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CORRELATION OF SONOGRAPHIC PLACENTAL THICKNESS WITH GESTATIONAL AGE IN NORMAL SINGLETON PREGNANCIES

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Abstract:
Background: *Ultrasound is considered the most effective way to monitor the pregnancy at present. There are many parameters which can help to measure the gestational age of fetus, and the placental thickness is considered one of the new ways to estimate gestational age of the fetus and also help to analyze the growth pattern of the fetus with the increase in the gestational age.*
Objective: *The objective of the study is to analyze the correlation between the gestational age and songraphic placental thickness in the singleton pregnancy.*
Methodology: *The study was conducted in Radiology department of Lahore General Hospital for the period of three months from May 2019 to July 2019. The sample size was 298 pregnant women with singleton pregnancy from 18th week of pregnancy to 40th week of pregnancy. Only healthy women were included in the study that was sure about their last menstrual period date. Women with medical issues and pregnancy issues were excluded from the study. The relationship of placental thickness with gestational age was analyzed.*
Results: *The results showed that the placental thickness mean increases as the gestational age advances. At 18th week of pregnancy the placental thickness mean observed was 18.7 mm and the thickness reached at 30.5 mm when the gestational age was 40th week. The gestational age with the placental age was almost similar from 18th week to 32th week of the pregnancy. After the 32th week the thickness of placenta slightly reduces and almost remains constant till 40th week of the gestational age with an estimated value of 31 mm. The study was conducted by many authors around the globe and in Pakistan also. The findings were almost consistent with other studies that the gestational age is correlated with the placental thickness.*
Conclusion: *From the study it was concluded that the placental thickness is an important factor in measuring the gestational age of the fetus by using ultrasound.*
Key word: *Placental thickness, Last menstrual period, ultrasound, gestational age*

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INTRODUCTION:

The physiological link between the pregnant women and fetus is maintained with the help of placenta and is very important organ for the growth of fetus. Ultrasound is very helpful throughout the pregnancy and helps to identify the growth pattern of fetus and also helps to identify the anomalies and complications of pregnancy. The study aim is to analyze the correlation of placental thickness with gestational age and ultrasound helps to identify the relationship between the two. Placenta is a vital organ which helps to provide the oxygen and nutrition to the fetus and it is also responsible to carry on the excretory function. Ultrasound is widely used in imaging the growth of pregnancy and placenta due to its safe features. The risk of harmful radiation in ultrasound is lacking therefore it is safe technology for detection of congenital malformation during pregnancy. The placenta in ultrasound image can be observed as uniform echogenic structure which is seen along the uterine wall, it is separated from the normal uterine myometrium with a hypoechoic band. Placenta seems like a venous lake having many enechoic areas. In 1965 the placenta was first time identified in ultrasound by the Donald. Placental thickness is a good parameter for identifying the gestational age of the fetus by using the sonograms. Many studies have confirmed that as the gestational age of the fetus increases the placental thickness also increases which shows a linear relation. The purpose of the study is also to measure the thickness of placenta and establish a relationship between the gestational age and the placental thickness. As the gestational age advances the placental thickness also increases.

METHODOLOGY:

The study was conducted in the Radiology Department of Lahore General Hospital for three months period from May 2019 to July 2019. All pregnant women with singleton pregnancy from 18th week of gestational age to 40th week of gestational age were considered who have no complication in pregnancy and no medical issue. Women with history of hypertension, diabetes mellitus, fetal hydrops, IUGR pregnancies, anomalies and multiple pregnancies were excluded from the study. Ultrasounds were performed with full bladder and in supine position. The placental thickness at the site of cord insertion was measured by pushing the plane of transducer in perpendicular position to placental basal and at chorionic plates. Placental thickness was recorded from the echogenic chorionic plates to basal plates and three readings were noted to measure the mean. During measurement retro placental hypoechonic plates were excluded from the measurement. Gestational age was calculated by using the date of last menstrual period. To establish the relationship of placental thickness with gestational age the mean and standard deviation was used a tool to measure the statistical significance which was $P < 0.01$ which is supposed to be satisfactory and significant.

RESULTS AND DISCUSSIONS:

The cross sectional study was conducted for three months in Radiology department of LGH. Total 298 women with singleton pregnancies were included having no medical issue and were from the 18th week of gestational age to 40th week of gestational age with confirmed date of last menstrual period. Placental thickness was calculated at gestational age of the fetus. The mean and standard deviation of the placental thickness is shown in the table 1. It is obvious from the table as the gestational age increases the placental thickness also increases. At the 18th week the mean placental thickness was 18.7 mm and it reached at 30.6 mm at 40th week .The value of standard deviation increased as the advancement in the pregnancy was observed. The Pearson coefficient correlations ($P < 0.005$) shows a linear strong positive relation with placental thickness and gestational age

Table

No of cases	Mean and Standard Deviation	Gestational Age by Last menstrual Period
28	18.7±1.6	18 week
15	19.7±1.8	19 week
19	20.7±2.7	20 week
12	21.7±2.7	21 week
11	23.2±6.0	22 week
16	23.8±2.8	23 week
13	25.1±1.8	24 week
10	25.5±2.8	25 week
12	26.1±3.1	26 week
11	27±2.0	27 week
11	28±3.2	28 week
6	28.5±2.6	29 week

16	29.2±2.6	30 week
16	30.6±3.2	31 week
25	32.1±5.2	32 week
15	30.8±5.6	33 week
16	31.7±2.8	34 week
16	31.2±4.6	35 week
14	33.1±5.2	36 week
8	29.6±4.9	37 week
4	31.5±3.6	38 week
4	30.5±6.8	39 week
4	30.6±6.9	40 week

Placental thickness mean is linearly linked with gestational age in mm from the 18th week of pregnancy to 32th week of pregnancy, after this the slight reduction in mean was observed and it almost remain static until 40th week with 31 mm as an average value .The maximum thickness recorded of the placenta was in 36th week of pregnancy which was 44 mm and the minimum placental thickness was in the 18th week of pregnancy that is 17.4 mm. The mean placental thickness in 36th week was 33.1 mm. Changes in placental thickness is considered a normal growth pattern in the fetus development when measured with the help of ultrasound is considered a normal physiology. Placental thickness measurement helps in identifying the abnormalities of the fetus at early stage. From the table and study it is clear that there exist a positive linear relationship between the gestational age of the fetus and placental thickness.

Different studies conducted by different authors like Granum and Hobbins et al, Mital P, Hooja N, Mehndiratta K.et al, Anupama jain, Ganesh Kumar ,U Agarwal, S Kharakwal et al 2016 has also identified the positive correlation between the gestational age and the placental thickness.

CONCLUSION:

Ultrasound has helped to identify the normal growth pattern of pregnancy through placental thickness and gestational age relationship and also it has helped to identify the abnormality in think or thick placenta at any gestational age for better medical solutions. Placental thickness is vital parameter for the growth of the fetus as the thickness enhances the weight and gestational age of the fetus also increases. It is a safe and reliable parameter to identify the growth pattern of fetus.

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