

A Hospital Based Retrospective Assessment of the Baseline Pattern of Obstetric Sonography Referrals, Indications, and Findings

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Abstract

Aim: The aim of the present study was to assess the baseline pattern of obstetric sonography referrals, indications and findings at Tertiary care hospital in Bihar region.

Methods: This study retrospectively evaluated the baseline pattern of obstetrics sonography referrals, indications, and findings of 1000 patients who underwent prenatal ultrasound scan at the department of radiology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India for a period of 18 months.

Results: A good number, 900 (90%) of the respondents were married and majority 440 (44%) were civil servants, 630 (63.0%) had tertiary education. Their ages ranged from 16 to 47 years, with a mean age of 29.7±5.5 years, median age of 30.0 and 30.0 as the modal age. The predominant age range is the 26-30, with 370 (37%) respondents, followed by the 31-35 age range, with 250 (25%). The least number, 5 (0.5%) was from the 46-50 age range. The distribution of source of obstetric sonography referrals shows that the number of patients referred by physicians, 800 (80%), were higher than those referred by self, 150 (15%), and other healthcare workers, 50 (5%). 150 (15%) pregnant women were positive for the abnormalities suspected by physicians prior to requesting sonographic evaluation whereas, 850 (85%) were negative. A total of 20 positive cases (incidentalomas) were found as a result of routine antennal (ANC) scanning for general maternal reassurance. Regression analysis showed that the level of confirmation of abnormalities suspected during prenatal ultrasonography was statistically significant and well correlated with findings ($r=0.510$, $p=0.011$). Confirmation of PV-bleeding recorded the highest positive rate 25.

Conclusion: Physicians were the main source of prenatal referrals at BSUTH, with the referral pattern greatly influenced by biosocial factors. Confirmation of fetal wellbeing was the commonest indication for referral, whereas, majority of findings were negative for the abnormalities the physicians suspected. Thus, establishing the baseline pattern of obstetric sonography referrals, indications, and findings in our environment, which are helpful for planning and future research.

Keywords: Baseline Pattern, Findings, Indications, Obstetric Sonography, Referrals.

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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]

Obstetric (prenatal) ultrasonography has become the gold standard for the diagnosis of early to late trimester pregnancy. [6] Widely regarded as a cost-effective, non-invasive, safe, and accurate method of examining the foetus, prenatal sonography, since its introduction in the 1950s, has drastically revolutionized the practice of obstetrics by allowing visualization of the foetus and the intrauterine environment. [7] Thus, the technology is now used to assess 40–60% of pregnancies with the percentage of pregnancies that have undergone at least four ultrasound examinations in the second or third trimester on the increase. [8,9]

Although some patients may choose to refer themselves, prenatal ultrasound is usually done at the request of the physicians. A request typically includes information such as the referring physician's name, the patient's name, a provisional diagnosis, and/or clinical data,

which assists the sonographer and sonologist to not only interpret the findings, but also to demonstrate and clarify sonographic anomalies in the light of any clinical information and the findings of additional tests. [9] Pregnant women may choose to have a scan for a variety of reasons that may or may not be medically and ethically justifiable, regardless of whether the physician recommends it or not. [4] Ikeako et al. reported that more than half of the pregnant women 110(52.9%) felt that they should be able to obtain a scan at any time. [5] The problem with self-referrals in modern prenatal sonography is that crucial clinical information is often missing, which might impair the procedure's accuracy with misinterpretation of data, potentially leading to unjustified diagnosis and treatment of the patient. Similarly, referrals from lower-level health-care workers are fraught with a lot of flaws causing confusion for the attending physician. In general, there is a lack of understanding and awareness about when an ultrasound scan should be performed, who should request one, and the sonographer's skill in our setting. [12]

The aim of the present study was to assess the baseline pattern of obstetric sonography referrals, indications and findings at Tertiary care hospital in Bihar region.

Materials and Methods

This study retrospectively evaluated the baseline pattern of obstetrics sonography referrals, indications, and findings of 1000 patients who underwent prenatal ultrasound scan at the department of radiology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India for a period of 18 months.

Inclusion criteria were pregnant women who have had complete records in the prenatal ultrasound archives of the department of radiology, BSUTH, which were well provided with all but mostly the following desired information: biosocial data such as age, education, parity, gestational age and marital status; indication for the scan and/or provisional diagnosis, source of referral (physician, self-referral or by other healthcare workers), and the prenatal sonography findings.

Exclusion criteria were scanty records without the desired information, or use of non-standardized abbreviations. All radiological records, which were not for obstetric scan were also excluded.

All obstetrics sonographic examination was done using Siemens Sonoline G-50 machine fitted with a curvilinear 2.0-5.0MHZ transabdominal transducer.

The data obtained was entered into a spreadsheet and analysed using statistical package for social science (SPSS) version 23 software (IBM Inc., Chicago, Illinois, USA 2015) and Microsoft Excel 2007. Chi square was used as a test of statistics and the statistical significance was determined using a $p < 0.05$ value. The data distribution was displayed using tables, figures, and percentages.

Results

Table 1: Distribution of biosocial information of respondents

Variable	Frequency	Percentage (%)
Age groups		
16-20	60	6
21-25	150	15
26-30	370	37
31-35	250	25
36-40	140	14
41-45	25	2.5
46-50	5	0.5
Marital status		
Married	900	90
Single	70	7
Divorced	30	3
Occupation		
Civil servant	440	44
Housewife	200	20
Business	170	17
Farming	90	9
Trading	40	4
Teacher	30	3
Student	20	2
Medical Doctor	10	1
Education		
None	30	3
Primary	40	4
Secondary	300	30
Tertiary	630	63

A good number, 900 (90%) of the respondents were married and majority 440 (44%) were civil servants, 630 (63.0%) had tertiary education. Their ages ranged from 16 to 47 years, with a mean age of 29.7 ± 5.5 years, median age of 30.0

and 30.0 as the modal age. The predominant age range is the 26-30, with 370 (37%) respondents, followed by the 31-35 age range, with 250 (25%). The least number, 5 (0.5%) was from the 46-50 age range.

Table 2: The distribution of source of referral, marital status and the pregnant women's literacy level

Source of referral	Marital Status	Educational Attainment				
		None	Primary	Secondary	Tertiary	Total
Physician-Referred	Married	40	60	200	400	700
	Single	2	2	11	45	60
	Divorced	2	0	10	28	40
Total		44	62	221	473	800
Self-Referred	Married	2	5	56	80	143
	Single	0	0	1	1	2
	Divorced	0	0	3	2	5
Total		2	5	60	83	150
Other Healthcare-workers' Referred	Married	0	5	10	30	45
	Single	0	0	0	0	0
	Divorced	0	0	0	5	5
Total		0	5	10	35	50

The distribution of source of obstetric sonography referrals shows that the number of patients referred by physicians, 800 (80%), were higher than those referred by self, 150 (15%), and other healthcare workers, 50 (5%).

Table 3: The distribution of clinical Indications with prenatal ultrasound findings

Clinical Indications	Ultrasound Findings		
	Negative	Positive	Total
Fetal well being	220	30	250
Routine ANC Scan	130	20	150
Dating	110	10	120
Fetal Viability	90	10	100
Placenta Localization	45	5	50
PV Bleeding	20	25	45
Expected fetal weight (EFW)	32	6	38
None	32	4	36
Biophysical Profile (BPP)	22	8	30
Lower Abdominal Pain (LAP)	10	8	18
Anomaly scan	17	0	17
Abortion	9	7	16
Sex Determination	12	4	16
Malaria in Pregnancy	13	3	16
Amenorrhoea	10	2	12
Intrauterine Growth Retardation (IUGR)	4	68	12
UTI in Pregnancy	6	4	10
Fetal Macrosomia	7	3	10
Premature rupture of membranes	8	2	10

Absent fetal movements	3	6	9
Multiple Pregnancy	8	1	9
Intrauterine Fetal death (IUFD)	5	2	7
Cervical Incompetence	4	3	7
Prolonged Labour	6	0	6
Malpresentation	1	5	6
Total	850	150	1000

150 (15%) pregnant women were positive for the abnormalities suspected by physicians prior to requesting sonographic evaluation whereas, 850 (85%) were negative. A total of 20 positive cases (incidentalomas) were found as a result of routine antenatal (ANC) scanning for general maternal reassurance. Regression

analysis showed that the level of confirmation of abnormalities suspected during prenatal ultrasonography was statistically significant and well correlated with findings ($r=0.510$, $p=0.011$). Confirmation of PV-bleeding recorded the highest positive rate 25.

Table 4: The distribution of Pearson's correlation (r) between selected variables

Variable	Pearson's correlation (r)	P-Value
Source of referral vs Clinical indications	0.354	0.000
Clinical indications vs Findings	0.179	0.000
Source of referral vs Findings	0.149	0.000
Source of referral vs Marital status	0.003	0.930
Source of referral vs Education	-0.106	0.002
Source of referral vs Parity	-0.080	0.021
Source of referral vs Age	-0.025	0.475

Whereas there was a statistically significant positive correlation between both clinical indications ($r=0.354$, $p = 0.000$) and prenatal ultrasound findings ($r=0.149$, $p = 0.000$) with source of referral, the relationship was a negative one with both educational status ($r= -0.106$, $p = 0.002$) and parity ($r= -0.080$, $p = 0.021$). The relationship between age ($p = 0.475$) and marital status ($p = 0.930$) with source of referral was not statistically significant. However, a statistically significant co-relation existed between clinical indications and prenatal ultrasound findings ($r=0.179$, $p = 0.000$).

Discussion

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 (IUFD) and sex determination etc.

The age range in our study is 16-47 years, with a mean age of 29.7 ± 5.5 years. Our mean age was slightly lower than the reported mean age of 30.1 ± 4.5 years from western Nigeria⁴, however it was higher than the 22.4 ± 3.2 and 26.9 ± 4.8 years respectively reported in eastern⁵ and northern Nigeria. [1] Our reported mean age represents the average age of marriage

in our region and also corresponds to the reproductive age at which most women marry and hope to complete their reproductive careers. [10]

Majority 900 (90%) of our expectant mothers were married. This corroborated with the findings of similar studies [11,12], in which 6264 (85.2%) and 845 (91.5%) pregnant women, respectively had husbands. Women who are married are more likely to complete their routine antenatal care (ANC) visits with resultant prenatal ultrasound scans. Certain cultures, particularly in Africa, frown at extramarital pregnancy and even consider pregnant women without a husband as a disgrace. Consequently, unmarried pregnant women frequently conceal their pregnancies due to social pressures, resulting in fewer ANC visits. [11,12] More than half of our expectant mothers were degree holders. This is to be expected, as the level of education determines the woman's occupation, her degree of utilization of ultrasound technology, and how well informed she is about her rights regarding reproductive health as well as gender equality. [13,14]

Majority of our patients 800 (80%) were referred by a physician, with self-referrals accounting for a smaller proportion 150 (15%) of all requests evaluated. Our findings were in agreement with previous reports [9,10] where most scans were requested by physicians. This clearly shows that physicians were concerned about the safety of the mother's pregnancy and the complications that could endanger the mother, foetus, or both. [9] The proportion of patients who self-refer shows that, as long as they have the financial means to do so, they are willing to forgo the traditional patient-physician relationship in order to obtain a scan. This frequently puts physicians under pressure to order an ultrasound scan for indulgence rather than necessity. [9,15] Our commonest indication for prenatal sonography was confirmation of fetal

wellbeing, followed by routine ANC scan and then dating. These findings were consistent with previous reports. [10] There was, particularly room for agreement with Utoo et al. [10], in that both studies were carried out in the same middle-belt region of Nigeria, even though ours was conducted at a public health facility. But contradictory to our findings, other researchers [4,5,9] reported that the most common indications for prenatal US were confirmation of cyesis, fetal viability, and fetal observation, in that order. The general apprehension and enthusiasm of the expectant mother and her immediate family members is the motivation factor for the desire to have confirmation of fetal wellbeing in a community like ours, where matrimonial success is based on conception and the eventual delivery of a healthy, live baby. [4]

Despite the fact that fetal gender disclosure is an ethically unjustifiable and non-medical indication for prenatal US [16] a minority 16 (1.6%) of our pregnant women still used the technology to determine the sex of their unborn child. Women who have had fewer than two pregnancies 9(69.0%) were by far more likely to request gender disclosure as shown in figure 3. The low numbers of pregnant women desirous of fetal gender disclosure during our research may just be coincidental; however, they compared favourably with the findings by Utoo et al. [10], in which 13(2.6%) women had prenatal US for gender disclosure. 150 (15%) pregnant women were positive for the abnormalities that physicians suspected before requesting sonographic evaluation, while 850 (85%) were negative. This is indicative that some clinical indications did not match-up with the prenatal US findings. [9] Furthermore, our abnormality rate was much lower when compared to the findings of other researchers [17,18] both of whom reported nearly twice as high abnormality rate in percentage terms.

Mills et al. [19] asserted that the incidence of abnormalities was not significantly different between sources of referrals. The degree of confirmation of abnormalities suspected during prenatal ultrasonography in our index study was, however statistically significant and correlated well with findings ($r = 0.510$, $p = 0.011$). Confirmation of PV-bleeding recorded the highest positive rate 25 (25%). The recommendations are to an extent, influenced by previous research by Ohagwu et al. [20] They are aimed at womenfolk, governments, physicians and other healthcare workers, as well as health institutions. [21]

Conclusion

Before referring expectant mothers for a scan, physicians and other healthcare workers should properly inform them of the value of prenatal ultrasound in the antenatal clinic. Sonographers should augment this with additional prenatal antenatal instructions before, during, and after the scan. Health institutions should build more ultrasound scanning centers as integral parts of the antenatal clinics to improve access to prenatal ultrasound and eliminate the long distance between the antenatal clinic and the ultrasound center. Institutions should also train more clinical staff to operate the US machine and ensure prompt and effective prenatal ultrasound service. 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.

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