TRANSPLACENTAL HAEMORRHAGE FOLLOWING MEDICAL TERMINATION OF PREGNANCY

(A study of 400 cases using different methods)

by

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SUMMARY

Four hundred patients attending the family welfare clinic for the purpose of M.T.P. were studied for T.P.H. before and after M.T.P. The various methods included suction curretage, menstrual regulation, extraovular ethacradine, and intraamniotic saline. 4.75% of the cases had T.P.H. before termination and were mainly after 8 weeks of gestational period. The severity of T.P.H. was minimal (Gr. I) before termination of pregnancy. The incidence of T.P.H. was 22% after termination of pregnancy and the severity was higher in second trimester abortions and whenever oxytocics are used. The method used for detecting T.P.H. was as described by Kleihauer and Betke (1968) and the grading of the severity of T.P.H. is outlined. The need and the formula for giving exact amount of anti D in cases undergoing M.T.P. has been outlined.

Fetomaternal transfusion is the transplacental passage of foetal erythrocytes into the maternal circulation, not an uncommon occurrance during late pregnancy, at the time of spontaneuos or induced abortion and at the time of delivery. Since the legalisation of abortion, the number of patients undergoing M.T.P. has considerably increased. One of the risk associated with M.T.P. is the development of active antibodies to Rh antigen in Rh negative mother because of transplacental haemorrhage (T.P.H.). The amount of transplacental haemorrhage (T.P.H.) must be known before giving Anti D because if the amount is massive the usual dose of Anti D will not take care of all Rh positive cells and there will again be risk of sensitisation. The present study was undertaken to find out the extent of transplacental haemorrhage (T.P.H.) during various procedures of M.T.P. and to determine the factors which can increase the possibility of transplacental haemorrhage.

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Material and Methods

Transmission of foetal cells into the maternal blood was detected by using Kleihauer and Betke acid elution technique (1968). The whole blood was diluted with an equal quantity of saline, films were made on slides from this diluted blood and were allowed to dry. The slides were fixed with 80% ethanol for 5 minutes at room temperature and were then placed in elution solution (Table I)

TABLE I
Preparation of Elution Solution

Stock solution	A = 0.75% haematoxylin in 80% ethanol
Stock solution	B = 2.4 grams of $FeCl_3$ + 2 ml. 25% HCl + distilled H_2O upto 100 ml.
Elution solution	= Solution A (2 parts) + Solution B (1 part) + 80% Ethanol (1 part)

* (pH of solution obtained is 1.5 and can be used for 6 weeks).

for 20 seconds. These were then counterstained with 0.5% eosin or 0.1% erythrosin for 2 minutes. At least 50 fields were examined using 1/6 objective lens.

This method produces good films with foetal cells being easily distinguishable. The white cells including lymphocytes stain grey. The adult red cells appear as "ghost" cells (since only their faint outline is distiguished) while foetal cells stain dark red. (Fig. 1).

The foetal cells were counted/1000 maternal R.B.C. According to the counting of R.B.C.'s in the maternal blood, the amount of T.P.H. was determined and was given grading of severity as shown in Table II.

The maternal blood was collected in a 10 c.c. heparinised syringe before and within 24 hours after the termination of pregnancy.

Observations

Table III shows the incidence of T.P.H. before and after termination of pregnancy. The cumulative incidence was 22% after M.T.P. It is observed that upto 8 weeks, there is no T.P.H. before M.T.P. but after M.T.P. 5-6% of the cases showed minimal (Gr. I) T.P.H. During 8-12 weeks, before termination the incidence was 5% minimal (Gr. I) but after termination there were 10% with minimal (Gr. I) and 5% with small (Gr. II) T.P.H. The moderate (Gr. III) transplacental haemorrhage was seen following termination in 12-14 weeks gestation, whereas in only 2% of cases with 14-20 weeks gestation T.P.H. was large (Gr. IV). In none of the cases the T.P.H. was massive (Gr. V). It is clear that the incidence and severity of T.P.H. increases with the increase in gestational age.

TABLE II
Grading of the Severity of Transplacental Haemorrhage

Fetal cells/1000 maternal R.B.C.	Amount of blood in ml.	Grading
1 - 2	0.1 - 0.2	Minimal (Gr. I)
3 - 4	0.3 - 0.4	Small (Gr. II)
5 - 6	0.5 - 2.5	Moderate (Gr. III)
7 - 15	2.5 - 10.00	Large (Gr. IV)
15 - 20	More than 10.00	Massive (Gr. V)

TABLE III

Incidence of T.P.H. in % Before and After Termination

Weeks of Gestation	No.	% +ve cases before termination	% +ve cases after termination and severity
Upto 6 weeks	50	—	6% Minimal
6- 8 weeks	100	—	5% Minimal
8-12 weeks	100	5% Minimal	10% Minimal 5% Small
12-14 weeks	50	4% Minimal	16% Small 6% Moderate
14-20 weeks	100	6% Minimal	10% Moderate 2% Large
Total:	400	4.75%	22%

An attempt was made to correlate the incidence and severity of transplacental haemorrhage with methods of M.T.P. (Table IV). The incidence and severity was least in cases of menstrual regulation and was maximum following second trimester abortion using intraamniotic saline. It was also observed that whenever oxytocics either methergin or pitocin was used, the incidence and severity of T.P.H. was higher irrespective of the method of M.T.P. (Table V).

TABLE IV

Fetomaternal Transfusion Methods of M.T.P.

Method	No.	% +ve before operation	% +ve after operation and severity
Menstrual regulation	50	—	6% Minimal
Suction evacuation	200	2.5% Minimal	7.5% Minimal 2.5% Small
Extra Ovular Ethacridine	50	4% Minimal	16% Small 6% Moderate
Intraamniotic saline	100	6% Minimal	10% Moderate 2% Large
Total:	400	4.75%	22%

TABLE V

Effect of Oxytocics on T.P.H.

Method	(No.)	Oxyoics usage	(No.)	T.P.H.
Suction	(200)	Oxytocics	(150)	6.6% Minimal 3.3% Small
Evacuation		No oxytocics	(50)	10% Minimal
I.A. Saline	(100)	Oxytocics	(40)	17.5% Moderate 5% Large
		No oxytocics	(60)	5% Moderate
E.O. Ethacridine	(50)	Oxytocics	(20)	20% Small 15% Moderate
		No oxytocics	(30)	13.2% Small

Discussion

A.C.O.G. Bulletin No. 13 goes so far as to say that anti D should be administered to all unsensitised Rh. negative mothers within 72 hours of spontaneous or therapeutic abortion. Similar statements have been made by others. (Mathews and Mathews 1969, Parikh *et al* 1971).

In normally developing pregnancy, the earliest foetal cells can gain access to the maternal circulation is 4 weeks after conception. These early circulation cells are made up of megaloblasts. The earliest demonstration of Rh. antigen on these megaloblasts was reported by Bergstrom (1967) at 38 days gestation. If these cells gain access to maternal circulation in enough quantity, they can evoke immune response, as early as 6-8 weeks.

We could demonstrate foetal cells in maternal circulation in minimal quantities as early as 6 weeks. Simonovitis (1971) found that the risk of iso immunisation increased with increase in gestational age. He found it to be virtually negligible at 1 month, appreciable at 2 months (20%) and substantially increased at 3 months (9%). In pregnancies less than 12 weeks fetomaternal leaks are less as totol blood volume is only 4.5 ml. In our series the incidence of fetomaternal leak was proportional to the gestational period. Also the severity of the leak was higher in cases with gestational period more than 12 weeks.

Gallen *et al* (1964) showed a marked increase in the number of fetal cells in the maternal blood after induced mid-trimester abortion. Similar observations were made in our series viz. 10% moderate (Gr. III) and 2% large (Gr. IV) as compared to 7.5% minimal (Gr. I) and 2.5% small (Gr. II) in suction evacuation. 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 developed placenta, the fetal blood leak is massive.

Similarly, whenever oxytocics are used along with the procedure for M.T.P. the incidence and severity of T.P.H. is higher irrespective of the method of M.T.P. Therefore, whenever oxytocics are used concurrently, one must keep in mind

higher incidence of T.P.H. and give anti D accordingly.

The need to give Anti D after induced abortion for preventing immunisation is as important as after term pregnancy. Robertson (1978) found that 20 μgms. of Anti D negate about 1 ml. of blood. Cases in first trimester then can get about 50 μgms. as the average T.P.H. is less than 2.5 ml.; whereas in second trimester termination the amount of T.P.H. is much higher and they require larger dose of Anti D. It is essential that study of T.P.H. can be done to realise the extent of leak and the dose of Anti D can be proportionately increased. Adequacy of treatment can be judged by looking for fetal cells in maternal smear 24-48 hours after treatment.

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References

1. ACOG Bulletin No. 13, June 1970. Quoted from Am. J. Obstet. Gynec. 113: 158, 1972.
2. Bergstrom, H., Nilson, L. A., and Ryttinger, L.: Am. J. Obstet. Gynec. 999: 130, 1967.
3. Gallen, J., Kovaco, Z., Szontag, F. E. and Broda, D.: Brit. Med. J. 2: 1471, 1964.
4. Kleihauer and Betke: Clin. Wschr. **35:** 637, Quoted from practical haematology by J. V. Dacie and S. M. Lewis, 4th Ed., London, J. A. Churchills & Co. 1968, 107.
5. Maatthews, C. D. and Matthews, A. E. B.: Lancet, **1:** 694, 1969.
6. Parikh, N. P., Dubey, A. K., Sharma, R. S. and Bhatia, H. M.: J. Obstet. Gynaec. India. 21: 31, 1971.
7. Robertson, J. C.: Advances in Obstet. and Gynec. (Williams & Wilkins) 210: 1978.
8. Simonovitis, S.: Vox. Sang. **26:** 361, 1971.

See Fig. on Art Paper VI