Original Article

Assessment of Common Placental Locations After 35 Weeks Gestation Using Ultrasound Findings: A One-Year Retrospective Study at Irrua Specialist Teaching Hospital (ISTH), Irrua, Nigeria

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ABSTRACT

Nigeria's over 40 million women of childbearing age suffer a disproportionally high level of health issues surrounding birth and currently contributes up to 10 per cent of global deaths for pregnant mothers. Child delivery conducted without proper knowledge of the placental position and adequate management techniques could result in severe bleeding and other complications before, during and after deliveries, which is a major cause of maternal mortality. Ultrasonographic (US) examination of the placenta during pregnancy is vital because it helps to ascertain the location of the placenta and any other identifiable abnormalities therein. The aim of this study was to identify the common placental positioning in pregnant women of greater than 35 weeks gestation. The study was a retrospective, non-experimental one which obtained data from the obstetric US Scan (USS) of female antenatal patients whose pregnancies were of greater than 35 weeks gestation and attended antenatal clinics at the Irrua Specialist Teaching Hospital (ISTH), Irrua from January 1 to December 31, 2021. The outcome showed that out of the 111 pregnant women, most were between ages 25 and 35 years old and their gestational ages were 36weeks+6days and 37weeks+2days accounted for the majority. As regards placental location, it was observed that all categories of placental positions were observed in this study except the low-lying. Furthermore, anterior and fundal placental positions were most predominant, accounting for over 80 % of the cases. In conclusion, it is encouraged that in all pregnancies, the Physician pays attention to placental location to enable the healthcare providers to prepare for possible complications that can arise from placenta positioning as this can help reduce maternal and neonatal mortality or morbidity.

Keywords: Placenta, Pregnancy, Ultrasound Scan

INTRODUCTION

Nigeria's 40 million women of childbearing age (between 15 and 49 years of age) suffer a disproportionally high level of health issues surrounding birth[1-3]. While Nigeria represents 2.4 percent of the world's population, it currently contributes 10 percent of global deaths for pregnant mothers[4,5]. The latest figures show a maternal mortality rate of 576 per 100,000 live births, the fourth highest in the world with approximately 262,000 babies dying at birth, the world's second-highest national total [5].

The placenta is a foeto-maternal organ that provides a unique connection between mother and baby. It is only present during pregnancy and functions in multiple ways, such as providing nutrition and oxygen needed by the embryo, excreting waste products, and helping to provide reliable protection

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against extraneous factors [6,7,8]. It produces hormones that help baby growth and passes immunity from mother to baby [9]. The placenta may be situated in different positions within the uterus as the placenta develops wherever the fertilized egg embeds itself in the uterus[10, 11]. Some of the locations of the placenta include posterior, anterior, fundal, lateral, and low-lying [11]. Changes in placenta position i.e. upward movement of the placenta away from the cervix as pregnancy advances may occur because of uterine enlargement during pregnancy up until about 32 weeks of pregnancy [9]. However, the placental position at 36 weeks would likely remain unchanged till childbirth [12].

The placental location has been implicated in preterm birth, foetal malposition and malpresentation, small for gestational age, low APGAR (Appearance/Pulse/Grimace/Activity/Respiration) score and development of preeclampsia [10,13,14].

Placenta previa, a condition where the placenta lies in the lower uterine segment and partially or completely obstructs the internal cervical os, is clinically challenging. It complicates approximately 1 in 200 deliveries and is one of the leading causes of vaginal bleeding in the second and third trimesters [15, 16]. The placental location has also been implicated in foetal malposition and malpresentation, low APGAR score, development of preeclampsia and poor perinatal outcomes [13, 17]. Other studies have found an increased incidence of Intrauterine Growth Restriction (IUGR) in pregnancies with low-lying placentas [18,19,20]. Increased foetal distress, IUGR, pre-eclampsia, and caesarean deliveries are more common in women with unilateral placentas compared with centrally implanted placentas [13]. Warland *et al.* [21], reported that the risk of stillbirth in the posterior placenta was significantly high. A significant association has been established between the posterior placenta and preterm labour and stillbirth [22].

The site of implantation that decides the location of the placenta is an important determinant of placental blood flow and therefore pregnancy outcome [13, 14]. Assessment of placental location allows for timely identification of at-risk pregnancies to ensure close monitoring in order to minimize maternal and neonatal morbidity and mortality [23]. Ultrasound imaging is an integral component of routine pre- and peri-natal care for most pregnant women that involves evaluation of the foetus, placenta position, umbilical cord and amniotic fluid [24]. Generally, every pregnant woman is encouraged to undergo at least one obstetric scan for assessment of gestational age, amniotic fluid volume, foetal assessment, and placental location to aid preparation for childbirth.

Ultrasonographic examination of the placenta during pregnancy is a vital aid to pregnancy management as it primarily determines the location of the placenta, and placental blood flow and identifies its abnormalities in the latter weeks of pregnancy [25]. Identifying the location of the placenta will assist in planning and preparation for the management of mother and child thus reducing maternal and neonatal morbidity and mortality [11]. It is therefore of immense importance to identify placental position as well as determine the common types prevalent in our environment. This study is therefore aimed at determining the common sites of placenta location of pregnant mothers after 35 weeks gestation who had obstetrics ultrasound scan at ISTH, Irrua between January and December, 2021 to establish the prevalence of placental location as a means of forecasting the eventual type of birth, complications that may arise during childbirth and neonatal outcome.

MATERIALS AND METHODS

Study design

This was a retrospective study in which the researchers studied existing data of pregnant women who had USS after 35weeks gestation at ISTH, Irrua between January 1 and December 31, 2021, from case notes.

Study area

ISTH is owned and operated by the Federal Government of Nigeria, located in the central senatorial district of Edo state. It is a tertiary hospital that provides specialist healthcare services for residents of Edo and neighbouring states while also serving as the training institution for the students of the Ambrose Alli University, College of Medicine,

Ekpoma, Nigeria [26].

Data collection

Socio-demographic characteristics of presenting women, gravidity and parity of the pregnancy, gestational age as well as the placental location after 35 weeks were extracted from the case notes and USS reports of the patients.

Ethical Considerations

Ethical approval for this research proposal was obtained from the Research and Ethics Committee of ISTH, Irrua, Edo State.

Inclusion criteria and Exclusion criteria

All ante-natal patients at gestational age over 35 weeks who had USS at ISTH, Irrua between January 1 and December 31, 2021, were included in this study. Pregnant patients who showed evidence of placental separation were excluded from this study. A total of 111 patients who met the inclusion criteria were recruited for this study.

RESULTS

The age, ethnicity and religion of the 111 women who presented with pregnancy age greater than 35 weeks and had obstetrics ultrasound scan at ISTH, Irrua from January to December 2021 are presented in Tables 1, 2 and 3.

A notable finding of this study is that the exact age (in years) of 36.90% of female antenatal patients who presented with gestational aged of greater than 35 weeks and had obstetrics ultrasound scan at ISTH, Irrua within the period was not recorded. The age was simply documented as adult or "ad". It is also important to note that females aged 26 to 30 years had the highest frequency of 27 (24.32%) while ages 41 to 45 had the lowest frequencies of 4 (3.6%). Also, an important finding of this study is that majority of the subjects in this study (77.50%) hailed from the Esan ethnic group. From data analysis in this study, it was found that Christianity was the predominant religion practised by subjects in this study (93.69%) while Muslims formed the minority group with a frequency of 7 (6.31%).

The gestational age distribution of the study participants is presented in Fig 1. Findings from this study revealed that gestational ages of 36 weeks 6 days (36wks. 6) and 37 weeks 2 days (37wks. 2) had the highest frequency of 8 (7.2%) each. The highest gestational age recorded in this study was 39 weeks and 6 days (39wks. 6) with a frequency of 2 (1.8%).

The placental location distribution of the 111 subjects is as presented in Table 5. Findings of this study showed that in the majority of the subjects (37.8%), the placenta is located anteriorly. Lateral placenta location was the least observed in this study with a frequency of 1 (0.9%).

Table 1: Age of women presenting at antenatal clinic with gestation age greater than 35 weeks.

Age	Frequency	Percent
21 – 25	10	9.01
26 – 30	27	24.32
31 – 35	19	17.12
36 – 40	10	9.01
41 – 45	4	3.60
AD	41	36.94
Total	**111**	**100.0**

Table 2: Ethnicities of females presenting at antenatal clinic with gestation age more than 35 weeks

Ethnic Group	Frequency	Percent
Akoko-Edo	2	1.8
Auchi	1	0.9
Bini	7	6.3
Calabar	1	0.9
Esan	86	77.5
Hausa	4	3.6
Igbo	6	5.4
Yoruba	4	3.6
Total	**111**	**100.0**

Table 3: Religion of females presenting at antenatal clinic with gestation age more than 35 weeks.

Religion	Frequency	Percent
Christian	104	93.7
Islam	7	6.3
Total	**112**	**100.0**

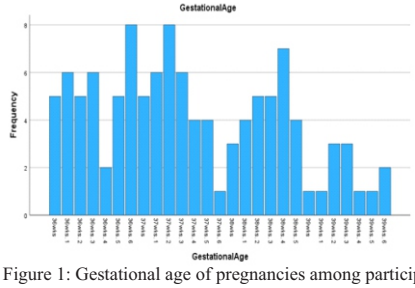

Figure 1: Gestational age of pregnancies among participants

Table 4: Placental location in pregnancies

Placental location	Frequency	Percent
Anterior	42	37.8
Antero-fundal	17	15.3
Fundal	6	5.4
Inferolateral	2	1.8
Lateral	1	0.9
Posterior	23	20.7
Postero-fundal	20	18.0
Total	**111**	**100.0**

DISCUSSION

The anteriorly sited placenta accounted for the greater majority (37.8%) of the cases analysed while lateral location was the least (0.9%). It is notable that in this study there was no record of a low-lying placenta. Findings from this study on placental positions agree with those of several researchers including Zia [10], who identified possible placental positions as fundal **(**top of the uterus**),** anterior (front wall), posterior (back wall), lateral (side walls - left or right) or placenta previa i.e. covering the cervix. In line with this classification, the researchers have summed up postero-fundal, antero-fundal and fundal placenta positions and will refer to them generally as fundal position with an overall frequency of 43 (38.7%) as well as inferolateral and lateral position and will refer to them generally as lateral with an overall frequency of 3 (2.7%). The finding of this study agrees with Torricelli *et al.*, [27], who found the predominant placental location to be anterior and fundal. This location also has the advantage of being associated with less obstetric co-morbidities [28]. The posterior placenta often considered the most favourable for the baby, facilitates optimal growth and alignment in the birth canal for a vaginal birth with the baby facing the mother's spine and the crown descending over time.[29] This positioning was observed in a significant number of cases (20.7%). However, a posterior placenta has equally been implicated in the likelihood of still birth or pre-term labour occurrence [10, 21]. Research has also shown a statistically significant association of anterior placental positioning, with an increased incidence of pregnancy-induced hypertension (PIH), gestational diabetes mellitus (GDM), bad obstetric history (BOH), placental abruption, intrauterine growth retardation (IUGR) and intrauterine fetal death (IUFD) [13]. Lateral placentae are known to be associated with IUGR and/or pre-eclampsia [10]. Noteworthy, is that all pregnancies, whether with anterior, posterior, fundal or lateral placental positioning, can be complicated by PIH, Gestational Diabetes Mellitus (GDM), placental abruption, IUGR, and IUFD, depending on other confounding variables. Therefore, the physician needs to look closely at the placental location and be on a watch out for the complications that may arise on account of placental location and the effects on the lives of the mother and child. This is because, emergency preparedness to solve these problems with easily accessible equipment and personnel to handle any eventualities is an important determinant of pregnancy outcome [10].

The placenta is a foeto-maternal organ that provides a unique connection between the mother and the unborn child. It is only present during pregnancy, a period when it plays a protective role throughout the pregnancy period.[8] The placental location has been implicated in fetal malposition and malpresentation, low APGAR score, development of preeclampsia, and perinatal outcome in the area of measures like the length of gestation [13, 17], Intrauterine Growth Restriction (IUGR), pre-eclampsia and caesarean deliveries [13]. Ultrasound imaging is an integral component of routine antenatal care for most pregnant women, it involves evaluation of the foetus, placenta, umbilical cord, and amniotic fluid. Assessment of placental location allows for timely identification of at-risk pregnancies to ensure close monitoring in order to minimize maternal and neonatal morbidity and mortality [23].

This study was a retrospective non-experimental design carried out to identify the common placental positioning, using data collected from the obstetric USS reports of female antenatal patients with pregnancies of gestational age greater than 35 weeks, who attended antenatal clinics in ISTH, Irrua during the period under review. The knowledge of placental location during their antenatal care periods, will help in forecasting and preparing for

the eventual type of birth, complications that may arise during childbirth and neonatal outcome [7].

The socio-demographic characteristics i.e., age, ethnicity and religion of the 111 pregnant subjects who had ultrasound scan (USS) to determine placenta location at gestational age greater than 35 weeks at ISTH, Irrua within the period under review was evaluated in this study. The analyses showed that the ages of only 70 female subjects (63.10% of the study population) were recorded, the ages of the remaining 41 patients (36.90%) were simply recorded as adults or "ad". This is a major limitation to this study as it can hamper the process of making a reliable inference from the data. The 70 pregnant women whose ages were recorded in this study ranged between 21 and 43 years. Subjects aged 27 and 28 years were the most predominant in the population. On the other hand, subjects aged 21, 38, 40, 42 and 43 had the lowest frequencies. Age group 21 – 29 years accounted for 28.83% of the population and age group 30 – 39 years accounted for 29.73%, indicating that majority of the population were aged between 21 and 39 years. It is thus observed that from the data available on recorded ages in this study, majority of the mothers were aged within their twenties and thirties with a major decline in the early forties; a finding that is possibly because the reproductive abilities of the woman peaks at late teenage years and by age 30, fertility (the ability to get pregnant) begins to decline [30-32]. Fewer than 5% of women are expected to be successful with pregnancy each month and most women become unable to have a successful pregnancy in their mid-40s, Furthermore, women 40 years and above have higher risk of pregnancy complications such as high blood pressure, preeclampsia, and gestational diabetes [33, 34]. This reduces the chances of women who are pregnant at greater than 40 years carrying the pregnancy up to 36 weeks gestation[35,36].

Expectedly, Esan was the most represented ethnic group accounting for 77.50%. This observed ethnic distribution may be because the health institution from which data was sourced is sited in Esan land where the entire population comprises of majorly persons from Esan ethnic group [26]. Similarly, Christianity was the dominant religion practiced by subjects in this study accounting for 93.70% possibly because Esan indigenes are predominantly Christians [37]. The wide variation in gestational ages at which a female patient is examined using USS to determine placental positioning before birth which is evidently void of pattern, could possibly be because labour begins when both a mother and baby are ready. Gestational age at point of delivery varies from one woman to another and from one pregnancy to another even for the same woman, and research has shown that when a baby is ready for life outside his mother's uterus, the baby's body releases a tiny amount of a substance that signals the mother's hormones to begin labour [38,39].

CONCLUSION

This study has emphasized the importance of determining placental location with some certainty, especially in pregnancies lasting 36 weeks or longer, because the placental location at 36 weeks is likely to stay same till birth. Knowing the placental position is crucial for healthcare provider to prepare for the possible pregnancy outcomes that can have a major impact on the health of the mother and the newborn, such as preterm labour, intrauterine growth restriction (IUGR), preeclampsia, and fetal malposition. The risk of pregnancy-related hypertension, gestational diabetes, and placental abruption, for example, may be increased by anterior or low-lying placenta, whereas posterior location may occasionally result in stillbirth and preterm birth. Thus, close observation can help healthcare providers easily identify pregnancies that are at risk, enable prompt interventions, and get ready for any pregnancy-related complications, which will help to reduce the rates of maternal and newborn morbidity and mortality. In this regard, routine ultrasound screening is essential for improving clinical judgment and maximizing birth outcomes.

Conflict of Interest

The authors declare no conflict of interest

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