

A COMPARATIVE STUDY OF PLACENTAL TRANSMISSION OF FOETAL ERYTHROCYTE IN MATERNAL CIRCULATION BETWEEN SPONTANEOUS ABORTION AND PREGNANCY TERMINATION CASES

by

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Introduction

Kleihauer, *et al.*, (1957) described an acid elution technique for demonstrating foetal erythrocytes in maternal circulation during pregnancy and after delivery. Since then other authors have studied foeto-maternal transfusion in normal and abnormal pregnancy and labour. Ghosh and Agarwal (1970) studied transplacental haemorrhage in cases of incomplete abortion and found significant result.

The present study was undertaken to study placental transmission of foetal cells in spontaneous abortion and pregnancy termination cases.

Material and Method

100 cases were studied in Kamala Nehru Memorial Hospital, Allahabad and Allahabad Agricultural Institute Naini, Allahabad.

45 cases of incomplete abortion.

15 cases of complete abortion.

40 cases of pregnancy termination under 12 weeks.

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A complete history including age, parity, menstrual history and obstetric history was taken. Any relevant facts of previous abortions were noted.

Complete physical check-up including blood pressure record, cardiovascular and respiratory system examination were done. Abdominal and vaginal examinations were also done. In pregnancy termination cases dry dot test in urine was done. Peripheral blood films were made of pregnant mothers and were repeated after curettage or after spontaneous abortion and again after 3 weeks of termination of pregnancy. Regarding incomplete abortion cases the first smear was taken at the time of admission and then after curettage. The films were examined for the presence of foetal red cells by the Acid Elution Technique.

Controls

Positive and negative controls were used each time, when the slides were stained. Positive control smears were prepared from fresh cord blood of new born babies. Negative control smears were prepared from normal adult males in Kamala Nehru Memorial Hospital, Allahabad and Allahabad Agricultural Institute, Naini Allahabad. These positive and negative control slides were treated with acid phosphate buffer along with the slides of peripheral blood films of pregnant mothers.

Foetal haemoglobin is more resistant than adult haemoglobin to denaturation, not only by alkali, but acid also. Thus at the PH—3.5, adult haemoglobin will be eluted from the R.B.C., but foetal haemoglobin will remain in the red cells and can be stained.

Procedure

The peripheral blood films were prepared and fixed in 80% alcohol for 5 minutes. The slides were washed gently with distilled water and air dried. They were immersed in citrate phosphate buffer at PH 3.5 at 37°C for 5-10 minutes. The buffer was made fresh on the day it was to be used. The slides were washed gently with distilled water and stained with acid haemotoxylin for 5 minutes after which they were again washed in distilled water gently but completely. They were stained with eosin for 5 minutes, washed in running tapwater for one minute, air dried and mounted under dried cover slip.

Each slide was scanned for 5 minutes, the smears which showed only one foetal cell in 5 minutes scanning were considered as negative Finn *et al.*, (1961). Adult red blood cells which contained adult haemoglobin appeared only as ghosts cells. The cells containing foetal haemoglobin stood out clearly as pink refractile bodies.

Dry Dot Test

Dried anti human chorionic gonadotrophin serum as a dry drop on a paper strip and H.C.G. coated latex suspension dried (yellow coloured) were kept side by side. One drop of water was kept on dried H.C.G. coated latex suspension. One drop of urine was kept on dried anti human chorionic gonadotrophin and mixed well for 30 seconds. Now both drops

were mixed properly and paper strip was moved to and fro for 2 minutes. If flocculation was present the test was negative. If clear yellow colour was seen the test was considered to be positive.

Method of Pregnancy Termination by Weeks of Gestation

Pregnancy less than 6 weeks were taken under menstrual regulation study, in which uterus is evacuated by suction created by a 50 cc syringe which is known as menstrual regulation syringe. From 6 weeks to 11 weeks pregnancy cases have been terminated by vacuum aspiration (electric machine).

Observation

45 cases of incomplete abortion in which curettage was done afterwards and 15 cases of complete abortion were taken in the present study. The results of incomplete abortion and complete abortions (spontaneous) are shown in Table I.

TABLE I

Incidence of Foetal Erythrocyte Percentage in Maternal Circulation in Incomplete and Complete Abortion group of Cases

Period of gestation in weeks	No. of cases	No. of positive cases	Percentage
6-8	15	2	13.33
9-12	20	5	25.00
13-16	12	3	25.00
17-20	5	1	20.00
21-24	6	3	50.00
25 and more	2	1	50.00

40 cases of pregnancy terminations were also studied in the present series. The results are shown in Table II.

In 30 cases, which were upto 8 weeks, complications were not much and none of the cases required second curettage. In all these cases slides were repeated after

TABLE II

Shows the Incidence of Percentage of Foetal Erythrocytes in Maternal Circulation in Pregnancy Termination Cases

Period of gestation	No. of cases	No. of positive cases after curettage	Percentage	So. of cases after three weeks	Percentage
Less than 6 weeks	8	0	0.0	0	0.0
6- 8 weeks	22	2	18.1	0	0.0
9-11 weeks	10	3	30.0	2	20.0

3 weeks and none of the cases showed foetal cells.

Out of 10 cases which were between 9-11 weeks, 2 cases bled for more than 15 days and needed second curetting. Both these cases showed foetal cells in slides which were taken just after recuretting.

Discussion

The above study of a total 100 cases, including 60 spontaneous abortions (45 incomplete abortion and 15 complete abortions) and 40 pregnancy termination was undertaken to find out whether pregnancy termination has got any significant effect on the incidence of transplacental haemorrhage in the mother.

The data of present study indicate that the incidence of transplacental haemorrhage is high in cases of incomplete abortion (13.33% to 50%). Similar findings were confirmed by Ghosh and Agarwal, (1970). Freese and Titel, (1963) noted the presence of foetal cells after 8th week, while Taylor and Kullman (1961), Clayton *et al.*, (1964, 1966) detected it after 16 weeks of ante partum period. The cases which aborted after 20 weeks the percentage of foetal cell positive cases was much higher (50%). The incidence is similar to that of the normal pregnancy (Mukerjee *et al.*, 1972).

Regarding pregnancy termination cases

the percentage of foetal cell is more or less same as that of spontaneous abortion group. None of the cases which were terminated before 6 weeks had foetal cells in the maternal circulation. In those cases where duration of pregnancy was more than 8 weeks, 20% cases needed second curettage and in such cases incidence of transplacental haemorrhage was found to be 100%. This observation is of great significance in Rh negative mothers, specially with homozygous Rh positive fathers, as risk of Rh immunisation is very great. So before doing termination of pregnancy in such cases it is desirable to consider the Rh factor of the mother. As the number of cases in the present series is very small further study is needed to confirm this observation.

Summary and Conclusion

1. A total 100 cases have been studied. Out of which 60 cases were of spontaneous abortion and 40 were of pregnancy termination. The data of present study show that the incidence of transplacental haemorrhage is higher in abortion cases, whether spontaneous or induced, as compared to normal pregnancy and labour.

2. The cases where duration of pregnancy was more than 8 weeks 20% needed second curettage within 15 days of termination.

3. The cases where second curetting was needed incidence of transplacental haemorrhage was found to be 100% which is of significance in Rh negative females.

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