Fetal Assessment In Pregnancy: An Ultrasound Demonstration At Bex Memorial Hospital, Onitsha, Anambra State, Nigeria.

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Abstract

Background: Diagnostic ultrasound is an advanced electronic device that creates images by using high-frequency sound pulses. Medical diagnostic examination can be utilized in a number of particular circumstances during pregnancy such as after health complications, or where there are concerns about fetal development. Since adverse effects can occur in pregnancies with no obvious risk factors, it is assumed that routine ultrasound would benefit all pregnancies by allowing for early detection and better control of pregnancy complications. Physical examination may be scheduled for early in the pregnancy, late in the pregnancy, or both.

Aim: When opposed to the limited use of early pregnancy ultrasound for fetal assessment, researchers wanted to see how regular early pregnancy ultrasound for fetal assessment affects the detection of fetal malformations, multiple births, the rate of clinical procedures, and the occurrence of adverse fetal outcome. bex memorial hospital, onitsha, anambra state, nigeria, was the site of this study.

Inclusion Criteria: Only pregnant women who visited the ultrasound unit during the research time were included in the study and only pregnant women who have a thorough record of their socio-demographic characteristics and diagnosis were considered.

Data collection and analysis: The required information was gathered using a well-structured data collection sheet and statistical Package for Social Sciences was used to analyze the results (SPSS version 25.0). The findings were presented in a frequency distribution table and a cross-tabulation. At a 95% confidence level, the Chi-square test was used to look for substantial differences, and a P-value of less than 0.05 (P0.05) was considered statistically significant.

Results: The foetuses in the anterior position accounted for 60.3 percent, the posterior position for 20.0 percent, and the fundal position for 19.7%. Breech position accounted for 23.9 percent of the placenta, while oblique position accounted for 18.4 percent. The placenta in the Occipito-Anterior position has a higher percentage of 57.7%. There were 1.4 percent (8/579 pregnancies, all breech presentations) noncephalic foetuses in postal cases, compared to 8.9 percent (29/327 pregnancies, 7.9 percent split and 1.0 percent transverse) in lateral cases, 6.2 percent (5/81 females, both presentations) in fundal cases, and 7.2 percent (5/69) in lateral insertions. With a 20.15 cm pelvic circumference, a 17.51 cm head circumference, and a gestational age of 20.24 weeks, the average femur duration was 9.89 cm. On the other side, the foetus seemed to be perfectly fine.

Conclusions: The current scrutiny corroborated the size and growth of the foetuses observed via ultrasonography; by assessing fetal body parameters such as femur length, head circumference, abdominal circumference, placenta position, and fetal presentation.

Keywords: Fetal assessment, ultrasound, pregnancy, pre-term birth.

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Introduction

Pre-term birth, small gestational age (SGA), fetal abnormality, pre-eclampsia, and mal-presentation are all linked to placental location, according to several reports. (1, 4, 16, 19, 22). Ultrasound scan, also called sonography, is a diagnostic test that uses high-frequency sound waves to capture live images from inside the body (5- 7). Ultrasound pulses are emitted by a transducer that is passed through the region to be tested and propagate through the tissues (3). Some pulses are returned to the transducer, which transforms the echoes into electronic signals (34). Since negative outcomes can occur in pregnancies with no obvious risk factors, it's been assumed that using ultrasound in all pregnancies would be advantageous (4). The first fetal ultrasound is normally done in the first trimester to validate and predict the results of the pregnancy (2, 27). If the pregnancy is still clear, the next ultrasound is normally done in the second half of the pregnancy, when more anatomical information is visible (2). Deferred labor, non-cephalic introduction, single or multiple pregnancy, incomplete premature delivery, molar pregnancy, ectopic pregnancy, fetal divergence from the standard, placenta previa, and intrauterine restriction development have all been investigated using ultrasound. (20), appraisal of the pelvic outlet and estimate of the gestational era (21). The size and development of the fetus can be verified by measuring fetal body parameters such as placenta position, fetal growth, and fetal presentation. (2, 8) and would make a significant contribution to the diagnosis of intrauterine growth retardation in late pregnancy (37), a benefit

to gynecologists, doctors, and researchers, as well as the women's understanding of the benefits of ultrasound.

Objective

Numerous studies on fetal assessment during pregnancy have been conducted in various health institutions; however, few studies, especially on the potential impacts on fetal assessment of pregnancy outcomes, have been conducted, and no published study on fetal assessment in pregnancy using ultrasound demonstration at Bex Memorial Hospital, Onitsha, has been conducted.

Materials and Methods

Types of Study

For this study, a prospective study design was used.

Study Area

Bex Memorial Hospital is located in Onitsha, Anambra State. The facility serves as a medical outreach in Eastern Nigeria that provides trusted healthcare and establishes modern guidelines in high-quality healthcare with a commitment to excellent service, quality patient-friendly approaches, and advanced means with a cost-effective approach to the health of the general public.

Study Population

All pregnant women who volunteered to have an ultrasound scan at Bex Hospital in Onitsha, Anambra State, between June 2020 and January 2021.

Sample and Sampling Technique

This included those who went to the radiology department's ultrasound unit during the study period. Purposive sampling was used as the sampling method.

Types of participants

Women with early pregnancies less than 24 weeks' gestation.

Inclusion Criteria

1. Only pregnant women who visited the ultrasound unit during the research time were included in the study.

2. Only pregnant women who have a thorough record of their socio-demographic characteristics and diagnosis were considered.

Types of interventions

The results of a routine ultrasound test versus a limited ultrasound examination were compared.

Data Collection

The required information was gathered using a well-structured data collection sheet that included:

1. The age of the subject

2. Race and ethnicity

3. Age at conception

4. The location of the placenta

5. Development of the fetus

6. Presentation of the fetus

Types of outcome measures Primary outcomes

1. Distribution of subject's age in the studied population.

2. Fetal position distribution in the studied population

3. Placental position distribution in the studied population.

4. Descriptive statistics of the fetal variables in the studied population

5. Correlation between observed fetal variables.

6. Regression between observed fetal variables against gestation age

7. Chi-square test of association between Maternal Age and Fetal position in the studied population.

8. Chi-square test of association between Maternal Age and Placental position in the studied population

Secondary outcomes

Detection of

1. Femur Length (cm) of fetus

2. Fetus abdominal circumference (cm)

3. Fetus head circumference (cm)

4. Gestational Age (weeks)

Data Analysis

The Statistical Package for Social Sciences was used to analyze the results (SPSS version 25.0). The findings were presented in the form of a frequency distribution table and a cross-tabulation.

At a 95% confidence level, the Chi-square test was used to look for substantial differences, and a P-value of less than 0.05 (P0.05) was considered statistically significant.

Ethical Consideration

The Research and Ethics Committee of Anatomy Department of the Faculty of Basic Medical Sciences, Delta State University, Abraka, Nigeria, checked and approved the protocol for this study, and permission was also sought from the management of Bex Memorial Hospital before the study began.

Results

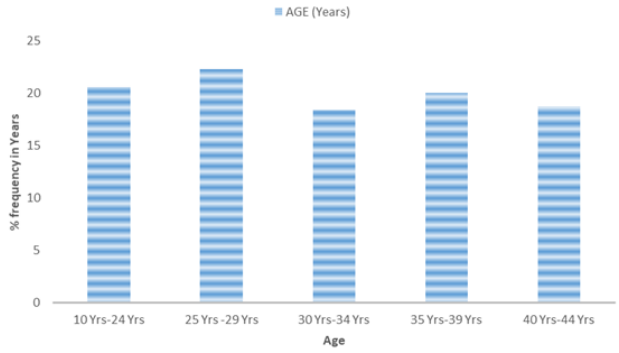

Figure 1. *Distribution of Pregnant Mother's Age in the studied population.*

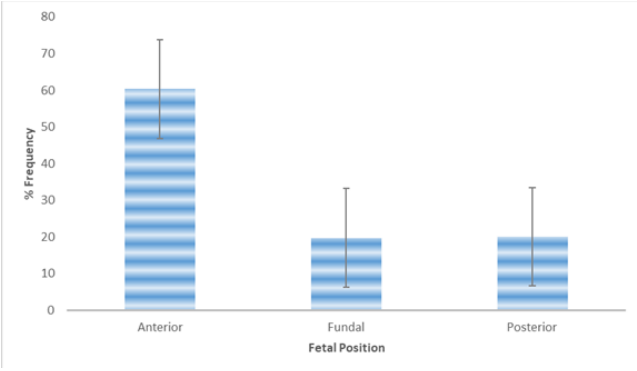

Figure 2. *Fetal position distribution in the studied population.*

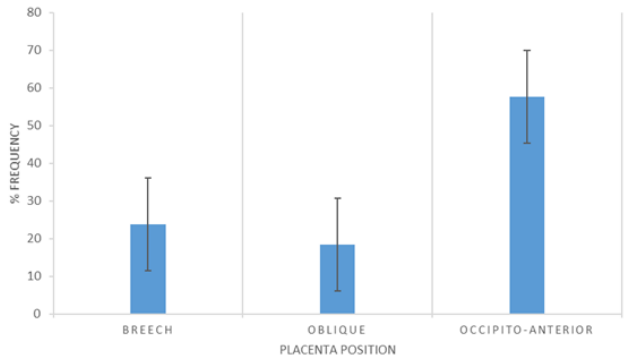

Figure 3. *Placental position distribution in the studied population.*

Table 1. *Descriptive statistics of the fetal variables in the studied population.*

Fetal Variables	Minimum (cm)	Maximum (cm)	Mean (cm)	Standard deviation
Femur Length (cm)	2	15	8.68	4.096
Abdominal Circumference (cm)	10	29	20.15	5.800
Head Circumference (cm)	10	25	17.51	4.633
Gestational Age (weeks)	10	30	20.24	5.909

Table 2. *Correlation between observed fetal variables.*

		Femur Length (CM)	Abdominal Circumference (CM)	Head Circumference (CM)
Femur Length (CM)	Pearson Correlation	1	.995**	.993**
	Sig. (2-tailed)		.001	.001
	N	310	310	310
Abdominal Circumference (CM)	Pearson Correlation	.995**	1	.993**
	Sig. (2-tailed)	.001		.001
	N	310	310	310
Head Circumference (CM)	Pearson Correlation	.993**	.993**	1
	Sig. (2-tailed)	.001	.001	
	N	310	310	310
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 3. *Regression between observed fetal variables against gestation age Regression Equation.*

Femur length (cm)	-5.287 + 0.690	Gestational Age (weeks)
Abdominal Circumference (cm)	= 0.364 + 0.978	
Head Circumference (cm)	=1.754 + 0.778	
Gestational Age (weeks)	= 7.782 + 1.436	Femur Length (cm)
Gestational Age (weeks)	= -0.206+ 1.015	Abdominal Circumference (cm)
Gestational Age (weeks)	= -1.925+ 1.266	Head Circumference (cm)

Table 4. *Chi-square test of association between Maternal Age and Fetal position in the studied population.*

Age (years)	Anterior Position	Fundal Position	Posterior Position	Chi-square	Df	P-value
20-24	41 (13.2)	11 (3.5)	12 (3.9)	5.127	8	0.744
25-29	45 (14.5)	9 (2.9)	15 (4.6)			
30-34	34 (11.0)	12 (3.9)	11 (3.5)			
35-39	35 (11.3)	13 (4.2)	14 (4.5)			
40-44	32 (10.3)	16 (5.2)	10 (3.2)			
Total	187 (60.3)	61 (19.7)	62 (20.0)			

Table 5. *Chi-square test of association between Maternal Age and Placental position in the studied population.*

Age (years)	Breech position	Oblique position	Occipito -Anterior position	Chi-square	df	P-value
20-24	17 (5.5)	12 (3.9)	35 (11.3)	2.243	8	0.973
25-29	17 (5.5)	11 (3.5)	41 (13.2)			
30-34	15 (4.8)	10 (3.2)	32 (10.3)			
35-39	15 (4.8)	12 (3.9)	35 (11.3)			
40-44	10 (3.2)	12 (3.9)	36 (11.6)			
Total	74 (23.9)	57 (18.4)	179 (57.7)			

Discussion

Ultrasound for fetal examination in early pregnancy raises the likelihood of detecting multiple pregnancy before 24 weeks of pregnancy (11, 35), and evidence shows that fetal anomalies are identified earlier with ultrasound (35).Routine scan is linked to fewer inductions of labor for “post-term” pregnancies (36), which leads to a modest reduction in overall induction rates (14). Routine scans do not seem to be linked to less adverse effects for babies or reduced health-care use by mothers and babies. Long-term follow-up of children subjected to scans in utero, on the other hand, does not suggest that scans have a negative impact on children's physical or cognitive growth (9, 30). As a result, the advantages of routine ultrasonography in early pregnancy include improved gestational age estimation, faster identification of multiple pregnancies, and detection of clinically unsuspected fetal malformation at a time when the pregnancy can be terminated (7; 25). The fetal and placenta positions distribution at Bex Memorial Hospital, Onitsha, Anambra State, Nigeria, as shown in figures 2 and 3, with the fetal anterior position accounting for 60.3 percent, the posterior 20.0 percent, and the fundal position 19.7 percent of the fetuses. As compared to the Breech position 23.9 percent and the Oblique position 18.4 percent of the placenta, the Occipito-Anterior position of the placenta has a higher percentage of 57.7%. This report is similar to the findings of Ezeobi et al. (10) who used six different types of abnormal birth positions to detect the most common birth defects, delivery modes, and related birth complications. They found a 70.00 percent breech (most common fetal irregular position), 14.73 percent transverse, 8.45 percent occiput posterior, 3.27 percent face appearance, 1.91 percent shoulder, and 1.00 percent shoulder. Zia (38) was also able to pinpoint the position of the placenta. Women's medical histories and placental locations were re-evaluated retrospectively based on the standard antenatal ultrasound notes (20–38 weeks). There are three types of placental positions: recent, post-, and fundal. There were 500 vaginally treated cases in this group. Fundamental positions were found in 46 percent of women, previous positions in 28 percent, and subsequent positions in 26 percent. The preliminary placenta has been linked to a higher risk of hypertension, gestational diabetes mellitus, and placental abruption (p0.001), while the subsequent placenta has been linked to a major preterm labor association (p0.001). The findings of this research also corroborate those of Salvatore et al. (23), who found a mean gestational age of 38.7 1.3 weeks based on a sonographical analysis of the position of the placenta. The differences between the anterior and non-anterior insertions were statistically relevant ($P<0.05$) in data from the placental (PL) and fetal presentation (FP) sites of birth associations. In postal instances, however, there were 1.4 percent (8/579 pregnancies, both presentations of breech) noncephalic fetuses, compared to 8.9 percent (29/327 pregnancies, 7.9 percent split and 1.0 percent transverse) in lateral cases, and 6.2 percent (5/81 females, both presentations) in fundal cases. and 7.2% (5/69) of lateral insertions. However, given the high levels of heterogeneity in our observations, caution should be exercised. Table 1 shows that the femur length was 9.89 cm on average, the abdominal circumference was 20.15 cm, the head circumference was 17.51 cm, and the gestational age was 20.24 weeks. The fetus, on the other hand, showed no major anomalies. Standard femur lengths of 9.90 cm have been recorded by Hadlock et al. (17), which may change between ethnic groups. Table 2-5 of this study shows the correlation between observed fetal variables and gestation age, Maternal Age and Fetal Position, and Maternal Age and Placental Position. The diverse studies discoursed above demonstrated exclusivity owed to influences such as ethnic, age, and methodology.

Conclusion

The current scrutiny corroborated the size and growth of the fetuses observed via ultrasonography; by assessing fetal body parameters such as femur length, head circumference, abdominal circumference, placenta position, and fetal presentation.

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