



Radiodiagnosis

A PROSPECTIVE STUDY ON PLACENTAL THICKNESS IN RESPECT OF GESTATIONAL AGE ON THE BASIS OF SONOGRAPHY

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ABSTRACT **Background:** Placental size reflects the health and size of the fetus. At about the fifth week of gestation, the placenta develops from the chorionic villi at the implantation site and by tenth week, it is clearly visible at sonography as diffuse granular echo texture. This study was aimed at estimating the placental thickness and investigating the relationship between placental thickness and the foetal growth parameters in normal singleton pregnancies

Methods: 250 total pregnant women were included in this study. The duration of study was over a period of eleven month. This study was conducted in Department of Radiodiagnosis, Military Hospital Deolali Cantt Nashik, Maharashtra from march 2009 to Jan 2010

Results: Out of 250 antenatal studies, most common placental location was anterior wall, and posterior wall location & lateral location comparatively rarely were seen. In this study observed that placental thickness increase per week of gestation age.

Conclusions: This study concludes that, sonographic measurement of placental thickness in singleton pregnancies can be used as an additional tool in the assessment of gestational age due to its linear correlation with gestational age.

KEYWORDS :

INTRODUCTION

Accurate assessment of gestational age is extremely important for assessing the growth of fetus accurately and to plan for delivery. Placenta provides nourishment and support to the developing fetus as well as it correlates with health and growth status of fetus. The changes in the placenta during seventeenth to twentieth weeks has been reported to be the most helpful for assessing the development of the fetus as well as any abnormality if present.^[1,2,3,4] Now a days, various sonographical techniques are used to date the pregnancy.^[5] A new additional parameter to estimate gestational age is measuring placental thickness with the help of obstetric sonography, the accurate determination of gestational age is possible.^[6]

Generally, a normal pregnancy happens in good condition at term between 38 and 42 weeks. A normal pregnancy is considered as the delivery of a single baby, with 2.5 kg weight or more and with no maternal complication.^[7] Biochemical test like, evaluation of foetal growth, risk assessment of various foetal anomalies, expanded maternal serum biomarkers, gestational age also plays an important role. These test results help the obstetrician to take

appropriate measures that would optimize outcome of fetus.^[8] There are substantial antenatal implications of using ultrasonography. It offers a safe and non-invasive means for the evaluation of the placenta whose normal and abnormal size, appearance and growth pattern can be delineated. The placenta is a fetal organ. It provides the physiologic link between a pregnant woman and the fetus with crucial metabolic, endocrine and immunologic functions. It is also responsible for nutrition, respiration and excretion for the fetus. It has a key role in protecting the fetus from toxic agents.^[9] Placental size reflects the health and size of the fetus. At about the fifth week of gestation, the placenta develops from the chorionic villi at the implantation site and by the ninth or tenth week, it is clearly visible at sonography as diffuse granular echo texture.^[10-11]

METHODS

Study Population:

250 total antenatal cases were included in this study, The pregnancies were 11 to 40 weeks and they were not complicated by either maternal or foetal diseases. The Biparietal Diameter (BPD), The abdominal circumference (AC), Femoral length (FL) and Head circumference (HC) and placental thickness were measured by USG by using 3.5 MHZ transducer.

Study Duration: The duration of study was over a period of Eleven month.

Study Area: This study was conducted in Department of Radiodiagnosis, Military Hospital Deolali Cantt Nashik Maharashtra. during the period Mar 2009 to Jan 2010, The patients were dependent wives of authorized Army Personnel.

Data Collection:

The transabdominal sonography was done for each subject. Placental thickness was evaluated from the echogenic chorionic plate to placental myometrial interphase. All these measurements are done when uterine myometrium is in relaxed phase. Sonologically, site of umbilical cord insertion was identified as a 'V' shaped hypo echoic area close to the chorionic plate, where placental thickness was maximum. Calculation of gestational age in 1st trimester was done by measuring CRL (crown-rump length) using had lock table and for 2nd & 3rd trimesters composite of fetal measurements like bi-parietal diameter, circumference of head and abdomen taken at appropriate levels and femur length are used.

RESULTS

250 total numbers of antenatal cases were included in this study. 73% prevalence were found in 20-25 age group followed by 14% in 26-30 age group, 8% in <20 age group & 5% in >30 age group. Out of 250 antenatal studies, most common placental location was anterior wall, followed by posterior wall location & lateral location comparatively rarely were seen. In this study observed that placental thickness increase per week of gestation age which has been shown in chart no. 1. The maximum mean Placental Thickness in the 1st, 2nd, 3rd and the combined trimester were 16.5mm, 23.78mm, 35.81mm and 28.49mm respectively

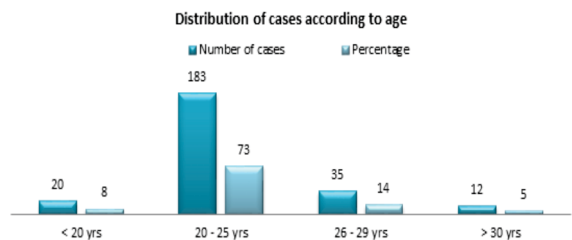


Chart 1: This Chart Showing Age Wise Distribution Of Cases

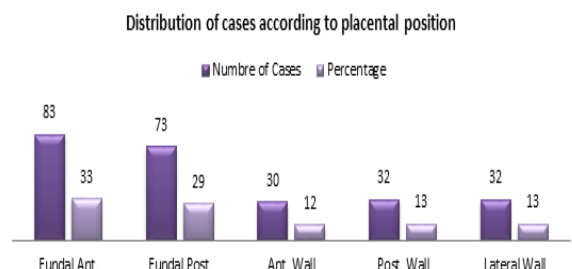


Chart 2: This chart showing Distribution of cases in respect to the placental position

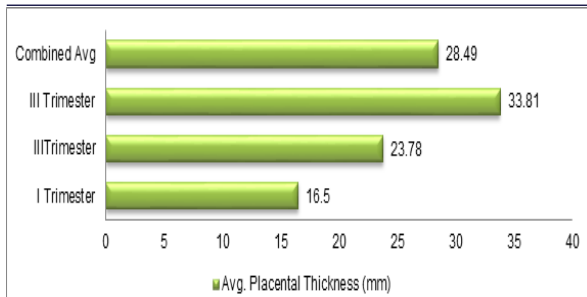


Chart 3: This chart showing Avg. placental thickness in respect to gestational age

DISCUSSION

Previously placenta was assessed to determine its position or to know any premature separation is present or not. Due to this its role in management of pregnancy was limited. Recently, the advancement in ultrasound equipment has led to the understanding of possible morphological changes as the placenta matures from first trimester itself. Changes in placental thickness indicate the normal growth of fetoplacental unit. It can be measurable on sonography. Changed placental thickness has been related with fetal and maternal pathological conditions. Thus, measurement of placental thickness has an important role for examination of pregnancy related complications. Placental thickness must be measured each week of gestation, so that abnormalities of fetus can be detected by calculating the placental thickness.^[12] The recognition of posteriorly located placentas is done by acquiring images, where fetal accosting shadowing is least and for anteriorly placed placentas right positioning of transducer and proper adjustment of gain settings will decrease the near field and reverberation artifacts. Error rate can be minimized by taking accurate measurements. Accurate placental measurements depend on detailed acquisition and interpretation of images. For reducing the measurement errors, all the examinations were performed by using the same equipment and by the same examiner.

It is evident from the present study that sonographic measurement of placental thickness in singleton pregnancies can be used as an additional tool in the assessment of gestational age due to its linear correlation with gestational age. An abnormal placental thickness for the respective gestational age should raise the doubt of any underlying pathological process at earlier stages which may affect the pregnancy outcome.

CONCLUSIONS

We conclude that Placental thickness can be used as a predictor of the gestational age. The subnormal placental thickness for the corresponding gestational age should be evaluated for any disease condition. So the measurement of placental thickness should therefore be carried out routinely during the obstetric USGs.

This study concludes that early identification of abnormalities may help the obstetrician to consider precise antenatal care. Hence, regular antenatal ultrasound examinations should include measurement of placental thickness, as it helps in measuring intrauterine environmental adequacy and fetal well-being.

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