Original research article

A retrospective observational assessment of the baseline pattern of obstetric sonography referrals, indications and findings at tertiary care facility

[1]Ramesh Chandra Adurti, [2]Dr. Priyanka Adurthy, [3]Dr. Supraja Jonnalagadda

[1]Associate Professor, Department of Radiology, Mamata Medical College, Khammam, Telangana, India
[2]Assistant Professor, Department of Radiology Government Medical College, Suryapet, Telangana, India
[3]Assistant Professor, Department of General Surgery, Kamineni Institute of Medical Sciences, Narketpally, Telangana, India

Corresponding Author:
Dr. Ramesh Chandra Adurti (mamatakhmm@gmail.com)

 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.
Methods: A prospective study was conducted for the period of 1 year, 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: 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. 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. 64%, 24%, 12% of the cases were referred to our hospital in their intrapartum, antepartum and postpartum period respectively.
Conclusion: Childbirth is a normal physiologic process, but emergencies can arise anytime. The present study has shown that improper antenatal and intranatal care at the periphery level is responsible for poor maternal and perinatal outcome. We concluded that the timely referral is crucial for a satisfactory maternal and fetal outcome. To reduce the number of unnecessary referrals and to reduce burden on tertiary care hospitals, health care workers should be trained in essential and emergency obstetric care which will help in reducing morbidity and mortality.
Keywords: Baseline pattern, findings, indications, obstetric sonography, referrals

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].

Women die every year in India [6, 7] which contribute 20-25% of all maternal deaths in the world [8]. One estimate shows that with one maternal death, 15% pregnancies develop complication which necessitates tertiary obstetric care and the vast majority of maternal deaths and injuries are avoidable when women have access to health care before, during and after childbirth [8]. Of course there is improvement in maternal and child healthcare after the millennium declaration 2000, but there are lacuna across different states, Kerala being the most outstanding and Uttar Pradesh the worst performer [9, 10]. Emergency obstetric transfers should be carried out effectively and efficiently to avoid maternal and foetal morbidity and mortality. An institution referral is when a pregnant woman seeks care at a lower-level health facility

316

(basic emergency obstetric care) and is referred onwards to a higher level health facility (comprehensive emergency obstetric care). Referral systems have been considered to be an important component of health systems in developing countries since the emergence of primary healthcare. Referral is especially important within obstetrics due to the high numbers of professionals who support a woman through pregnancy and birth, the speed with which action often needs to be taken and the global burden of maternal mortality [11]. The World Health Organization estimates that at least 88-98% of maternal deaths can be averted with timely access to existing, emergency obstetric care using effective and efficient referral systems. A good and well sustained referral system needs referral-protocols, improved support (especially transportation), community awareness and feedback system [12]. Due to lack of awareness and absence of regular antenatal care, the critically ill patients are referred late and sometimes in moribund conditions with multiple organ damage. Timeliness and appropriateness of referral is an important factor in the ultimate outcome of the patients [13]. Referral services for identification and referral of high risk pregnancies are an integral part of maternal and child health services. For a large majority of developing countries this aspect of health system remains weak [14]. Although most obstetric complications (defined as acute conditions such as postpartum haemorrhage, sepsis, eclampsia and obstructed labor that can cause maternal death cannot be predicted, the majority can be treated with timely provision of a package of evidence-based interventions known as emergency obstetric care (EmOC) [15-17].

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

Materials and Methods

A prospective study was conducted for the period of 1 year, 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. 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 maternal and foetal were obtained. Referral slips were analysed and source of referral, distance travelled and mode of transport and referral-arrival interval, documentation patterns were sought. Patient referred while in labour were 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 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 trans abdominal 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: Patient details

Age years	N=100	%
Below20	4	4
20-30	65	65
30-40	25	25
Above40	6	6
Parity		
Primigravida	48	48
Multigravida	43	43
Grand multigravida	9	9
Outcome of ANC		
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 NICU Admission

Reason for admission	No. of cases = 20	%
Preterm care	6	30
Meconium aspiration syndrome	4	20
Jaundice	3	15
Sepsis	3	15
Transient tachypnea of newborn	1	5
Low Birth Weight	1	5
Asphyxia + death	1	5
Hypoglycaemia	1	5

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

Table 3: Causes of referral

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 during which patients were referred

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 intapartum, antepartum and postpartum period respectively.

Discussion

Obstetric (prenatal) ultrasonography has become the gold standard for the diagnosis of early to late trimester pregnancy [18]. 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 [19]. 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 [20, 21].

Maximum number of cases in present study were in the age group of 20-30 years comprising 65 (65%) of total cases. Morsheda Banu *et al*. on assessing the overall age distribution found that the majority (74%) of the respondents were between 20-35 years [22]. In the study conducted by Prakriti Goswami *et al*., the maximum number of patients were in the age group of 20-30 years (78%) [23]. Majority of the referral cases were primigravida 48 (48%). Gupta PR *et al*. [24] found 52.17% patients were primigravida, Prakriti Goswami *et al*. [23] found 47% patients were primigravida. 64%, 24%, 12% of the cases were referred to our hospital in their intapartum, antepartum and postpartum period respectively. Similar results are found by Prakriti Goswami *et al*. where 56%, 30% and 14% of cases were referred in intrapartum, antepartum, postpartum period respectively [23] and also by Devinneni K *et al*., in their "Study of spectrum of referral pattern at a tertiary teaching hospital toward better obstetric care" [25].

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. The caesarean section rates in the present study was found to be similar to the study conducted by Goswami *et al*. (28%) [23]. 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 which was similar to the study conducted by Goswami P *et al*. (6%) [23], Khatoon A *et al*. (15%) [26] and Gupta PR *et al*. (7.62%) [24]. The patients with previous caesarean section are referred to higher centres from PHC/CHC due the unavailability of operation theatre, gynaecologist, anaesthesiologists, trained staff or basic infrastructure deficit. In the present study, 6% of cases were referred due to non-availability of blood and doctors. Out of 90 deliveries, there were 20 NICU admissions and 70 were healthy babies. Reasons for admission were varied. These results are similar to the findings found in the study conducted by Poornima M *et al*. where 47% of NICU admissions were for preterm care, 28% for respiratory distress [27]. The high rate of NICU admission is due to preterm delivery.

Conclusion

Childbirth is a normal physiologic process, but emergencies can arise anytime. The present study has shown that improper antenatal and intranatal care at the periphery level is responsible for poor maternal and perinatal outcome. We concluded that the timely referral is crucial for a satisfactory maternal and fetal outcome. To reduce the number of unnecessary referrals and to reduce burden on tertiary care hospitals, health care workers should be trained in essential and emergency obstetric care which will help in reducing morbidity and mortality. Hypertensive disorders of pregnancy have been one of the commonest causes of referral among high risk obstetric patients which can be better dealt at the tertiary care centre. Health care workers should be provided with the checklist prior to referral.

References

1. Oche OM, Umar AS, Raji MO, Kaoje AU, Godwin G, Ango JT, *et al*. Knowledge of the use and indications for obstetric ultrasound scan among women attending a main referral hospital, Sokoto, Nigeria. Res Obstet Gynecol. 2013;2(5):55-62.
2. Edvardsson K, Graner S, Thi LP, Åhman A, Small R, Lalos A, *et al*. 'Women think pregnancy management means obstetric ultrasound': Vietnamese obstetricians' views on the use of ultrasound during pregnancy. Global health action. 2015 Dec;8(1):28-405.
3. Filly RA, Crane JP. Routine obstetric sonography. J Ultrasound Med. 2002;21:713-718.
4. Enakpene CA, Morhason-Bello IO, Marinho AO, Adedokun BO, Kalejaiye AO, Sogo K, *et al*. Clients' reasons for prenatal ultrasonography in Ibadan, South West of Nigeria. BMC women's health. 2009 Dec;9(1):1-8.
5. Ikeako LC, Ezegwui HU, Onwudiwe E, Enwereji JO. Attitude of expectant mothers on the use of ultrasound in pregnancy in a tertiary institution in South East of Nigeria. Annals of Medical and Health Sciences Research. 2014;4(6):949-53.
6. National Family Health Survey (NFHS-2) 1998-99. Bombay: International Institute of Population Services. 2000;196:247-51.
7. National Family Health Survey (NFHS-3) 2005-2006. Bombay: International Institute of Population Services. 2006;196:247-51.
8. Pal A. Review of changing trends in maternal mortality in a rural medical college in West Bengal. J Obstet. Gynaecol. India. 2005;55:521-8.
9. Mohapatra A, Gomare M. A critical appraisal of the maternal and child health scenario in a metropolitan city in India with reference to achievements of millennium development goals. Journal of Family Medicine and Primary Care. 2019 Mar;8(3):995.
10. Selected socioeconomic statics of India; c2017.
11. World Health Organisation, UNICEF, UNFPA, World Bank, UN Population Division. Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, the World Bank and the United Nations Population Division. Geneva: World Health Organisation; c2014.

12. Stefanini A. District hospitals and strengthening referral systems in developing countries. World hospitals and health services: World Hosp Health Serv. 1994;30:14-9.

13. Gupta PR, Chaudhari SN, Gonnade NV. Maternal and fetal outcome in referred patients to tertiary care centre, Sch J App Med Sci. 2016;4(5C):1624-31.

14. Park K. Textbook of Social and Preventive Medicine 17th ed. Jabalpur. Banarasidas Bhanot Publishers, 2000, 632.

15. Koblinsky M, Chowdhury ME, Moran A, Ronsmans C. Maternal morbidity and disability and their consequences: neglected agenda in maternal health. J Health Popul Nutr. 2012;30(2):124-30.

16. Lee AC, Lawn JE, Cousens S, Kumar V, Osrin D, Bhutta ZA. Linking families and facilities for care at birth: what works to avert intrapartum-related deaths? Int. J Gynaecol. Obstet. 2009;107(1):S65-85.

17. World Health Organisation. Monitoringthe Building Blocks of Health Systems: A Handbook of Indicators and their Measurement Strategies. Geneva: WHO, 2010.

18. Sidi M, Abubakar Y. Ultrasound scanning pattern of findings among pregnant women undergoing obstetric scan in Aminu Kano Teaching Hospital, Nigeria. Dutse J Pure Appl. Sci. 2020;6(1):17-26.

19. Joseph D, Moi A, Shem S, Malgwi F, Umar M, Ameh PO, et al. Pattern of Obstetrics Sonographic Requests and Findings in a Referral Hospital in North Eastern Nigeria. Nigerian Journal of Scientific Research. 2017 Nov;16(6):769-72.

20. You JJ, Alter DA, Stukel TA, McDonald SD, Laupacis A, Liu Y, et al. Proliferation of prenatal ultrasonography. Cmaj. 2010 Feb;182(2):143-51.

21. Eze CU, Okaro AO, Ohagwu CC. Pattern of prenatal ultrasound requests and findings in Enugu, South East, Nigeria. Eur. J Sci. Res. 2009;34(3):290-296.

22. Banu M, Nahar S, Nasreen H. Assessing the MANOSHI referral system-addressing delays in seeking emergency obstetric care in Dhaka's slums. Manoshi-WP10. 2010;1:36.

23. Goswami P, Bindal J, Chug N. To study pattern of obstetric cases referred at tertiary care centre in Central India. Int. J Reprod Contracept Obstet Gynecol. 2017 Jun;6(6):2370-4.

24. Gupta PR, Chaudhary SN, Gonnade NV. Maternal and fetal outcome in referred patients to tertiary care centre Such J App Med Sci. 2016;4(5C):1624-63.

25. Devineni K, Sodumu N. A study of spectrum of referral pattern at a tertiary teaching hospital towards better obstetric care. IAIM. 2016;3(8):193-198.

26. Khatoon A, Hasny SF, Irshad S, Ansari J. An audit of obstetric referrals to Abbasi Shaheed Hospital. Pak J Surg. 2011;27(4):304-8.

27. Poornima M, Rekha G Daver. Maternal and Fetal Outcome in Obstetric Referred Cases. Glob J Res Analys. 2018;7(2):544-7.