



ORIGINAL RESEARCH PAPER

Anatomy

CHANGES IN MORPHOLOGY AND MORPHOMETRIC ANATOMY OF PLACENTA WITH MATERNAL AGE

KEY WORDS:

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ABSTRACT

Placenta is a leading cause of maternal and perinatal mortality and an important factor in foetal growth retardation. Survival and growth of the foetus is essentially dependent on formation, full development and functions of the placenta. It is a mirror which reflects the intrauterine status of the foetus. The careful examination of placenta can give information which can be useful in the management of complications in mother and the newborn.

Material & Method- The study of gross morphology and morphometry of placenta with its clinical significance is conducted in the Department of Anatomy, J.L.N Medical College, Ajmer. The placentae were collected from labour room and gynaecology operation theatre, Rajkiya Mahila Chikitsalya Hospital, Ajmer. A total of 500 cases are studied.

Result- The relationship between the placental thickness and gestational age is linear and direct. Placental thickness (in mm) measurement can be an important additional parameter for estimating gestational age along with other parameters especially from 11 to 35 weeks of gestation. Placental thickness (in mm) increases with increasing gestational age (in weeks) and almost matching it from 11 to 35 weeks of gestation. The relationship of Placental thickness with gestational age falls marginally and the rate of growth of Placental thickness decreased after 36 weeks of gestation and was lower by 1-3 mm.

The thickness of the placenta and growth pattern did not vary relative to the placental location.

Hence in the present study morphometric examination of placenta which includes weight, circumference, volume, diameter, site of umbilical cord insertion is carried out. Placenta is essential for normal foetal development and failure of the placenta can result in foetal problems. Because of growing evidence for a correlation of placental weight and other placental parameters with chronic disease in later life, we suggest attention and correct examination of placenta at the time of birth and recording all of the observation in parents files as an important evidence for future. With evaluation and follow up of placenta growth in early pregnancy, we can prevent the risk for foetal life and improve infant health.

Summary & Conclusion- It is a remarkable matter that the placenta has got both anatomical and functional components from both the maternal and the fetal sources and shows tremendous functional interdependence between those two components. Any anatomical variation or pathophysiological change in the maternal part may influence the foetal part and thereby may complicate the foetal wellbeing. Therefore, postnatal examination of the placenta can be an important method for assessing maternal and foetal condition in antenatal and perinatal periods.

INTRODUCTION-

The assessment of placenta thus becomes essential in high-risk pregnancy as most of the perinatal fetal deaths were related to insufficient oxygen supply in utero. Placenta plays an essential role in transport of oxygen to the fetus and essential for healthy fetal outcome. Therefore, study of placenta is a valuable tool in predicting the outcome of future pregnancies and their management.

Because of the fact that placenta has a normally unrealized potential for incremental growth^{1,2,3,4,5}. Certain pathophysiological conditions such as high altitude, severe anaemia and maternal heart failure are associated with unusually large placental volume.

Placenta extrachorialis, the commonest developmental variant of the placenta is found in 25% of all placentas. Circumvallate form of placenta extrachorialis, whether partial or complete, is associated with an increased incidence of low birth weight^{6,7,8} congenital malformation⁹ prematurity, prenatal bleeding and abruption¹⁰.

The normal placenta can contain 8-20 cotyledons¹¹. Reduced number of cotyledons can be seen in maternal malnutrition, especially in severe anaemia¹². Calcification of placenta is a sign of physiological maturity of placenta. More mature and heavy the placenta more is the extent of calcified patches. Placental calcification occurs earlier in pregnancy in cigarette smokers.

MATERIAL & METHOD-

The study is carried out on 500 full-term freshly delivered placentae that were obtained from all the delivery and

caesarean sections of the Obstetrics and Gynaecology Department. Following measurements of placenta and umbilical cord were inspected.

Placentae were prepared by washing and blotting excess of water.

1. The placenta and umbilical cord is inspected for any abnormality in the shape, cord insertion, and vessels in the cord;
2. Measurements of the placenta are done like weight, circumference, diameter, volume, and thickness at the level of cord insertion.
3. The diameter of the cord is also measured.
4. Volume of the placenta is measured by the water displacement technique.
5. Circumference of the placenta was measured using measuring tape.
6. Maternal age

Mean Thickness Of Placenta

Mean thickness (in cm)	Number of placenta	Percentage
18-20	56	11.20%
20-22	118	23.60%
22-24	112	22.40%
24-26	91	18.20%
26-28	62	12.40%
28-30	37	7.40%
30-32	16	3.20%
32-34	3	0.60%
34-36	5	1.00%
Total	500	

CORD INSERTIONWISE DISTRIBUTION OF PLACENTA

Site	Number	Percentage
Central	465	93.00%
Eccentric	23	4.60%
Marginal	12	2.40%
Total	500	

Statistical Distribution Of Maternal Age

Mean	24.36
Median	24.00
S D	3.39
Range	
Minimum	18.00
Maximum	36.00

DISCUSSION-

Determining the Placental thickness may be helpful in the diagnosis of some abnormalities; a thin placenta may be seen in cases of Intra Uterine Growth Retardation and thick placentas are noted in hydrops fetalis of varied causes. The placenta is the only organ in perinatal life, which can be examined without hazards either to the mother or to the baby. The placenta is a paradox, as it is one of the most readily available organs for examination, yet one of the least studied.

The potential benefits of placental examination include calcification of pathologic features, improved management of subsequent pregnancies by diagnosing pathologic conditions that may have risks of recurrence or may even be preventable or treatable.

Placental thickness (in mm) increases in a linear fashion with advancing gestational age (in weeks) and almost matching it from 11 – 35 weeks of gestation. It can be an additional indicator of estimating gestational age especially where the duration of pregnancy is unknown or uncertain.

Summary & Conclusion-

Placental alterations vary with the nutritional availability that leads to variation in placental weight, altered vascular development, diminished angiogenic growth factor expression, and reduced glucose, amino acid, and lipid transport. Placenta responds to exogenous insults and tries to adapt for varying nutritional level of mother. If this response of placenta fails to maintain foetal growth, then it results in Intra uterine growth retarded babies. Therefore, variations in placental morphometry influence the foetal growth resulting in intrauterine growth retarded babies.

Placenta plays a key role in the development of foetus in the utero but still it receives less attention throughout the pregnancy in contrast to the foetal weight. Though many factors like rays, genetic and health problems of the pregnant women determines the placental and the foetal growth but still the morphometric examination of placenta will give a valuable information about the status of the foetal wellbeing and also helpful in the management of complications in mother and the newborn.

Hence in the present study morphometry examination of placenta which includes weight, circumference, volume, diameter, site of umbilical cord insertion is carried out. Placenta is essential for normal foetal development and failure of the placenta can result in foetal problems.

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