

Original Research Article

Effect of Anaemia on Morphology of Placenta and Fetal BirthWeight**Nisha Gajbhiye¹, Rajeshwari Kanwar¹, Nidhi Agrawal², Vandana Punase^{2*}**¹Associate Professor, Department of Anatomy, NSCB Medical College, Jabalpur, Madhya Pradesh, India²Assistant Professor, Department of Anatomy, NSCB Medical College, Jabalpur, Madhya Pradesh, India

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Abstract

Anaemia is a common medical problem in pregnancy. The extent up to which, maternal anaemia effects maternal and neonatal health is still uncertain. Anaemia in pregnancy is linked with an increased risk of preterm delivery, low birth weight, perinatal and maternal mortality and it is related with variable morphological changes in placenta which show a reflection for the poor foetal outcome. The aim of this study was to determine whether maternal anaemia would affect the morphology of placenta and fetal outcome like birth weight of the baby and compare this with that of nonanaemic mothers. It was a cross-sectional comparative study carried out at the maternity ward and anatomy department of NSCB Medical College, Jabalpur.

Keywords: anaemia, morphology, placenta & fetal

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Introduction

Placenta is one of the most challenging organs, its functions often hold the key to fetal developments. The word placenta comes from the latin word for cake, (from Greek "Plakoenta" for "Flat", slab like in reference to its round flat appearance in humans)[1]. Placenta is a villous haemochorial organ that not only helps in nutritive transfer and gaseous exchange between mother and the fetus but also act as a metabolic and endocrine organ both in maintenance and development of fetus. During pregnancy, range of problems may occur that could lead to foetal abnormalities and death[2]. Although these problems could arise from a variety of causes including chromosome and genetic disorders of the fetus (eg. Down's Syndrome), maternal illness (preeclampsia), and environmental factors (Eg. radiation), "The most important of them all is placental abnormality. A thorough study of placenta may record certain alteration which could be co-related with fetal and maternal conditions and which could be of value in term of predicting fetal outcome[3]. The placenta is a dynamic organ which is unique in its development and citions. It is the only organ in the body which is derived from two separate individuals, the mother and the foetus. The placenta is responsible for the spiratory, nutritional, excretory, endocrinal and the immunological functions of the foetus[7,8]. The anomalies of the placenta are usually associated with placental insufficiency, which could lead to complications in the foetus. Hence, a thorough examination of the placenta in-utero, as well as post-partum, gives valuable information about the state of the foetal well being[9,10]. In human the placenta usually has a disc shape. The usual full term placenta is about 22 cm in diameter and 2-2.5cm in thickness (greatest at the center and become thinner peripherally). The average weight is about 1/6 as much as the child that is about 500gm. Maternal surface of the placenta is dark maroon in color and divided into lobules called cotyledons[4,5]. The fetal surface of the placenta gray in colour, shiny and translucent. It connects to the fetus by an

umbilical cord of approximately 50-60 cm in length with a diameter of 2-2.5 cm. The normal cord contains 2 arteries and one vein. The umbilical cord inserts into the chorionic plate (has an eccentric attachment). Vessels branch out over the surface of the placenta and further divide to form a network covered by a thin layer of cells. This results in the formation of villous tree structures. On the maternal side, these villous tree structure are divided into cotyledons[6].

Material & Method

The study was carried out on 100 placentae, mothers and their babies. The placentae was collected from Obstetrics and Gynaecology, Department of NSCB Medical College, Jabalpur from September 2009 - September 2011. Out of 100 placentae 50 from anaemic and 50 from NON anaemic mothers.

Material

1. 100 placentae taken for the study, will be collected soon after delivery along with umbilical cord.
2. Weighing machine.
3. Inch tap.
4. Magnifying glass.
5. Dissection instruments.

A detail maternal history were taken, Routine laboratory investigations were noted, USG report recorded from clinical records, examination of baby in respect of birth weight, maturity, sex, apgar score etc were noted. Examination of placenta - weight, volume, diameter, shape, thickness, no of cotyledons, insetion of umbilical cord, any abnormalities etc. were noted

*Correspondence

Dr. Vandana Punase

Assistant Professor, Department of Anatomy, NSCB Medical College, Jabalpur, Madhya Pradesh, India.

E-mail: nisha.wahane34@gmail.com



Fig 1: Maternal surface of placenta and Fetal surface of placenta



Fig 2: Marginal insertion of umbilical cord & different shapes of placenta i.e. Oval round, irregular, triangular



Fig 3: Different size of placenta

Results

Table 1: Morphometry of Placenta and Birth Weight of Newborn

Group		Placental weight(gms)	Placental volume[ml]	Mean diameter	Thickness	No of cotyledons	Birth weight New born[kg]
Normal	Mean	425.00	352.5	17.05	2.16	16	2.7
	Std Deviation	69.92	58.88	1.81	0.29	2.3	0.29
Anaemic	Mean	474.63	393.23	18.30	2.4	13.24	2.4
	Std Deviation	70.194	63.67	2.03	0.57	3.1	0.42
Significance	t-A/B	2.83 p<0.05	2.72 p<0.05	2.7 p<0.05	6.57 p<0.05	4.38 p<0.05	2.47 p<0.05

If $t > 1.96$; $p < 0.05$ significant

If $t < 1.96$; $p > 0.05$ not significant

Discussion

In the present study the mean of placental weight anaemic group is found 474.63 gm (± 95.194) which significantly higher than control group. Beischer et al established an association between maternal

anaemia and placental hypertrophy which was significantly higher. Akin Agboola (1979) also found increased placental weight in anaemic group.

Mongia, Yadav, Jain also observed similar findings in anaemic group. In our study the mean of placental volume is found to be 393.23 ml (± 463.674) which is significantly higher ($p < 0.05$) than the control group. This findings were similar with study of Begum, Nurunnabi" (2005-2006) who correlate the difference between volume of the placenta of different grades of anaemia and normal cases and found that volume increased with increase in grade of placenta. This findings was in accordance with those of Mongia, Jain, Yadav, (2011).

The shape of placenta in anaemic group is found oval in 63.3%, round 15%, irregular in 10%, and triangular in 2.5% cases. Irregular shape of placenta in anaemia is found significantly more in comparison with control group. In the present study the mean diameter of placenta in anaemic group is found to be 18.306 (± 2.03) which is significantly higher ($p < 0.05$) than the control group (16.725 ± 1.77).

The thickness of placenta is also found statistically increased i.e. 2.311 cm in anaemic mothers is comparison with control group thickness i.e. 2.075 cm. The number of cotyledons of placenta is found to be statistically decreased in anaemic group (3.24 ± 3.70) comparison to control group (0.075 ± 0.255). Same was observed by Olga et al (1995). This findings also similar with the study of Mongia, Jain, Yadav (2011).

The mean birth weight of baby is found to be 2.638 kg with 0.3312 in normal cases, 2.476 kg with S.D. of 0.455 in anaemic.

Conclusion

Present study reveals that Anemia exerts profound changes on the placental morphology and has effects on mother and birth weight of newborn as growth of fetus is intricately linked with that of placenta, because placenta causes transfer of nutrients as well as oxygen from mother to fetus. Placental abnormalities therefore can be an 'early warning system' for fetal problems. Hypoxia cause morphological changes in placenta like increased weight, diameter & thickening of placentas. Placenta is a focus of increasing interest because significant pathology afflicts the placenta, often before affecting the fetus. Placental abnormalities therefore can be an 'early warning system' for fetal problems. The evaluation of placenta thus becomes essential in high risk pregnancy.

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