

**ORIGINAL RESEARCH**

# A study to assess baseline patterns of obstetric sonography referrals and their indications in pregnant women attending the tertiary care Centre, South India

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**ABSTRACT**

Aim of this study is to assess the baseline pattern of obstetric sonography referrals, indications and findings at Tertiary care hospital. **Methods:** Hospital based prospective study which was conducted in the Department of Obstetrics & Gynaecology, for a period of 6 months, after taking the approval of the protocol review committee and institutional ethics committee. A total of 100 cases were referred to the higher centre due to various reasons. **Results:** 65 (65%) of the cases in this study were 20-30 years old. The majority of referrals were primigravida 48 (48%). Out of 100 referred patients, 90 delivered and 5% were conservatively treated. In 5 patients (5%) abortion, medical termination, ectopic pregnancy, or tears were managed according to procedure based on gestational age upon diagnosis. Of the 90 babies delivered at our institute, 63 (70%) were delivered naturally and 27 (30%) via caesarean section. Early membrane rupture (17%) was the leading cause of referral in this study. Pre-eclampsia (16%) and meconium-stained liquor (10%) follow. Previous caesarean sections referred 5% of cases. In this study, 6% of cases were referred due to blood and doctor shortages. Our hospital received 64%, 24%, and 12% of cases during intrapartum, antepartum, and postpartum. **Conclusion:** We conclude that prompt referral is essential for maternal and fetal success. Health care providers should be taught in essential and emergency obstetric care to prevent morbidity, mortality and eliminate unnecessary referrals which increase the tertiary care hospital burden.

**Key words:** Baseline pattern, findings, indications, obstetric sonography, referrals

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**INTRODUCTION**

In the field of obstetrics and gynecology, ultrasonography has become an essential tool.<sup>1-3</sup> It is commonly known as the obstetrician's third eye. Since its popularization by Ian Donald at Glasgow in the 1950s, ultrasonography has actually brought about a tremendous shift in clinical practice. Ultrasonography has become an integral part of the care of almost all obstetric problems nowadays. A minimum of one ultrasound scan is considered essential by many pregnant mothers. The routine use of ultrasound scans, however, has been controversial for some time and continues to be so today.<sup>4,5</sup> Pregnant women choose to get scans for a variety of reasons, some of which may not be immediately apparent to their

doctors, despite the ongoing discussion about whether or not clinicians should order them.<sup>4</sup>

Every year, in India, women lose their lives.<sup>6,7</sup> 6.7% of all maternal fatalities globally are attributable to this.<sup>8</sup> Health care for women before, during, and after childbirth is essential in preventing maternal fatalities and injuries; according to one estimate, for every maternal fatality, fifteen percent of pregnancies experience complications requiring tertiary obstetric care.<sup>8</sup> Certainly, healthcare for mothers and children has improved since the turn of the millennium, but there are still gaps in several states; Kerala has excelled in this area the most, while Uttar Pradesh has suffered the most.<sup>9,10</sup> In order to reduce the risk of complications for both the mother and the baby,

emergency obstetric transfers should be performed quickly and carefully. What we call a "institution referral" happens when a pregnant woman goes to one level of care (basic emergency obstetric care) and then is sent to another level (comprehensive emergency obstetric care). Ever before primary healthcare emerged, referral networks have been regarded as a crucial part of emerging nations' health systems. The worldwide incidence of maternal mortality, the large number of specialists who assist a woman during her pregnancy and delivery, and the urgency with which intervention is frequently required make referral a particularly crucial component of obstetrics.<sup>11</sup> If women could be referred to existing emergency obstetric care more quickly, the World Health Organization estimates that between eighty-eight and ninety-eight percent of maternal deaths may be prevented. Improving support (particularly transportation), raising community awareness, establishing feedback mechanisms, and establishing referral protocols are all necessary for a healthy referral system.<sup>12</sup> The seriously ill patients are often referred late, in moribund situations with multiple organ damage, because of a lack of awareness and frequent antenatal care. The final result for patients is greatly affected by how quickly and appropriately they are referred.<sup>13</sup> An essential aspect of maternity and child health services is referral services, which help identify and send pregnant women who are at high risk to appropriate care. It is still a weak point in the health systems of most developing nations.<sup>14</sup> While it is impossible to predict the occurrence of most obstetric complications-acute conditions like postpartum hemorrhage, sepsis, eclampsia, and obstructed labor-the vast majority of these complications can be managed with the prompt administration of an evidence-based intervention package called emergency obstetric care.<sup>15-17</sup> Examining the referral, indication, and baseline patterns of obstetric sonography at a tertiary care hospital was the primary goal of this study.

## MATERIALS AND METHODS

Hospital based prospective study which is conducted in the Department of Obstetrics & Gynaecology at Victoria General Hospital, Visakhapatnam over a period of 6 months. Prior approval of the protocol review committee and institutional ethics committee was obtained. 100 cases which were randomly selected were included in this study which are referred to this tertiary care centre due to various reasons. Copy of all referral slips had been preserved. These referral slips have been studied retrospectively.

Using a pre structured designed questionnaire, socio demographic details, medical co-morbidities, indications for referral were obtained. Referral slips were analyzed and source of referral, distance travelled and mode of transport and referral-arrival interval, documentation patterns were sought. Patient referred while in labour were also noted. Gestational age at referral and mode of delivery was highlighted. Intra partum variables and surgical morbidities were evaluated. To know perinatal outcome, APGAR score was noted, if needed NICU admission cause for it was noted. Inclusion criteria: 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: No previous medical records and incomplete records without the desired information, or use of non-standardized abbreviations. All radiological records, which were not for obstetric scans were also excluded.

The data obtained was entered into a spreadsheet and analyzed using statistical package for social science (SPSS) version 22 software (IBM Inc., Chicago, Illinois, USA 2015) and Microsoft Excel 2007. Chi square was used as a test of statistics and the statistical significance using a p value < 0.05.

## RESULTS

**Table 1: Details of Study participants General and obstetric information**

Age years	N=100	%
Below 20	4	4
20-30	65	65
30-40	25	25
Above 40	6	6
<b>Parity</b>		
Primigravida	48	48
Multigravida	43	43
Grand multigravida	9	9
<b>Outcome of ANC</b>		
Delivered	90	90
Abortion /ectopic	5	5
Conservative	5	5

Mode of Delivery N=90		
Normal Delivery	63	70
LSCS	27	30

Maximum number of cases in present study were in the age group of 20-30 years comprising 65 (65%) of total cases. Majority of the referral cases were primigravida 48 (48%). Out of 100 referred cases, 90 (90%) delivered, 5 (5%) were treated conservatively. In 5 patients (5%) either abortion occurred or medical termination of pregnancy was done or there was

ectopic pregnancy or tears which were managed according to set protocol depending upon the gestational age at diagnosis. Out of the 90 cases who delivered at our institute majority of the babies were delivered 63 (70%) delivered normally, while 27 (30%) underwent caesarean section.

**Table 2: Reasons for delivered babies NICU Admission among the study Participants**

Reason for admission	No. of cases=20	%
Preterm care	6	30
Meconium aspiration syndrome	4	20
Jaundice	3	15
Sepsis	3	15
Transient tachypnoea of newborn	1	5
Low birth weight	1	5
Asphyxia+ death	1	5
Hypoglycemia	1	5

Out of 90 deliveries, there were 20 NICU admissions and 70 were healthy babies. Reasons for admission were varied.

**Table 3: Indications for referrals among the study participants**

Parameter	N=100	Percentage
Preterm Labour	8	8
PROM	17	17
Pre-eclampsia and related condition	16	16
Cardiac disease	2	2
Crossed dates	5	5
Prev LSCS	5	5
Antepartum hemorrhage	5	5
Postpartum hemorrhage	5	5
MSAF	10	10
Malpresentation	3	3
Non availability of blood	3	3
Non availability of doctor	3	3
No details	3	3
Ectopic	1	1
Short stature	2	2
Anaemia	5	5
Fetal distress	7	7

In the present study, premature rupture of membranes was the most common cause of referral (17%). This is followed by pre-eclampsia and related conditions (16%), and meconium stained liquor (10%). Previous

caesarean sections were the cause of referral in 5% of cases. In the present study, 6% of cases were referred due to non-availability of blood and doctors.

**Table 4: Most common period of referrals among the study participants**

Period of pregnancy	No. of cases=100	%
Intrapartum	64	64
Antenatal	24	24
Postpartum	12	12

64%, 24%, 12% of the cases were referred to our hospital in their intrapartum, antepartum and postpartum period respectively.

## DISCUSSION

The most reliable method for detecting a pregnancy in its early to late stages is obstetric (prenatal) ultrasonography.<sup>18</sup> Ever since its introduction in the 1950s, prenatal sonography has completely transformed the field of obstetrics by providing a safe, accurate, and non-invasive way to examine the fetus and its intrauterine environment.<sup>19</sup> The number of pregnancies that have had four or more ultrasounds during the second or third trimester is also on the rise, and the technology is now utilized to evaluate 40-60% of pregnancies.<sup>20,21</sup>

Cases involving participants aged 20-30 made up the bulk of this study, accounting for 65 (or 65%) of all cases. The vast majority of respondents (74%), according to Morsheda Banu et al.'s analysis of the whole age distribution, were between the 20-35-year-old bracket.<sup>22</sup> The majority of patients in the study by Prakriti Goswami et al. were between the ages of 20 and 30, making approximately 78% of the total.<sup>23</sup> The majority of the cases referred were first-time mothers (48 out of 102). Both Gupta PR et al.<sup>24</sup> and Prakriti Goswami et al.<sup>23</sup> observed that 52.17 and 47.0% of the patients, respectively, were first-time mothers. Our hospital received referrals for 64 percent of patients during the intrapartum period, 24 percent during the antepartum era, and 12 percent during the postpartum period. The findings of Devinneni K. et al. in their "Study of spectrum of referral pattern at a tertiary teaching hospital toward better obstetric care" are similar to those of Prakriti Goswami et al., where 56% of cases were referred intrapartum, 30% during the antepartum interval, and 14% after the birth, respectively.<sup>25</sup>

Of the 90 mothers who gave birth at our facility, 63 (or 70%) had a natural delivery and 27 (or 30%) had a cesarean section. Findings showed that the current study's caesarean section rates were comparable to those of Goswami et al. (28%).<sup>23</sup> The most common reason for referral (17%) in this study was premature membrane rupture. Next on the list is pre-eclampsia and its associated disorders (16%), followed by meconium-tinged liquid (10%). Consistent with previous studies, 5% of cases were referred due to prior caesarean sections. This finding is in line with those of Goswami P et al. (6%), Khatoun A et al. (15%), and Gupta PR et al. (7.62%).<sup>24</sup> Because of a lack of an operating room, gynaecologists, anesthesiologists, qualified personnel, or basic infrastructure, PHCs and CHCs send patients who have had previous caesarean sections to higher centers. The current analysis found that 6% of cases were referred because blood and doctors were not available. A total of 70 babies were born healthily, while 20 were admitted to the neonatal intensive care unit. Admission was granted for a variety of reasons. These findings are in line with those of the study by Poornima M et al., which also indicated that 47% of NICU hospitalizations were for preterm care and 28%

for respiratory distress.<sup>27</sup> Due to the high number of NICU admissions, premature birth is a major concern.

## CONCLUSION

Our study observed and we conclude that a positive outcome of pregnancy for both the mother and the foetus depends on prompt referral. Healthcare providers should undergo training in emergency and essential obstetric care in order to lessen the number of needless referrals and to decrease the burden on tertiary care facilities. This training will also aid in reducing maternal morbidity and mortality. One of the most common and important reasons for referring high-risk obstetric cases to a tertiary care center is for hypertensive disorders of pregnancy.

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