

# Obstetric ultrasound: Indications and referral in a diagnostic imaging facility in Makurdi, North-central Nigeria

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## Abstract

**Background:** Ultrasonography is an indispensable tool in Obstetric and Gynecological practice. Usually, trained health personnel are expected to request for a scan based on a valid indication as well as providing relevant clinical information to the sonographer.

**Objective:** To determine the indications and source of referral for Obstetric ultrasound scan at a diagnostic imaging facility.

**Methods:** A retrospective data extraction from the health records at a Diagnostic Imaging Centre in Makurdi by a trained health record staff, between May and July 2016. SPSS version 20 was used to analyze data. Chi square was used as a test of statistics with P- value  $\leq 0.05$  at 95% CI as significant.

**Results:** Five hundred (500) patients were studied; most (58.4%) were aged 20–29 years. Majority (97.6%) were married. Most (46.8%) had tertiary education, were multiparous (67.4%), civil servants (36.6%) and Christians (76.6%). While 297 (59.4%) of patients were referred by health workers for ultrasound scan, 203 (40.6%) were self-referrals. As much as 261 (52.2%) of the patients did not have stated indication, out of which 113 (43.3%), 64(24.5%), 52(19.9%), 32(12.3%) were referred by self, Community health workers, Nurse/Midwife and doctors respectively. The stated indications included; Fetal wellbeing 21 %, viability 6 %, diagnosis of pregnancy 4.8 %, dating 3.2 %, gender determination 2.6%, placenta localization 2.2 %, vaginal bleeding 2.2% amongst others. Source of referral was significantly related to level of education and indications ( $P \leq 0.05$ ).

**Conclusion:** Self-referral and non-stated indications for Obstetric scan especially amongst the self-referrals and lower cadre of health personnel was significantly high. Stated indications include; fetal wellbeing, viability, diagnosis and dating of pregnancy. Education and enlightenment of patients and training of Health personnel on Obstetric ultrasound is recommended.

## Introduction

Ultrasonography is an indispensable tool in Obstetric and Gynecological practice worldwide [1-3]. It is usually referred to as the third eye of the Obstetrician. Actually, ultrasound brought about a remarkable revolution in clinical practice since the 1950s when it was popularized by Ian Donald at Glasgow. Today; there are few Obstetric conditions that do not require a contribution from ultrasonography for management. Several women feel their pregnancies are not complete without at least one ultrasound scan [3]. However, several years back and up till now, the routine use of ultrasound scan has been considered to be controversial [4,5].

Despite the debate whether the clinician request or not, pregnant women would opt to do a scan for several reasons which may not be considered necessary to the clinician at that moment [4]. A study done in Enugu, South East Nigeria showed half of the women interviewed expressing the view that women should have the right to request for a scan at any time [5]. This argument of source of referral notwithstanding, the technology of ultrasonography offers the clinician the opportunity of assessing the fetal status, dynamics and morphology with high resolution images sometimes with 3D or 4D scanners.

The information received by the clinician from the sonographic computations and assessment done by a competent sonographer with

adequate knowledge of fetal anatomy, physiology and biochemistry can enable fetal intrauterine therapy. So, the technology of fetal ultrasonography has moved from just mere diagnostic purposes to therapeutic adventures in maternal-fetal medicine. Some of the diagnostic uses of ultrasonography in obstetrics include; Diagnosis of pregnancy, gestational age estimation, vaginal bleeding of unknown origin, suspected multiple gestation, adjunct to amniocentesis, suspected hydatidiform mole, adjunct to cervical cerclage placement, suspected intra uterine fetal demise (IUD) and sex determination etc.

The challenge in modern ultrasonography is where self-referrals are made, useful clinical information are missing which may affect the accuracy of the procedure as well as interpretation of results thereby creating the possibility of patient mis-management. Similarly, referrals by lower cadre of health personnel with a lot of inadequacies create

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problems for the managing physician. The sonographer on the other hand particularly in a private diagnostic facility, do not bother about the source of referral whether it was by a physician, other cadre of health personnel or self because of the economic gains derived from the procedure. Generally, there is a poor awareness and knowledge on when to do an ultrasound scan, who should request for it and the expertise of the procedure in our environment. More so, the pattern of source of referral and what the indications are have not been published in our environment of clinical practice hence the need to have a baseline data for further research work.

**Objectives**

To determine the source of referral and indications for Obstetric ultrasound scan at a private diagnostic imaging facility.

**Methodology/Study design**

A retrospective study in which data of clients who had Obstetric scan at the Musafaha Diagnostic Imaging Centre in Makurdi between May and July 2016 was extracted from the electronic records by a trained record staff of the facility. The facility is a private facility that receives referrals from all tiers of health care delivery centers in the state. All the scans were done using a Toshiba ultrasound machine (4D nemio Toshiba Medical system Corporation, Otawara-Japan) fitted with endovaginal and curvilinear transducers with frequencies of 6MHz and 3.7MHz respectively. First trimester pregnancies were evaluated with the endovaginal transducer while others were done using curvilinear. All the scans were done by a single person which is the consultant radiologist.SPSS version 20 (IBM), New York, USA was used to analyze data. Chi square was used as a test of statistics with P-value ≤ 0.05 at 95% CI as significant.

**Results**

Five hundred (500) patients were studied; most (58.4%) were aged 20-29 years. Majority (97.6%) were married. Most (46.8%) had tertiary education, were multiparous (67.4%), civil servants (36.6%) and Christians (76.6%). While 297 (59.4%) of patients were referred by health personnel for ultrasound scan, 203 (40.6%) were self-referrals. As much as 261 (52.2%) of the patients did not have stated indication on referral forms, out of which 113 (43.3%), 64(24.5%), 52(19.9%), 32(12.3%) were referred by self, Community health workers, Nurse/Midwife and doctors respectively. The stated indications include; Fetal wellbeing 21%, viability 6%, diagnosis of pregnancy 4.8%, dating 3.2%, gender determination 2.6%, placenta localization 2.2%, vaginal bleeding 2.2% amongst others. Women who were educated are more likely to get a referral from a clinician (P≤ 0.05).

**Discussion**

Most of the women as seen in Table 1 were in the age bracket of 20 - 29 and followed by 30-39 years. This constitute the reproductive ages at which most women get married and hope to complete their reproductive careers respectively. This finding is similar to that of Eze et al. About 60% of the referrals for Obstetric scans were done by health personnel. This is similar to the findings of the study in Sokoto where most scans were requested by clinicians. However, in a similar study in Enugu all scans were requested by clinicians [1,5]. It is actually ideal for the clinician to initiate prenatal ultrasound scan not just as a routine procedure but with a valid indication so as to make the test more relevant to patient care.

The finding of lower cadre of health personnel being involved in requesting for USS is as a result of the fact that the centre is a private

**Table 1.** Socio-demographic features of the women

Age Group	Frequency(N 500)	Percentage (100%)
≤19	33	6.6
20-29	292	58.4
30-39	169	33.8
40-49	6	1.2
<b>Marital Status</b>		
Single	52	10.4
Married	448	89.6
<b>Education</b>		
None	19	3.8
Primary	54	10.8
Secondary	193	38.6
Tertiary	234	46.8
<b>Parity</b>		
0	127	25.4
1-4	337	67.4
≥5	36	7.2
<b>Occupation</b>		
Trading	161	32.2
Civil Servant	183	36.6
Farmer	25	5.0
Students	49	9.8
Housewife	82	16.4
<b>Tribe</b>		
Tiv	197	39.4
Idoma	84	16.8
Igede	20	4.0
Hausa	100	20.0
Igbo	48	9.6
Yoruba	8	1.6
Others	43	8.6
<b>Religion</b>		
Christians	373	74.6
Muslims	127	25.4

imaging centre. Patients are more at home were such request could be accommodated. The worry however is whether these cadres of personnel do have the required clinical skill to guarantee a sensible request, interpretation of results and patient care or appropriate referral. The fact that most of the non-stated indication were from these lower cadre of health personnel compared with that of the doctor as seen in the study suggests their clinical competence is doubtful (Figure 1).

Similarly, of significant interest is generally the large number of self-referrals (40%). Some of the clients could be attending or intended to attend ante natal care in private, secondary or primary health care centers. At times women want to satisfy their curiosity or have an experience. On the other hand, most women feel they have the right to scan at any time, and a legitimate reason to do so [5]. They will seek for a scan if it is not requested for because they expect that it should be done [3].

Although it is good to do intrauterine assessment of fetal wellbeing especially in early pregnancy to detect the presence of fetal problems that may require prompt treatment, some clinicians are compelled by their clients to being addicted to USS. These clients have the assumption that ultrasound machine can detect all problems or diseases in the human body. In fact, outside of Obstetric practice this procedure has replaced clinical skill of most clinicians today. These clinicians scan before taking history and doing physical examination! This happens mostly with private practitioners and medical officers in secondary public health institutions. This is a bad attitude for young clinicians who at times

work in such environments because their clinical skill becomes blunted as they later seek to grow in their professional career. Thus, the act of clinical clerkship is unfortunately lost.

This study like other similar studies have shown as demonstrated in Table 2 that education of the women significantly influences the use of Obstetrics ultrasound scan [1,5,6]. The more educated a woman is the more likely she is to get a referral from a physician to do an Obstetric scan. This clearly demonstrates the importance of a girl child education. There is also need for public health enlightenment at preferably antenatal care clinics for ultrasound scan focusing on availability, recommended period, referral system and dispelling myths and misconception about the procedure. The finding of as much as 148(56.7%) of referrals without stated indications amongst health workers including clinicians clearly demonstrates the need to inform and train the health personnel about ultrasonography [7]. A clearly stated indication will help the sonographer to be more focus during the procedure so as to come out with a more useful report for the managing clinician. Secondly, the myth of over estimating the diagnostic power of the ultrasound machine will be aborted.

The commonest indications as seen in Table 3 were fetal wellbeing, fetal viability, pregnancy diagnosis, dating, gender determination, vaginal bleeding e.t.c. This is similar to findings in other studies [2,4,8,9]. Especially the young women married or unmarried who are not on contraceptives, at times conception happen without a prior plan hence the need to confirm with USS. Again, the possibility of a diagnostic dilemma or lack of access or confidence in other methods of testing for pregnancy in which case USS is required to settle the matter [10]. For those who have a desirable pregnancy it is normal for the woman to want to have assurance of normal fetal development. Again, it is possible that some women especially the primigravidae, those who were on contraceptives, breastfeeding mothers etc not to remember the ages or dates of their pregnancies hence the need for dating with an early USS.

Gender determination is most at times premised on preference for a particular sex [2,11]. In our settings in Africa, most families prefer the male sex due to issues of inheritance and continuity of family lineage. It is therefore not a strange request by women even in their

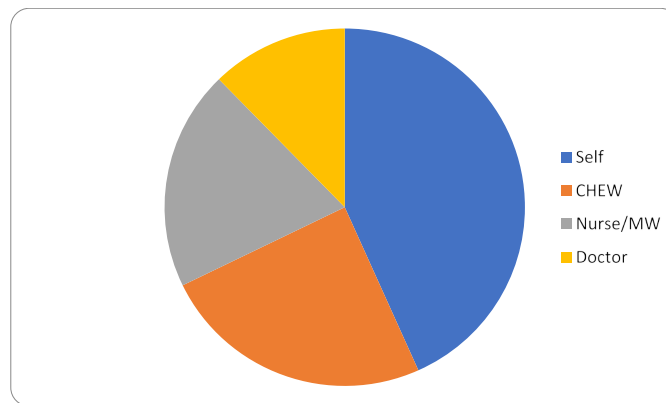


Figure 1. Sources of referral among non-stated indications

Table 2. Relationship between education and source of referral

Level of Education	None	Count	Scan Requested by who		Total
			Self	Doctor	
	None	6	13	19	
		31.6%	68.4%	100.0%	
	Primary	24	30	54	
		44.4%	55.6%	100.0%	
	Secondary	65	128	193	
		33.7%	66.3%	100.0%	
	Tertiary	108	126	234	
		46.2%	53.8%	100.0%	
Total		203	297	500	
		40.6%	59.4%	100.0%	

Pearson Chi Square= 7.799, df=3, sig 2-tail=0.05, p=0.047

Table 3. Indications for ultrasonography

Indication	Frequency(N=500)	Percentage (100%)
Not stated	261	52.2
Fetal wellbeing	105	21.0
Fetal viability	30	6.0
Diagnosis of pregnancy	24	4.8
Dating	16	3.2
Gender determination	13	2.6
Vaginal bleeding	11	2.2
Others	40	8.0

first conferment's to prefer a baby boy so as to cement their position in their newly contracted marriages. Ekele et al reported that women who had a prior female baby are more likely to scan for fetal gender than those who had a prior male baby [11]. In some communities such as in India, sex selective scans are even used for the purpose of selective abortions [10]. Suboptimal care during the antenatal period in resource constrained environments like ours also make USS for biophysical profiling necessary in pregnancies complicated with hypertension, diabetes mellitus, sickle cell disease, cardiac disorders, asthma etc.

Interestingly, Nigerian women on a general note as reflected in this study have demonstrated a high level of awareness, belief and acceptability in ultrasound unlike in other environments where there are cultural, social and psychological barriers to acceptability and utilization of ultrasound services where they exist [10,12].

### Conclusion/Recommendation

Self-referral and non-stated indications for Obstetric scan especially amongst the self-referrals and lower cadre of health personnel was significantly high. Stated indications include; fetal wellbeing, viability, diagnosis and dating of pregnancy. Education and enlightenment of women and training of Health personnel on Obstetric USS is recommended.

### Limitations of the study

1. Gaps in information on data for certain clients typical of a retrospective study.
2. The high number of non-stated indications over-tasked the sonographer and will subsequently affect the result made available to the managing physician for the care of the client.

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### Conflict of interest

The authors have no conflict of interest to declare.

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