the transplacental fetomaternal hemorrhage by each method and the protective role played by the ABO incompatibility in protecting the mother from sensitization as a result of fetal cell leak.

Hence the clinical application of this study is in choosing the method of M.T.P. in a Rh –ve mother, which would give a minimal cell leak and reduce the risk of immunization.

Material and Method

Fifty cases between 14 and 20 weeks of gestation were selected for M.T.P. by intra-amniotic route. Twenty-six of them were primigravidae. Following blood samples were collected for the study:

1. Mother's blood (1 c.c. in double oxalated bulb) prior to I/A injection, to eliminate the pre-existent transplacental hemorrhage (T.P.H.) and also to determine mother's blood group.
2. Cord blood at delivery to determine fetal blood group.
3. Mother's blood just after the expulsion of fetus and placenta (spontaneous or surgical). This sample was considered as '0' hour sample.
4. 2 hours after abortion.
5. 6 hours after abortion.

Table I shows the drugs used for I/A instillation.

Method of Measuring Fetal Cell Leak

The identification of fetal cells in maternal circulation is done by cytochemical method of acid—elution which is based on the fact that Hb F is resistant to treatment with acid and after elution,

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TABLE I
Drugs Used For I/A Instillation

Drugs used for I/A instillation	Cases
1. 80 gms Urea + 10 mg PGF_2	17
2. PGF_2 mg	7
3. PGF_2 40 mg + 20 mg after 24 hours	8
4. 20% saline (200 ml.)	5
5. 20% saline + I.V. Pitocin	13
	50

TABLE II
Conversion of T.P.H. in ml.

Fetal Cells	Leak in ml.
1 - 4	0.15
3 - 8	0.25
8 - 16	0.50
14 - 24	0.75
19 - 32	1.00
41 - 64	2.00
63 - 96	3.00
105 -157	5.00

the fetal cells retain their Hb and stain pink. We have used Nierhan's and Betke's modification of Kleihaur's technique (ref. 8). Slides are examined under H.P.F. to identify the following:

1. Fetal Cells:
   Well defined edges
   Possessing Hb and stained red
2. Adult cells:
   Ghost cells with no Hb
   Pale pink
3. WBC's:
   Larger size
   nucleated
   darker than normal RBC
   grey cytoplasm

The no. of fetal cells amongst 100,000 maternal cells are noted and fetal cell leak in ml. is calculated from Table II (courtesy B.G.R.C.). This table is prepared from a graph plotted according to in-vitro serial dilution of a known quantity of mother's blood, against the no. of fetal cells seen per 100,000 maternal cells.

Observations and Conclusions

Table III shows that out of a total 50 cases studied, as many as 23 cases had no leak; 27 cases i.e. 54% showed presence of fetal cell leak, and in 13 of these the no. of fetal cells in maternal circulation decreased over a period of 6 hours. This shows that in nearly half the +ve cases, the fetal cells were being destroyed due to a multiplicity of unknown and known factors.

TABLE III
Incidence of T.P.H.

Total No. of cases	No leak	Leak +ve		Leak decreasing		
		cases	%	cases	% of +ve cases	% of Total
50	23	27	54%	13	48%	26%

But it is seen that incidence of fetal cell leak in II trimester M.T.Ps is definitely higher than in I trimester M.T.Ps, which is quoted between 5 and 35% by various authors or that after a normal delivery which is 5-10% Brown (1963), Chown (1954) and Cohen (1964).

Table IV shows the no. of the cases and the amount of leak by different methods

TABLE IV
Amount and Incidence of T.P.H.

Method	No. of cases	+ve cases	Mean max. leak (ml)
1. Urea + PG (10)	17	11	0.68
2. PG (40)	7	4	0.85
3. PG (40+20)	8	8	0.70
4. Saline	5	0	0.00
5. Saline + pitocin	13	4	0.33

of pregnancy terminations. The amount of T.P.H. is nearly the same by the first 3 methods namely, urea +PG, $PGF_{2\alpha}$ 40 and $PGF_{2\alpha}$ 40 + 20 but the incidence of +ve cases was the highest when $PGF_{2\alpha}$ 40 + 20 was employed. The amount and the incidence of T.P.H. using saline is the lowest. The incidence of blunt curettage with saline is low, as abortion is usually complete, which also contributes to the lesser amount of fetal cell leak. Moreover, intra-uterine fetal death due to umbilical vessel thrombosis may also be one of the reasons.

Eight patients out of 50 showed a leak prior to M.T.P. (Table V), and of these 6 were primigravidae. A higher leak of 1 ml. or more was seen mainly in the multigravidae.

TABLE V
T.P.H. and Parity

Gravida	Prior sample +ve	Leak in ml. 0	0.1-0.25	0.50-0.75	1	Total
Primigr.	2	15	7	6	1	29
Multigr.	6	10	2	6	5	21
						50

Table VI shows that out of 34 ABO compatible cases, T.P.H. occurred in 11 cases (66%), while out of 13 ABO incompatible cases, leak was present only in 2 cases (15%). This shows that ABO incompatibility does reduce the amount of effective leak by destroying the fetal cells. Cohen (1967) had similarly studied post partum cases and shown a leak in 20% of ABO compatible cases and in 5% of ABO incompatible cases.

TABLE VI
T.R.H. and ABO Blood Groups

	No. of cases	Decreasing or No leak	Leak + ve
ABO Compatible	34	22	11
ABO Incompatible	13		
Fetal Bl. grp.		11	2
undetermined	3		

From Table VII it is seen that the percentage of –ve cases as well as the least amount of T.P.H. was seen at the extremes of fetal weights, i.e. 100 gms. and 400 gms. The results of Table VII are shown in a graphical manner in Fig. 1.

Readings of 2 interesting cases are shown below:

	Prior	'0' hr.	'2' hrs.	'6' hrs.
T.P.H.	0 ml.	0.75	0.25	0.25
T.P.H.	0.75 ml.	0.2	0.2	0.2

In these ABO compatible cases, a curettage was done, yet T.P.H. was decreasing, signifying some other mechanism of protection.

TABLE VII
T.P.H. and Fetal Weight

Fetal wt. (gm)	100	100-200	200-300	300-400	400
No. of cases	11	16	7	8	8
Negative	9 (86%)	5 (31%)	2 (28%)	3 (27%)	6 (75%)
Mean Max. leak (ml)	0.02	0.78	0.13	0.31	0.06

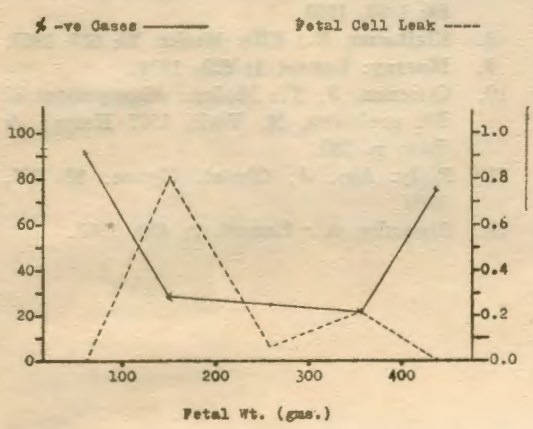

Fig. 1. Shows the results of Table VII, graphically

	Prior	'0' hr.	'2' hrs.	'6' hrs.
T.P.H.	0.75	0.2	0.5	0.25

In this case ABO incompatibility was present and T.P.H. appeared in spurts and the fetal cells seem to be destroyed intermittently.

Discussion

The incidence of gross T.P.H. of 0.1 c.c. following M.T.P. is quoted between 15-25% by various authors and a T.P.H. of 1 c.c. occurred in 50% of the patients.

If the fetus is ABO compatible, the risk increases with difficult deliveries, twins, stillbirths, assisted breech deliveries or wherever there is operative interference which damages the placental site. eg. M.R.P., caesarean, and even a bloody tap during amniocentesis. The mean quantity of leak quoted by Zipursky *et al* (1963) is 1 ml. In normal delivery, Antenatal incidence of T.P.H. is 1% and the leak is 0.25 ml. Postnatal incidence is 5-10%. Leak is 0.25 to 3 ml. 1-8 ml. in caesarean section, 1-6 ml. in M.R.P. and even upto 20 ml. 10-50 ml. in an unsuccessful amniocentesis.

As reported by Murray *et al* (1970) the T.P.H. incidence following M.T.P. by any method is 11% and is more frequent in cases less than 14 weeks gestation. The leak is about 0.25 ml. Different authors quote the incidence between 5-35%.

Comparing this with II trimester abortions, the incidence in this series is 54% and the amount of leak ranges from 0.5 to 3 ml. Hence it is important to choose a method in a Rh -ve woman which causes the least amount of T.P.H., and cover her with anti-D injection after M.T.P. as well as prior to next pregnancy to prevent sensitization.

It is clearly seen here that I/A hypertonic saline or saline with I.V. pitocin gives the lowest incidence of T.P.H. The amount of leak is also the least. Hence though the choice of drugs is an obstetrician's choice, we would suggest that atleast for a Rh –ve mother, the use of I/A saline would certainly minimize the risk of iso-immunization.

Summary

In the present series of 50 cases of II trimester M.T.P.s the amount of T.P.H. was measured and the effect of ABO incompatibility on T.P.H. was studied. Detailed blood examinations were carried out for fetal R.B.C.S. Staining was done by Nierhan's and Betke's modification of Kleihaur's technique.

It was observed that the amount of T.P.H. was more in multigravidae than in primigravidae. Also some degree of T.P.H. is present in almost half the multigravidae through previous pregnancies. The T.P.H. with hypertonic saline was the least.

And lastly, it is concluded that ABO incompatibility between the mother and the fetus does influence the development of Rh-isoimmunization.

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