ORIGINAL RESEARCH PAPER

Anatomy

KEY WORDS:
IUGR- Intrauterine growth retardation, cm- centimetres, gms-grams, ml- mili litres

MORHPHOMETRY AND MORPHOLOGY OF PLACENTA

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ABSTRACT

Human placenta is a flattened discoidal mass. The placenta is essential for the survival of the fetus. It undergoes different changes in weight, volume, structure, shape and function continuously throughout the gestation to support the prenatal life. The placenta enables the transport of oxygen, water, electrolytes, nutrition from maternal to foetal blood. Placenta also provides for excretion of carbon dioxide, urea and other waste products produced by the foetus into the maternal blood. **Material & Method**- The study of gross morphology 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**- It was observed that the relationship of Placental thickness with gestational age falls marginally and the rate of growth of Placental thickness decreased after 36 weeks of gestation. **Summary & Conclusion**- Placenta is a specialized structure as part of it is made from mother and other part from the fetus. The placenta is an important structure which connects the fetus with the wall of the uterus. This helps for transportation of the nutrients and other substances. The current study is undertaken to analyse the morphology and morphometric measurements of placenta. The placental examination provides better understanding of the prenatal health of both the child and the mother.

INTRODUCTION-

The outline of placenta is circular or oval with an average weight of about 500 grams and average diameter of about 18 cm. It has two surfaces, the maternal decidua basalis, which appears as rough, reddish, and is subdivided by grooves into irregular areas known as cotyledons, and the fetal part (chorionic frondosum) which is smooth and covered by amnion having the umbilical cord attached near to its centre.

In the first trimester, growth of the placenta is more rapid than of the foetus, but by 17 weeks, placental and foetal weights are approximately equal. It occupies 30% of uterine wall. At term the placental weight is approximately 1/6th of the foetal weight.

At full term placenta presents following measurements
Diameter: 15 to 20 cm

Thickness: 3 cm (at the centre)

Weight: 500 gms

Proportional weight between placenta and foetus at various stages of pregnancy:
1st month: placenta: foetus = 6:1

4th month: placenta: foetus = 1:1

At birth: placenta: foetus = 1:7

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.

RESULT

Table 1-WEIGHTWISE DISTRIBUTION OF PLACENTA

Weight in grams	Number of placenta
400-425	1
426-450	0
451-475	4
476-500	20
501-525	456
526-550	19
Total	**500**

Table 2-Volume Wise Distribution Of Placenta

Volume (in ml)	Number of placenta
300-350	21
351-400	105
401-450	284
451-500	78
501-550	12
Total	**500**

Table 3-cord Insertion Wise Distribution Of Placenta

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

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.

DISCUSSION-

Determining the Placental thickness may be helpful in the diagnosis of some abnormalities; a thin placenta may be seen in cases of IUGR and thick placentas are noted in hydrops fetalis of varied causes.

Table 1 shows weight wise distribution of placenta is shown, the weight of 456 placentae is in between 501-525 grams and 476-500 grams approximately of 20 placentae. Beischer N.A. conducted a study in 1970 on 2485 placenta, the mean placental weight was 553 grams. Sivasamboo R. also conducted a study in 1970 on 1016 placenta and the mean placental weight was 517 gms. Vohra S conducted a study on 302 placenta in 1970 and the mean placental weight was 476 grams.

Table 2 shows volume wise distribution of placenta, the volume of around 284 placenta is 401-450 ml and 12 placenta are of 501-550 ml placental volume. In the study by Rupa L Balihallimath et al., the mean placental volume was 366.08±1.10ml, with a significant positive correlation between the weight of the baby and the placental volume.

Table 3 shows the cord insertion wise distribution of placenta, 465 placenta out of 500 has the central insertion of umbilical cord of placenta and only 12 placenta has marginal insertion of umbilical cord and the percentage is 2.40. A study conducted by Senapati et al. 2015 on 103 placenta maximum number of placenta. 81 (78.6%) showed central cord insertion while 22 placenta showed marginal insertion (21.4%) similar to the present study. Londhe and Mane et.al 2011 found that in 93% of cases there was central attachment of cord while the remaining 7% has marginal attachment.

SUMMARY & CONCLUSION

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 morphometry 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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