

## EXPERIENCE AND PERCEPTION OF ULTRASOUND USE IN ANTENATAL CARE AMONG WOMEN IN A TEACHING HOSPITAL OF COASTAL KARNATAKA

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### ABSTRACT

#### BACKGROUND

The recent advances in methods of prenatal diagnosis, particularly prenatal ultrasound have resulted in a better understanding of certain congenital anomalies and consequently the improvement in surgical and medical procedures to treat birth defects earlier with improved outcomes. It also has a positive psychological effect on the expectant mothers and gives them a sense of reassurance.

Objectives - To study the perceptions about Antenatal Ultrasound use of the recently delivered women and to assess the experience of antenatal ultrasound scanning among the study subjects.

#### MATERIALS AND METHODS

183 women who have just delivered at the Medical College Teaching Hospital and waiting to be discharged.

#### RESULTS

On an average, most of the subjects had undergone three-to-four antenatal visits, which is according to the national guidelines; 102 subjects (55.7%) were satisfied with their overall experience during the antenatal scan, while 52 subjects (28.4%) rated it an average experience; 29 subjects (15%) were left dissatisfied with their experiences during their antenatal scans. The reasons contributing towards subject dissatisfaction included prolonged waiting periods for the scan, poor communication between the radiologist, nursing staff, preference for a female radiologist and prolonged time taken to receive the report.

#### CONCLUSION

Majority of subjects were aware of the benefits of antenatal ultrasound and had very good access to Healthcare.

#### KEYWORDS

Antenatal Scan, Perception, Satisfaction, Coastal Karnataka.

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#### BACKGROUND

Ultrasound imaging presently forms an essential part of antenatal care worldwide. This facility is now available in most Government and Private Health Facilities, both in developing and developed nations.<sup>1</sup>

Ultrasound is safe, portable, less expensive than other imaging modalities, non-invasive and has a real-time imaging capability that is essential in obstetrics. The recent advances in methods of prenatal diagnosis, particularly prenatal ultrasound have resulted in a better understanding of certain congenital anomalies and consequently the improvement in surgical and medical procedures to treat birth defects earlier with improved outcomes.<sup>2</sup>

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In addition to the medical indications for antenatal ultrasonography, some pregnant women have certain expectations of ultrasound examination; they may also want to have ultrasonography for various reasons. These include checking for foetal abnormalities to see that all was normal for their own reassurance and assessing foetal growth. Others include checking for foetal viability, foetal sex determination, checking for number of foetuses, determination of gestational age and placental localisation.<sup>1</sup>

Apart from the many medical benefits of antenatal ultrasound, the procedure is also known to have a positive psychological effect.<sup>3</sup> Generally, most mothers are happy when they see their foetuses on the monitor of the ultrasound machine, an indication of the viability of the pregnancy.<sup>2,4,5</sup> This has been seen to be associated with a significant reduction in anxiety levels, depression and somatic symptoms after the ultrasound scan. The negative side of ultrasound use is when there are significant morphological defects or other unexpected findings like multiple pregnancies, which may have adverse effects on the mother and may provoke an emotional crisis.<sup>1</sup>

During sonograms, women in developing countries request for determination of the sex of the baby, expected

date of delivery, the position of the baby, and the reassurance that the baby is in good health. Often, the expectations from these examinations are high without appropriate regards to the technological limitations due to poor counseling.<sup>2</sup>

A study from Denmark revealed that the reasons most frequently identified as being important for having ultrasound were to check whether the baby had any abnormality (60% of women), to see that all was normal (55%) and for own reassurance (44%).<sup>6</sup> Examination of the effect of women’s background factors revealed statistically significant differences with respect to socio-demographic, obstetric and attitudinal factors.

The study that explored women’s expectations and experiences of routine ultrasound screening during pregnancy in a nationwide sample from Sweden<sup>7</sup> found that most of the women had a positive experience of the examination; 57% were very positive and 38% were positive. Majority of women expected that the second-trimester ultrasound scan would confirm that their baby was doing well.

A Syrian study<sup>8</sup> described that the women accepted use of Ultrasound during pregnancy uncritically nearly all the time. The scans gave them reassurance that the baby was healthy; the pregnancy was progressing well and allowed them to learn the sex of the baby. The women also reacted positively to the antenatal educational messages that were conveyed using scans.

Ultrasound is one of the many technologies that were initially developed in affluent parts of the world, but is now gaining popularity in the developing world. We proposed to evaluate how pregnant women from the coastal part of Karnataka who had gone through pregnancy and had had live births perceived the use of this technology and thereby assess their experience of antenatal ultrasound scanning.

**Objectives of the Study**

1. To study the perceptions about Antenatal Ultrasound use of the recently delivered women in a Medical College Teaching Hospital of Coastal Karnataka.
2. To assess the experience of antenatal ultrasound scanning among the study subjects.

**MATERIALS AND METHODS**

**Study Setting**

A Medical College Teaching Hospital situated in the Coastal City of Karnataka state.

**Study Design**

Cross-sectional study.

**Study Population**

Women who have just delivered at the Medical College Teaching Hospital and waiting to be discharged.

**Inclusion Criteria**

- All those who were willing to participate in the study
- Subjects who were successfully able to complete their pregnancy to term and delivered healthy live babies either by normal delivery or caesarean section.

**Study Duration**

June to September 2016, a period of four months.

**Sampling and Sample Size**

- Census method of sampling was used in the selection of study subjects, i.e. all the subjects satisfying the inclusion criteria during the period of data collection were included in the study till the sample size was achieved.
- The following formula was used to calculate the sample size.

$$n = \frac{Z^2 * p * q}{e^2}$$

Where n is the required sample size  
Z is the normal standard deviation, which is equal to 1.96 at 5% significance level.

P is 19.3%, which denotes one of the most common perceived advantages (assessment of foetal well-being) as mentioned by the study respondents in the reference study<sup>1</sup>  
q is equal to 100-p = 80.7%.

The Allowable error (e) is 6%.  
Sample Size (n) =  $z^2 \times p \times q \times 1.3 / e^2 + 10\%$  non-response rate  
=  $(1.96)^2 \times 19.3 \times 80.7 / 6^2$   
=  $3.842 \times 19.3 \times 80.7 / 36$   
=  $166 + 17$  (10% non-response rate)  
= 183

**Method of Data Collection**

After obtaining the Ethical clearance from the Institutional Ethics Committee, necessary permission to conduct the study was obtained from the Hospital authorities. Written informed consent was obtained from the respondents after explaining the nature and objectives of the study in the local language. Data was collected by interview method using a semi-structured questionnaire. The questionnaire was anonymous and anonymity was maintained throughout the study.

Data on the dependent variables was collected by devising questions on Perceptions and Experiences about antenatal ultrasound from the study subjects.

**Statistical Analysis**

Data was analysed using SPSS (SPSS Inc., Chicago, USA; Version 12.0). Descriptive statistics (frequencies, means and standard deviations), Chi square test was used to determine the relationship between the various social, demographic variables and perceptions/experiences of the women regarding antenatal ultrasound. The statistical significance level was fixed at  $p < 0.05$ .

**Ethical Issues**

The study was started after approval from the Institutional Ethics Committee for the study. Written informed consent was obtained from the respondents after explaining the nature of the study in the local language.

**RESULTS**

Age (Years)	Frequency	Percentage
< 20	43	23.49%
21 – 25	56	30.6%
26 – 30	39	21.31%
31 – 35	29	15.8%
>/= 36	16	8.74%

**Table 1. Distribution of Subjects according to Age**

The subjects included in the study were predominantly in the age group of 18 to 30 years (75.4%) with the majority being in the age group of 21 to 25 years (30.6%). Among these subjects, 91 were Muslim (49.7%), 52 (28.4%) were Hindus and 40 (21.8%) were Christian by religion; 42 of these subjects (22.9%) had received primary education, while 101 (55.1%) and 30 (16.4%) had received secondary and tertiary education respectively.

Reason	Frequency	Percentage
Assess foetal well-being	52	28.4%
Check foetal presentation	21	11.5%
Confirm pregnancy	42	22.9%
Estimate gestational age	22	12%
Estimate foetal weight	9	4.9%
Sex determination (As told by subjects)	11	6%
Exclude foetal abnormalities	20	10.9%
Do not know	6	3.3%
Others	0	0%

**Table 2. Reason for First Scan**

The majority of the subjects included in the study underwent their first antenatal scan in view of assessing foetal well-being (28.4%) and confirming the pregnancy (22.9%). About 6% of the subjects made a mention for foetal sex determination and were educated that foetal sex determination was illegal in India. These subjects were unaware of the fact that foetal sex determination was not allowed in India by law.

Reason	Frequency	Percentage
Doctor's referral	119	65%
Relative's advice	16	8.7%
Friend's advice	17	9.2%
Experience from earlier pregnancy	31	16.9%
Others	Nil	0%

**Table 3. Referral for First Scan**

Among the 183 subjects included in the study 119 subjects (65%) underwent their first scan following the doctor's referral, while 31 subjects (16.9 %) did so due to their prior experience during previous pregnancies. Very few subjects got their first scan by friends and relative's advice. By this we found that the subjects in coastal Karnataka had a very good access to health care.

Month of 1 <sup>st</sup> Scan	Frequency	Percentage
2 <sup>nd</sup> Month	53	28.9%
3 <sup>rd</sup> Month	79	43.1%
4 <sup>th</sup> Month	39	21.3%
5 <sup>th</sup> Month	10	5.4%
6 <sup>th</sup> Month	2	1.1%
7 <sup>th</sup> Month	Nil	-
8 <sup>th</sup> Month	Nil	-
9 <sup>th</sup> Month	Nil	-

**Table 4. Month during which First Antenatal Scan was Performed**

Number of USG	Frequency	Percentage
1	Nil	-
2	14	7.6%
3	49	26.3%
4	89	48.6%
>/= 5	31	16.9%

**Table 5. Total Number of Ultrasounds Performed during Pregnancy**

48.6% of the subjects included in the study had undergone 4 antenatal scans, while 26.3% underwent a total of 3 antenatal scans during their pregnancy; 7.6% of the subjects had only undergone 2 antenatal scans. On an average most of the subjects had three-to-four antenatal visits, which is according to the national guidelines.<sup>7</sup>

19 subjects (10.4%) felt that performing ultrasounds in pregnancy were harmful for the foetus, while 11 subjects (6%) were of the ideology that performing multiple obstetric scans was a waste of money.

142 subjects (77.5%) included in the study got a majority of their scans done in a Private Hospital or Clinic as it was convenient for them, while 41 subjects (22.4 %) got it done in a Government Hospital. Most of them opted for a Private Hospital or Clinic, as it saved their time due to lesser waiting periods and shorter travel time. The subjects who opted for a Government Hospital in a few of their antenatal ultrasound visits did so just to save money.

Overall Subject Experience	Frequency	Percentage
Satisfied	102	55.7%
Average experience	52	28.4%
Unsatisfied	29	15%

**Table 6. Overall Subject Experience**

102 subjects (55.7%) were satisfied with their overall experience during the antenatal scan, while 52 subjects (28.4%) rated it an average experience; 29 subjects (15%) were left dissatisfied with their experiences during their antenatal scans.

Reason	Frequency	Percentage
Prolonged waiting period	37	20.2%
Poor communication with radiologist	28	15.3%
Poor communication with nursing staff	38	20.7%
Prolonged time for receiving the report	39	21.3%
Preference for female radiologist	49	26.7%
Cost of ultrasound	20	10.8%

**Table 7. Factors Contributing to Subject Dissatisfaction Towards Antenatal Scans**

(Please note that the percentages do not add up to 100%, as this table includes suggestions from patients who were both satisfied and unsatisfied with their scan experiences).

The reasons contributing towards subject dissatisfaction included prolonged waiting periods for the scan (1 - 2 hours in 27 cases and > 2 hours in 10 cases), poor communication between the radiologist, nursing staff and the subject and prolonged time taken to receive the report (> 1 hour in 32 subjects).

Preference for Female Radiologist	Frequency	Percentage
Prefer female radiologist	49	26.7%
Does not matter	134	73.3%

**Table 8. Preference for Female Radiologist**

49 subjects (26.7%) revealed that they were uncomfortable due to the gender of the radiologist and expressed the preference for a female radiologist.

## DISCUSSION

Ultrasound presently occupies a very important role in antenatal care, both as a screening procedure and also to aid the obstetrician to make decisions related to subject management.<sup>3</sup> The majority of the subjects underwent > 3 antenatal scans, which meets the present national guidelines thereby showing a good awareness among the clinicians as most of the subjects underwent the scan following referrals from the obstetrician.<sup>9</sup> This also indicates a good literacy level among subjects and availability of primary healthcare.

Most of the subjects (43.1%) underwent their first scan by the third month of gestation. However, it is also worth noting that 27.8% of the subjects underwent their first antenatal scan only by the fourth month. This is rather late compared to a mean of 11 weeks reported in Denmark and 14.3 weeks in Nottingham (UK).<sup>9</sup> This highlights a need to educate the subjects and healthcare providers on the importance of the first trimester scan in order to take the presently prevailing antenatal care standards to the next level.

About 85% of the subjects were satisfied with their experiences during antenatal scans. On the other hand, 15% were dissatisfied with their antenatal scans.

Major reasons for the unsatisfactory scans included prolonged waiting period, poor communication with radiologist, poor communication with nursing staff, prolonged time for receiving reports, preference for female radiologist and cost of ultrasound.

It was seen that 26.7% expressed a preference for a female radiologist. This could be possibly attributed to the prevailing cultural and social norms in the study population. One of the main reasons behind the prolonged waiting periods and poor communication with the subjects could be a high subject load, which does not allow the radiologist and the nurses to adequately communicate with the subject. In view of this, the concerned authorities should ensure the provision of adequate radiologists and ultrasound machines to meet the subject load of the hospital and address the subject concerns. Further, a provision for a female radiologist should also be made so that subjects requesting for the same may feel satisfied. Subjects should also be encouraged to express their concerns regarding the pregnancy to the health care providers for improving the overall experience of the antenatal visit.

The limitations of this study include a relatively small sample size, which could possibly introduce some bias in the findings. Furthermore, the findings reflect the perception of one section of the society as only a minority of the subjects had received tertiary education. It should also be taken into consideration that since only women with live babies were included in the study, their negative experiences may have been under-reported due to their delight over the good outcomes of their pregnancies.

In view of this, the concerned authorities should ensure the provision of adequate radiologists and ultrasound machines to meet the subject load of the hospital and address the subject concerns.

Further, a provision for a female radiologist should also be made so that subjects requesting for the same may feel satisfied.

Subjects should also be encouraged to express their concerns regarding the pregnancy to the healthcare providers for improving the overall experience of the antenatal visit.

## CONCLUSION

Majority of subjects were aware of the benefits of antenatal ultrasound. However, more subject education needs to be done about the benefits of first trimester ultrasound and the need for the same. Main reasons for subject dissatisfaction included prolonged waiting periods, poor communication and preference for a female radiologist. Efforts need to be initiated towards addressing the same as improved subject experience may encourage them to get their subsequent scans regularly and also help reduce subject anxiety.

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