

TRANSABDOMINAL SONOGRAPHIC DIAGNOSIS OF PLACENTA PRAEVIA IN A TERTIARY MATERNITY UNIT IN JOS, NIGERIA: HOW ACCURATE?

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ABSTRACT

Context: Ultrasonography has revolutionised the diagnosis and management of placenta praevia, a high risk pregnancy associated with life threatening maternal and fetal complications. Although transabdominal sonography (TAS) is a valuable obstetric imaging technique in this maternity unit, its value in the diagnosis of placenta praevia has not been assessed.

Objectives: To assess the accuracy and false positive rate of TAS in the diagnosis of placenta praevia and to determine the types of placenta praevia.

Study design, Settings and Subjects: A prospective descriptive study of all women with transabdominal sonographic diagnosis of placenta praevia in the maternity unit of Jos University Teaching Hospital, Jos, Nigeria between January 2006 and June 2009. All the patients had sonographic assessment with scanner Toshiba just vision 400, with a 3.5MHz curvilinear transducer. The presence or absence of placenta praevia was confirmed at caesarean delivery.

Main outcome measures: Accuracy and false positive rate of TAS in the diagnosis of placenta praevia as well as its types.

Results: Placenta praevia was confirmed intra-operatively in 121 out of the 137 patients with ultrasound diagnosis. Thus, the diagnostic accuracy of TAS was 88.3% and a false positive rate of 11.7% with about 68.8% of the false positive cases having abruptio placentae. Seventy four (61.2%) and 47 (38.8%) were major and minor degree placenta praevia respectively.

Conclusion: TAS is a valuable and accurate modality for the diagnosis of placenta praevia in this maternity unit but more vigilance is needed during the procedure so as to reduce the false positive rate. The use of vaginal ultrasonography in this centre may significantly improve the accuracy in the diagnosis of the condition.

Keywords: Placenta praevia, Transabdominal, Sonography, accuracy, false positive rate.

INTRODUCTION

Placenta praevia is a placenta that is partially or totally located in the lower uterine segment and is potentially life threatening to both the mother and the fetus, hence the need for accurate diagnosis before delivery and or onset of labour cannot be overemphasized. Bleeding from placenta praevia is one of the most acute life threatening obstetric emergencies. Prior to the availability of ultrasonography, placenta praevia was suspected in women presenting with painless antepartum haemorrhage and those with fetal malpresentation late in pregnancy but some women with the condition may not bleed until onset of labour¹. As a result of the sudden and unexpected nature of its presentation, early recognition and prompt appropriate management is imperative to avert or

reduce the complications associated with this high risk pregnancy. Hence ultrasonography has an important role in the detection of placental location and its availability and use has improved the management and outcome of these high risk pregnancies².

Diagnosis of placenta praevia was an early achievement in the pioneering studies of ultrasound

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by Ian Donald in the early 1960s and its introduction in obstetric practice have improved the diagnostic accuracy and enhanced intervention strategies and outcome³. Placenta praevia can now be diagnosed even before any vaginal bleeding occurs as a result of increased use of real time ultrasonography in majority of pregnant women^{4,5}.

Ultrasonographic classification of placenta praevia into major or minor degree⁶ which describe respectively total or no coverage of the internal cervical os by the placenta can be achieved through the abdominal, vaginal, perineal, rectal or translabial routes using the appropriate transducers. Trans-abdominal ultrasonography has an accuracy rate in the detection of placenta praevia of between 92 – 98%⁷⁻¹⁰. However, a full bladder needed to create acoustic shadow, poor image clarity due to obesity and overshadowing of the posterior placenta by fetal tissues may all cause suboptimal visualization of the placenta¹¹. Transvaginal ultrasonography is reported to be safe, better image quality, most beneficial in posterior placenta and more instructive than the conventional transabdominal ultrasound in cases of suspected placenta praevia^{8,12-15}. It has better accuracy rate and may be used to confirm inconclusive cases of placenta praevia by the trans-abdominal route^{12,16,17}. Transperineal sonography in the diagnosis of placenta with an accuracy of over 90%^{7,9,18} is also a safe, rapid and valuable complimentary method to the trans-abdominal modality. It is thought to provide better visualization of the internal surface of the cervix allowing confident diagnosis or exclusion of placenta praevia¹⁸. Translabial and transrectal ultrasonography are also useful methods for the diagnosis or exclusion of placenta praevia^{19,20} and the transrectal route has been shown to be equivalent to the standard transvaginal method in depiction quality and diagnostic safety without the imminent risks of transvaginal manipulation and infection²⁰. Transabdominal ultrasonography is the most commonly use obstetric imaging technique in this Obstetric unit but its value in the diagnosis of placenta praevia has not been studied. The purpose of this study is to determine the accuracy and false positive rate of TAS in the diagnosis of placenta praevia as well as the types of placenta praevia in our environment.

MATERIALS AND METHODS

This is a prospective study of all pregnant women with transabdominal diagnosis of placenta praevia

in the third trimester in Jos University Teaching Hospital over three and a half year period (January 2006-June 2009). The patients were scanned using scanner Toshiba JustVision 400, manufactured September 2001, with a 3.5MHz Curvilinear transducer. The scans were performed by Senior Registrars or Consultants within the department. For the purpose of this study, trans-abdominal ultrasound diagnosis of placenta praevia was made when the placenta with its lower margin lies below the dome of a full urinary bladder. Any patient whose urinary bladder was not full was instilled with normal saline using urethral catheter before the procedure was carried out. It was minor degree when the internal cervical os was not covered by the placenta and major degree when the internal os was completely covered. Caesarean section was the mode of delivery for all women with placenta praevia in this centre and sonographic diagnoses was compared to the placental location determined at caesarean delivery. The data was analyzed by simple percentages.

RESULTS

During the period spanning between January 2006 to June 2009, 137 patients were diagnosed with placenta praevia using the transabdominal ultrasonography but intra-operatively, 16 of them were discovered not to have the condition, giving an accuracy rate of 88.3% and false positive rate of 11.7%. Seventy four (61.2%) of the cases were major degree while forty seven (38.8%) were minor degree placenta praevia.

The average age of the patients was 30.1 years and one hundred and ten (80.3%) were aged 34 years and below. Majority of them (78.1%) were of parity 1 – 4. Table 1 shows the age and parity distribution of the patients. The average gestational age at ultrasound diagnosis was 35.8 weeks. One hundred and one (83.5%) of the patients with confirmed placenta praevia presented with vaginal bleeding while 20 (16.5%) of them were incidentally discovered at ultrasound scan for a different indication.

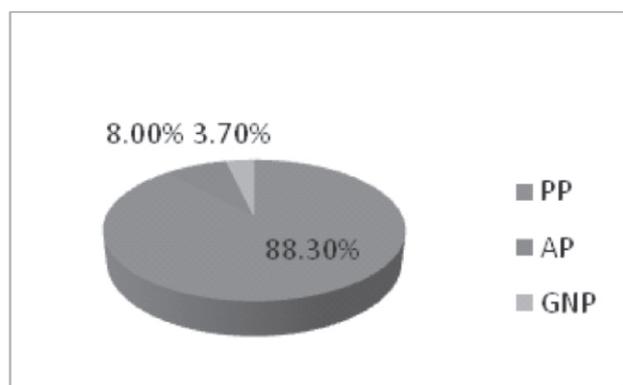
Eleven out of the sixteen patients found not to have placenta praevia at caesarean section had placental abruption (68.8%). Fig 1 shows the intra-operative findings among the studied patients.

Table 1: Age And Parity Distribution Of The Patients

Age Range	No. of Patients	Percentage (%)
20 – 24	27	19.7
25 – 29	35	25.6
30 – 34	48	35.0
35 – 39	21	15.3
40 – 44	6	4.4
Total	137	100.0
Parity		
0	11	8.0
1	32	23.4
2	22	16.1
3	17	12.4
4	25	18.2
> 5	30	21.9
Total	137	100.0

Para 0 refers to primigravida at time of presentation

Fig 1: Intra-operative findings



PP – Placenta praevia
 AP - Abruptio placentae
 GNP – Grossly normal placenta

DISCUSSION

Statement of the principal findings

Transabdominal sonography in the presence of a full urinary bladder by obstetricians is a valuable and accurate modality for the diagnosis of placenta praevia. Such procedures in the maternity unit instead of the radiology section reduce the time for appropriate intervention in emergency situations thereby lowering the high maternal and perinatal morbidity and mortality associated with this high risk pregnancy.

Strengths and weaknesses of the study design

This prospective study helps to assess the skills of Obstetricians in the department in the sonographic diagnosis of placenta praevia and this result may serve as a motivating factor for the training of incoming residents doctors. However, the fact that the procedures were carried out by different cadres of doctors with different levels of skills and the probability that some of them may not have ensured a full bladder before the diagnosis of placenta praevia are the obvious weaknesses of this study.

Comparison of the findings with those of other studies

The accuracy of trans-abdominal sonography in the diagnosis of placenta praevia in this study was 88.3% which is slightly lower than the figures of 97.7% and 92% reported by Adeyomoye et al in Lagos, Nigeria and Rani et al in Pondicherry, India respectively^{7,9}. However, it is higher than figures of 77%, 75.7% and 67.9% reported by other researchers from Irbid, Jordan, Kuala Lumpur, Malaysia and Yaoundé, Cameroon respectively^{8,21,22}. This may be attributed to the fact that the dome of a full urinary bladder was used as a reference point in this study in contrast to half full bladder and graded bladder distension by other authors. Also two different cadres of doctors were involved in the scan procedures in this study as opposed to others where all the scans were done by the same individual thereby reducing the contribution of human errors. On the other hand, figures as low as 42% and 44.4% accuracy rate were reported from Munich and New York respectively^{20,23}.

Adeyomoye et al, Rani et al and Tan et al reported respectively false positive rate of 2.3%, 8% and 7%^{7,9,21} in the diagnosis of placenta praevia using the trans-abdominal route. This is in contrast to the finding of 11.7% in this study. This relatively high false positive rate may not be unconnected to the fact that full urinary bladder tend to distort the anatomy of the uterine cervix and there is suboptimal visualization of the cervix in trans-abdominal sonography as a result of obesity and overshadowing of posterior placentas by fetal part(s) thereby affecting the accuracy of the diagnostic method¹¹.

In this study also, 74 (61.2%) of the cases of placenta praevia were major degree while 38.8% were minor degree. This is comparable to the findings from Edinburgh⁵ but in contrast to those from Lagos and Nnewi where minor degree placenta praevia accounted for 59.0% and 62.7% of cases

respectively^{24,25}. However, this classification is of little clinical significance as both types of placenta praevia are associated with potentially life threatening haemorrhage.

In conclusion, the diagnostic accuracy of transabdominal sonography in the diagnosis of placenta praevia is relatively high in this maternity unit but more vigilance is needed during the procedure so as to reduce the false positive rate.

Meaning of the study and implications for clinicians and policymakers

This study revealed that Obstetricians can effectively apply the skills acquired during their training (radiology posting) in the maternity unit rather than relying on the radiology department for basic obstetric sonographic diagnosis. This reduces decision-intervention interval in emergency situations as in antepartum haemorrhage due to placenta praevia, a common cause of maternal mortality, hence the need for Obstetricians to acquire basic skills in obstetric sonography.

The Hospital authorities in the various tertiary health centres in Nigeria should make ultrasound equipment available in the maternity units to ease the logistic problems that may negatively affect timely institution of appropriate management in these high risk pregnancies where delay could mean grave consequences for the mother, baby or both.

Specific area of future research

Evaluation of the use of transvaginal sonography for the diagnosis of placenta praevia as well as assessing the risk of bleeding secondary to placement of the vaginal transducer and comparison of its accuracy with the transabdominal approach is a worthwhile research.

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