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Research Article

PLACENTAL HISTOMORPHOLOGY: A PREDICTOR OF FOETAL OUTCOME IN MULTIPAROUS WOMEN

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ABSTRACT

Anaemia being a constant feature of the multigravida mothers causes significant changes in placenta which are responsible for early termination of pregnancy, resulting in low birth weight babies and an increase in perinatal mortality and morbidity. **Methods** In this study, we have correlated the decreased gestational period of ninety multigravida mothers with that of the same number of primigravida mothers by evaluating the histomorphological features of placenta in these groups. Here we have taken anaemia as the lone factor for the change in histomorphological pattern of placenta thus leading to poor foetal outcome. **Result** Our study concludes that, with the increase in parity there is a significant increase in the severity of anaemia during pregnancy, and consequent decrease in the gestational period of the mother resulting in poor foetal outcome.

Keywords: Perinatal mortality, Pregnancy anaemia, Placental morphology, Placental histology

INTRODUCTION

The changes seen in the histomorphology of placenta in pregnancy anaemia are also seen in multigravida mothers. This is because high parity of mother results in high grade anaemia¹, which is primarily caused by repeated blood loss in multigravida mothers². It is seen that the histomorphological features of the placenta change according to the level of maternal haemoglobin so as to compensate hypoxia. As WHO³ has put forward a criteria that, level of haemoglobin below 11gm/dl is an indication of anaemia in pregnancy the multigravida mothers were labelled anaemic as they were found to have haemoglobin level below 11gm/dl.

Although placental histomorphology changes with the change in pregnancy anaemia so as to compensate the hypoxia caused due to low hemoglobin but still there comes a level below which histomorphological changes in placenta are

not sufficient to sustain pregnancy further, thus leading to poor foetal outcome.

MATERIALS AND METHODS

This is a Case Control study for which ethical clearance was taken before conducting study on 180 placentae, procured from mothers delivered in Indresh hospital Dehradun. Placenta of Primigravidae i.e. (control group N=90) and Multigravidae i.e. (study group N=90) were taken for study, where most of the mothers were of third or fourth gravida and Mean age of both groups was between 25-35 yrs.

General particulars of mother were taken in both the groups with detailed history and general examination with routine investigations was done and haemoglobin level was noted in all the cases. The placenta, after their delivery were cleaned and

prepared for histomorphological examination. Weight, volume and number of cotyledons in placenta were noted for morphology. Then the tissue of the size of 2 microns was prepared for staining with haematoxylin and Eosin dyes and mounted on glass slides for histological study. Observations thus obtained were analyzed statistically and P Values were found out by using Microsoft excel.

RESULTS

Table 1: Showing ratio of anaemic and nonanaemic cases in both groups

Groups	Anaemic Group	Non-anaemic Group
Primigravida Group	33%	67%
Multigravida Group	67%	33%

As shown in table 1, anaemia in primigravida mothers was found to be in less number of cases [33%] as compared to anaemic cases of multiparous mothers [67%].

Whereas in the multigravida group of mothers the ratio of anaemic and nonanaemic cases was just the reverse.

Table 2: Mean placental weight and volume in both groups

Group	Mean Placental weight (gms)	Mean Placental Volume(cc)
Primigravida	480+/-8	360+/-6
Multigravida	300+/-10	290+/-8
P value	<0.005	<0.005

According to table 2, shown here the mean placental weight and volume of the placenta decreases to 300 Gms and 290 cc respectively in multigravida mothers as compared to the mean placental weight and volume of 480 grams, and 360cc respectively in primigravida mothers, considering Mean ± SE

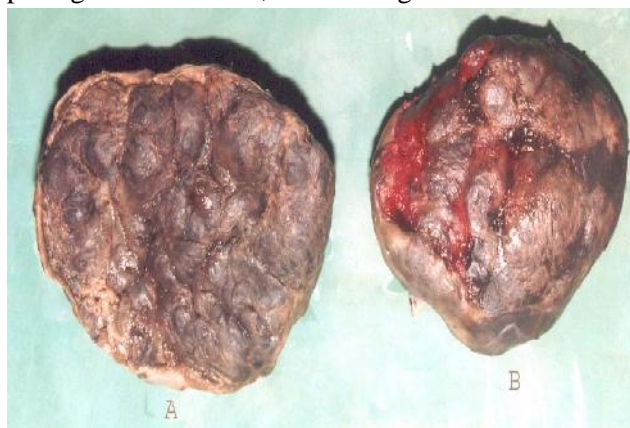


Fig 1: Gross morphology of the maternal surface of placenta.

A) Primigravidae B) Multigravidae – Size is smaller than the control group, and showing fewer cotyledons.

As shown in fig 1 the number of cotyledons in placenta decrease with the increase in parity of the mother i.e. in multigravida [study group].

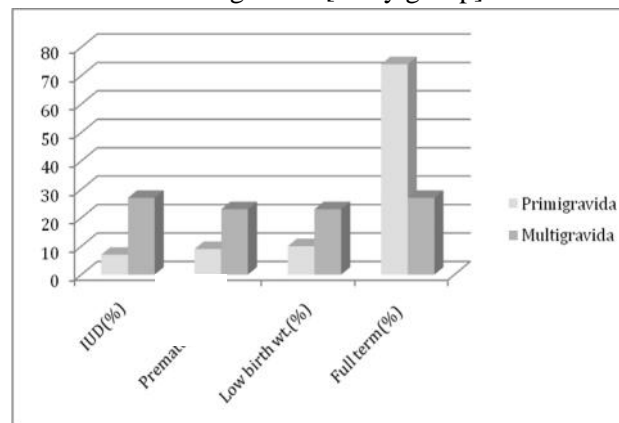


Fig 2: Showing comparative analysis of foetal outcome in primi and multigravid mothers

The foetal outcome showed a significant difference in both the groups i.e. the control and the study group, when taking anaemia as the lone factor under consideration.

As mentioned in Fig 2, the foetal outcome was very poor in multigravida [study group] as compared to primigravida [control group]. It was observed that [74%] of primigravida mothers gave birth to full term normal babies [10%] to low birth weight babies [9%] to premature babies and [7%] to intrauterine dead babies. Whereas in the group of multigravida mothers (27%) gave birth to intrauterine dead babies, (23%) gave birth to premature babies, again (23%) had low birth weight babies with only (27% having full term normal delivered babies

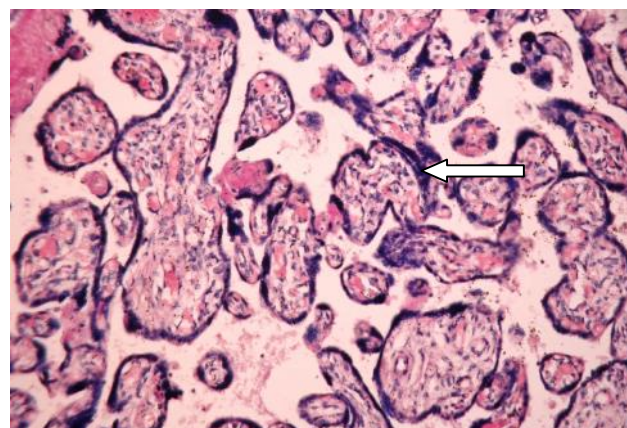


Fig 3: Photomicrograph of placental villi with intervillous spaces of the study group (multigravida) showing severe syncytial knots (400X)

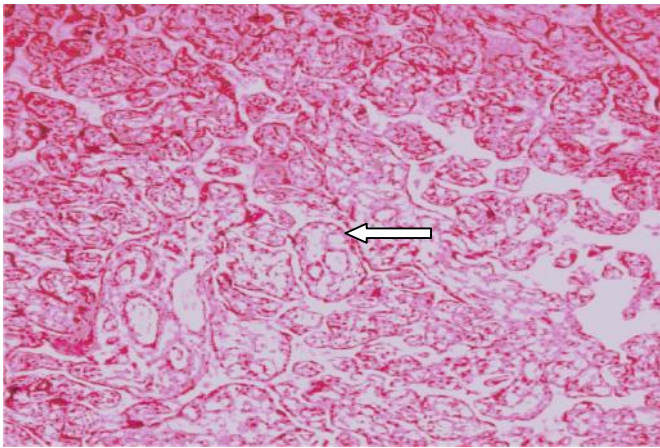


Fig 4: Photomicrograph of placental villi with intervillous spaces of study group (multiparous)

Showing one villous under [100X] with dilated and increased no.of capillaries per villus with their thinned out basement membrane. In Fig 3 the photomicrograph shows that there is an increase of syncytial knots in the placenta of multigravida mothers, whereas Fig 4 shows that there is also an increase in the capillaries per villi, and their dilatation with thinning of basement membrane in the placenta of multigravida mothers.

DISCUSSION

Our study goes in line with the findings of Pritchard Jack², according to whom blood loss during repeated pregnancies causes high grade anaemia. Our study was also similar to the findings of Olga⁴ who was of the opinion that maternal anaemia is associated with significant reduction in volume of terminal villous tree and surface area, mostly thought to be due to the physiological stress caused by hypoxia.

According to P N Singla⁵ there is less septation of placenta in hypoxic conditions caused by pregnancy anaemia, thus leading to decreased number of cotyledons, which is also seen in multigravida mothers. Burton⁶ has also found in his studies that raised capillary density and dilatation of sinusoids with accompanied thinning of villous membrane is the principle adaptation to hypoxia.

The criteria for labelling the foetal outcome in our study were also seen to be stated by Cunningham⁷ which was based on gestational age and weight of baby. According to him foetal death beyond 28 wks of gestation was termed as intrauterine death, baby born before the end of 37 weeks of gestation was considered as premature and after 37 weeks of pregnancy it was taken as full term normal delivered

baby. Taking weight as the criteria baby born with a birth weight of <250gms was labeled as low birth weight baby.

Hughes⁸ in his study has also reported of similar findings of shorter duration of gestation in pregnancy anaemia. To determine the placental abnormalities leading to poor foetal outcome with perinatal mortality, different methods have been used by many researchers with the Doppler velocimeters of the uterine and umbilical arteries.^{9&10} Also, some of the researchers have correlated this with sonographic studies.¹¹ Our study also correlates with other researchers on altered histomorphology of placenta in pregnancy anaemia, where according to them anaemia is the cause for altered placental histomorphology leading to placental malformation.¹²

CONCLUSION

In the present study the histomorphological changes of placenta in multigravida mothers, correlates to the hypoxic effects of anaemia, caused because of repeated blood loss during parturition in subsequent pregnancies.

These changes in placenta lead to early maturity of placenta, resulting in poor foetal outcome as prematurity, low birth weight babies or even intrauterine deaths. It was hence concluded that the increase in parity causes an increase in anaemia and results in an increase in prematurity and low birth weight babies or intrauterine deaths, which is further attributed to early maturity of placenta in hypoxic conditions again attributed to anaemia in multigravida mothers.

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