Original Research Article

Status of antenatal care in various health care facilities and referral scenario in Sultania Zanana Hospital, Bhopal, and its impact on maternal and fetal outcome

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Received: 13-01-2021 / Revised: 09-03-2021 / Accepted: 08-04-2021

Abstract

Objective : This study was planned to study the referral of patients from inside and outside Bhopal, which are either referred due to lack of skilled staff or facilities for essential and EOC.**Methods:**This prospective observational study was conducted in 700 consecutive patients who attended Department of Obstetrics and Gynaecology, Gandhi Medical College and associated Sultania Zanana Hospital, Bhopal, MP, India, from 1st January 2017 to 30th June 2019.**Results:** Out of total patients included, majority of referrals were from Districts outside of Bhopal (62.6%) whereas only 37.4% referred patients were from Bhopal Districts. Overall, majority of patients referred belonged to the age group of 21 to 30 years (76.6%) and there was not significant(p value 0.41) correlation between inside and outside referrals. Ambulance facility was utilized by only 13.3% patients referred from inside and 20.5% patients from outside Bhopal and utilization of ambulance services outside of Bhopal District was statistically significant($p<0.05$). **Conclusion:** Maximum referrals reported during third trimester i.e. 58.4% and 79.2% from inside and outside Bhopal respectively and there was statistically significant correlation(p value 0.01) Antenatal care outcome at tertiary health centers can be improved by up-grading health care facilities at various peripheral health care centers.

Keywords: Emergency obstetrics care [EOC], antenatal care [ANC], tertiary health centers

Introduction

Pregnancy and childbirth is a universally celebrated event. Yet for many women this joyful event is associated with various complications which may end in death[1]. Various government and non-government organizations are working for creating awareness and providing facilities regarding antenatal care(ANC) and safe delivery practices. Despite the provision of improved facilities, there is a public health concern about high maternal mortality and perinatal mortality[2]. ANC at ground level is provided by various frontline health workers through primary health centre to detect high risk cases as early as possible. The objective of ANC is to detect high risk cases and refer them to tertiary care centre and arrange for them skilled care. The referral system plays a very crucial role in pregnancy and childbirth for providing access to Emergency Obstetric Care(EOC). Appropriateness and timeliness of referral is an important factor in the ultimate outcome of the patients[3].Despite the provision of good antenatal services and attempt to increase awareness, services are poorly utilized and hence the patients present in late stage with complications which are difficult to manage. This increases the suffering and morbidities of the patients.The present study was conducted at Gandhi Medical College and associated Sultania Zanana Hospital, Bhopal. Being a tertiary care hospital, it caters the patients referred from different parts of Bhopal. Also it caters population of various nearby Districts referred from various private and government institutions. Various Health facilities within Bhopal are supposed to provide EOC; but due to lack of staff or various other reasons, these secondary facilities are not providing basic services and hence there is overutilization of tertiary level facilities including Sultania Zanana Hospital. This is important to address as it has cost implications in resource constrained situations and it may affect the quality of care provided at higher level facility.

Materials and Methods

This prospective observational study was conducted in 700 consecutive patients who attended Department of Obstetrics and Gynaecology, Gandhi Medical College and Associated Sultania Zanana Hospital, Bhopal, MP, India, from 1st January 2017 to 30th June 2019. Patients from almost all the areas of Bhopal and nearby districts (rural as well as urban) are referred for receiving quality care at Sultania Zanana Hospital.

Inclusion criteria: All obstetrics patients referred from various health care facilities from inside and outside Bhopal to Sultania Zanana Hospital.

Exclusion criteria: All unbooked direct obstetrics patients seeking care at Sultania Zanana Hospital.

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Consent: Written consent was obtained from the relatives of patients after explaining them the nature and purpose of the study. They were assured that confidentiality would be strictly maintained. The option to withdraw from the study was always open.

Methodology

Patient arrival time to admission room of Sultania Zanana Hospital was noted.Detailed history was taken from patients/attendants regarding parity, place of referral, time of referral, management at the referring facility including investigation and treatment, type of transport used, possible causes of referral and information on referral letter.Thorough clinical examination done and findings were noted.

Observation Chart

Table 1: Distribution according to Referral

Referral	Frequency (n=700)	Percentage
Outside Bhopal	438	62.6
Inside Bhopal	262	37.4

Table 2: Distribution according to place of referral

Place of Referral	Total (n=700)		Inside Bhopal (n=262)		Outside Bhopal (n=438)	
	n	%	n	%	N	%
PHC	102	14.6	58	22.1	44	10
CHC	180	25.7	79	30.2	101	23.1
Civil Hospital	20	2.9	20	7.6	0	0
District Hospital	343	49	55	21	288	65.8
Medical College	1	0.1	0	0	1	0.2
Private Hospital	8	1.1	4	1.5	4	0.9
IGH	46	6.6	46	17.6	0	0
Total	700	100	262	100	438	100

Table 3: Distribution according to mode of transport

Mode	Total (n=700)		Inside Bhopal (n=262)		Outside Bhopal (n=438)	
	N	%	n	%	N	%
Ambulance	125	17.9	35	13.3	90	20.5
Private vehicle	575	82.1	227	86.6	348	79.5
Total	700	100	262	100	438	100
Chi square-5.26 ; p=0.02						

Table 4: Distribution according to gestational age at referral

Period of referral	Total (n=700)		Inside Bhopal (n=262)		Outside Bhopal (n=438)	
	n	%	n	%	N	%
1st trimester	58	8.3	39	14.9	19	4.3
2nd trimester	23	3.3	9	3.4	14	3.2
3rd trimester	500	71.4	153	58.4	347	79.2
Postpartum	119	17	61	23.3	58	13.2
Total	700	100	262	100	438	100
Chi sq=41.02; p=0.01						

Table 5: Recording of vitals at referring structure

Vitals at previous institution		Total (n=700)		Inside Bhopal (n=262)		Outside Bhopal (n=438)		Chi sq	P value
		n	%	n	%	N	%		
Pulse	Yes	466	66.6	146	55.7	320	73.1	22.13	0.001
	No	234	33.4	116	44.3	118	26.9		
BP	Yes	518	74	168	64.1	350	79.9	21.13	0.001
	No	182	26	94	35.9	88	20.1		
RR	Yes	552	78.9	206	78.6	346	79	0.01	0.91
	No	148	21.1	56	21.4	92	21		
Temp	Yes	552	78.9	206	78.6	346	79	0.01	0.91
	No	148	21.1	56	21.4	92	21		
Total		700	100	262	100	438	100		

Table 6: Investigation conducted at referring structure

Investigation at previous institution		Total (n=700)		Inside Bhopal (n=262)		Outside Bhopal (n=438)		Chi square	P value
		n	%	n	%	N	%		
Hb	Yes	273	39	71	27.1	202	46.1	24.93	0.001
	No	427	61	191	72.9	236	53.9		
Blood group	Yes	201	28.7	59	22.5	142	32.4	7.85	0.005

	No	499	71.3	203	77.5	296	67.6		
BTCT	Yes	3	0.4	3	1.1	0	0	6.29	0.05
	No	697	99.6	259	98.9	438	100		
CBC	Yes	2	0.3	0	0	2	0.5	6.29	0.05
	No	698	99.7	262	100	436	99.5		
HIV	Yes	55	7.9	14	5.3	41	9.4	3.65	0.06
	No	645	92.1	248	94.7	397	90.6		
HBsAg	Yes	60	8.6	17	6.5	43	9.8	2.1	0.13
	No	640	91.4	245	93.5	395	90.2		
VDRL	Yes	57	8.1	14	5.3	43	9.8	4.31	0.04
	No	643	91.9	248	94.7	395	90.2		
RBS	Yes	9	1.3	5	1.9	4	0.9	1.27	0.25
	No	691	98.7	257	98.1	434	99.1		
Urine albumin	Yes	19	2.7	7	2.7	12	2.7	0.13	0.96
	No	681	97.3	255	97.3	426	97.3		

Results

This prospective observational study was conducted in 700 consecutive patients who attended Department of Obstetrics and Gynaecology, Gandhi Medical College and Associated Sultania Zanana Hospital, Bhopal, MP, India. In this study, our findings are as follows:

Majority of referrals were from Districts outside of Bhopal (62.6%) whereas only 37.4% referred patients were from Bhopal districts (as shown in table 1).Maximum referrals are from District Hospital (49%), followed by 25.7% and 14.6% referrals from Community Health Centre(CHC) and Primary Health Centre(PHC) respectively. Majority of referrals from inside of Bhopal were reported from CHC whereas, majority of referrals from outside of Bhopal were from District Hospitals of respective districts (as shown in table 2).

Ambulance facility was utilized by only 13.3% patients referred from inside Bhopal and 20.5% patients from outside Bhopal. Private vehicle was the most common mode of transport utilized by patients referred from both inside as well as outside of Bhopal. The present study observed statistically higher utilization of ambulance services outside of Bhopal District ($p<0.05$) (as shown in table 3).In the present study maximum referrals reported during third trimester i.e. 58.4% and 79.2% from inside and outside Bhopal respectively. This was followed by referral during postpartum period in 23.3% patients from inside Bhopal and 13.2% from outside Bhopal. There statistically significant (p value 0.01) correlation between inside and outside referred patients (as shown in table 4).Recording of vitals such as pulse, BP, respiration and temperature are essential part of examination. Pulse, blood pressure, respiratory rate, and temperature were recorded at 66.6%, 74%, 78.9%, and 78.9% referring structures respectively. Pulse and Blood pressure were recorded in significantly higher number of referring structures from outside of Bhopal as compared to inside Bhopal ($p<0.05$) (as shown in table 5).It was observed that less than half referring units had the patients investigated before being referred. Hemoglobin estimation was conducted at only 27.1% and 46.1% referring centers from inside and outside Bhopal respectively. Blood grouping and CBC was done at only 28.7% and 0.3% referring structures. Hemoglobin estimation, blood grouping, BTCT, CBC and VDRL testing were done in significantly higher number of referring structure outside Bhopal as compared to inside Bhopal ($p<0.05$)(as shown in table 6).

Statistical Analysis: Data was compiled using MS excel 2007 and analysis was done with the help of Epi-Info 7 software. Frequency and percentage were calculated & statistical test (Chi Square) was applied wherever applicable; $p<0.05$ was taken as statistically significant.

Discussion

The present prospective observational study was conducted in Department of Obstetrics and Gynaecology, Sultania Zanana Hospital, Gandhi Medical College, Bhopal with the aim to evaluate the status of antenatal care in various health care facilities and incidence of referral. The study was conducted on 700 referred patients admitted in Sultania Zanana Hospital during the study period. Majority of referrals were from Districts outside of Bhopal (62.6%) whereas only 37.4% referred patients were from Bhopal Districts.The institution of referral in present study was District Hospital in 49% patients, followed by 25.7% from Community Health Centre and 14.6% referrals from primary health centre. Singh S et al (2019) in their study observed practice for screening and managing high risk pregnancy and complications in only 35% and staff at PHC and51% staff at CHC. Also they observed low confidence amongst staff of CHC and PHC for managing complicated pregnancy[4]. Inadequate health staff and inadequate resources might be responsible for high number of referrals from primary and tertiary care centre. However, more complicated cases are referred from District Hospitals. Sabale U et al (2015)observed 17.3% referral rate in their study and majority i.e. 42.4% referrals were made from District Hospital revealing lacunae in the emergency obstetric care given at the district level hospitals[5].In present study, majority of patients referred belonged to the age group of 21 to 30 years (76.6%) followed by less than 20 year of age (15.4%). Maximum referral were reported during third trimester i.e. 58.4% from inside and 79.2% from outside Bhopal; followed by referral during postpartum period in 23.3% patients from inside Bhopal and 13.2% from outside Bhopal. Gupta PR et al (2016) also enrolled maximum numbers of referred cases in the age range of 20-30 years comprising 86.98% of total cases similar to present study[6].Government of India and Madhya Pradesh are running various scheme to promote institutional deliveries which include free transport facilities with the aid of Janani Express. For effectively reducing maternal morbidity and mortality, utilization of services is necessary. In present study, ambulance facility was utilized by only 13.3% patients referred from inside Bhopal and 20.5% patients from outside Bhopal. The present study observed statistically higher utilization of ambulance services in referral cases from Districts outside of Bhopal ($p<0.05$). Gupta PR et al (2016)in their study documented unavailability of ambulance in 69.34% of cases for transport[6].Kujur K et al (2019)in their study reported 15.37% proportions of referral cases and documented unavailability of ambulance in 69.34% of cases for transport[7]. In another study conducted by Akaba GO et al (2018) reported transport by ambulance in only nine (7.3%) patients[8].Recording of vitals such as pulse, BP, respiration and temperature are essential part of examination. The present study observed recording of pulse inn 66.6%, blood pressure in 74%, respiratory rate in 78.9% and temperature in 78.9% referring structures before referring the patients. Pulse and Blood pressure were recorded in significantly higher number of referring structures from outside of Bhopal as compared to inside Bhopal ($p<0.05$) whereas recording of temperature and respiratory rate were statistically similar in referring structure of inside as well as outside of Bhopal ($p>0.05$).

Investigations before referral were conducted at less than half referring structures. Hemoglobin estimation, blood grouping, BTCT, CBC and VDRL testing were done in significantly higher number of referring structure outside Bhopal as compared to inside Bhopal ($p<0.05$). Also the treatment given at referring structure before referring a patient was also poor i.e.10.5% and 9.9% patients referred from outside Bhopal and inside Bhopal respectively were referred following antibiotic dose. Singh S et al (2019) observed sub-optimal knowledge and practice of screening common high-risk conditions and assessing complications in pregnancy amongst staff of PHC and CHC. Also they observed large gaps in knowledge of emergency treatment for obstetric complications in pregnancy and pre-referral first-aid[4]. Goswami P et al (2017)also reported hypertensive disorders (25.4%) were the leading cause of maternal deaths amongst the referred cases. The delay in referral of complicated cases from peripheral health centres, which could be due to lack of adequate transport facilities or trained personnel in PHC/CHC was the contributing factor for adverse maternal outcome[9].Tiwari HC et al (2014) observed weight measurement in 74.9%, abdominal examination in 76.4% and hemoglobin estimation in only 69.6% patients, Height and blood pressure examination in only 60.8% and 66.2% patients respectively at PHC and CHC. Urine examination was done in only 50.2% patients and education regarding complications and danger signs during pregnancy was given in only half of the patients. They documented poor quality of antenatal services at primary and community health centre[10].Appropriate antenatal care improves pregnancy outcomes. Routine antenatal care is provided at primary care facilities in rural India and women at-risk of poor outcomes are referred to advanced centres in cities. The primary care facilities include Sub-health centres, Primary health centres, and Community health centres, in ascending order of level of obstetric care provided. The latter two should provide basic and comprehensive obstetric care, respectively, but they provide only partial services. In such scenario, the management and referrals during pregnancy are less understood. This study assessed rural providers' perspectives on management and referrals of antenatal women with high obstetric risk, or with complications. Asmathunnisa G et al did their study on current scenario and Challenges Rural health in India. [4] Khanam N et al studied quality of maternal and child health in different scenario among rural and urban Maharashtra. Singh S did a knowledge, practice and attitude survey of providers in rural public healthcare in two states of India regarding management and referral for high-risk conditions and complications during the antenatal period.[11-12]Biswas A et al in their qualitative case study in Bangladesh concluded that timely referral saves the lives of mothers and newborns. Prompt and efficient identification, referral of pregnancy related complications and emergencies are key factors to the reduction of maternal and newborn morbidity and mortality. This study reveals that early detection of pregnancy complications by skilled professionals and timely referral to a facility is beneficial in saving the majority of baby's as well as mother's lives in resource-poor teagardens with a considerable access barrier to health facilities.[13] Similar studies by Roberts J et al in Nigeria ,Austin A et al in Addis Ababa, Ethiopia aimed from the perspective of healthcare providers by analyzing three factors: implementation of national referral guidelines, staff training, and staff supervision. It was concluded that dedicated transportation and communication infrastructure, improvements in pre-service and in-service training, and supportive supervision are needed to maximize the effective use of existing human resources and infrastructure, thus increasing access to and the provision of timely, high quality emergency obstetric care .[14,15]

In studies done by Singh S , Jakhar R et al on maternal outcome in referral obstetric cases in a tertiary care centre it was concluded that illiteracy and ignorance of female regarding healthcare requirements and poor infrastructure came out to be a major contributor of poor pregnancy outcome. 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. [14]A study from Southern Karnataka by Nagavarapu S et al enumerated reasons for obstetric referrals from community facilities to a tertiary obstetric facility: Journal of family medicine and primary care. It was seen that referrals frequently occurred after the onset of labour. Data implies that improving obstetric referral protocols will improve the birth experience and reduce the burden on tertiary care facilities and on the women themselves.[15,16]Mestre AM et al worked on organizing hospitals into networks and creating a hierarchical and multiservice model to define location, supply and referrals in planned hospital systems. Health care planners have to make decisions on where to locate and how to organize hospital services, so as to improve the geographic equity of access in the delivery of care while accounting for efficiency and cost issues. What is needed is a model to inform decisions on the location and supply of hospital services, when the decision maker wants to maximize patients' geographical access to a hospital network. The model considers the multiservice structure of hospital production (with hospitals producing inpatient care, emergency care and external consultations) and the costs associated with reorganizing the hospital network. Moreover, it considers the articulation between different hospital services and between hospital units, and the ascendant and descendent flows related to two-way referrals of patients in the hospital hierarchy. The proposed approach differs from previous literature by accounting simultaneously for these issues and provides crucial information for health care planners on referral networks, on hospital catchment areas, on the location and structure of hospital supply as well as on the costs required to improve access. [17]Darmstadt GL et al worked on evidence-based, cost-effective interventions and stressed on how many newborn babies can we save. Reductions in neonatal mortality that exceed 50% can be achieved with an integrated, high-coverage programme of universal outreach and family-community care. Early success in averting neonatal deaths is possible in settings with high mortality and weak health systems through outreach and family-community care, including health education to improve home-care practices, to create demand for skilled care, and to improve care seeking. Simultaneous expansion of clinical care for babies and mothers is essential to achieve the reduction in neonatal deaths needed to meet the Millennium Development Goal for child survival.[18] Bailey PE et al used a GIS to model interventions to strengthen the emergency referral system for maternal and newborn health in Ethiopia. GIS mapping and modeling enable spatial and temporal analyses critical to understanding the population's access to health services and the emergency referral system. The provision of vehicles and communication and the upgrading of health centers to first level referral hospitals are short- and medium-term strategies that can rapidly increase access to lifesaving services.[19]

Conclusion

Antenatal care outcome at tertiary health centers can be improved by up-grading health care facilities at various peripheral health care centers. General population awareness regarding utilization of government approved facilities can improve antenatal care.

What This Study Add to Existing Knowledge

The Indian health system should improve the provision of obstetric care by standardising services at each level of health care and increasing the focus on emergency treatment for complications, appropriate decision-making for referral, and improving referral communication and staff support.

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Conflict of Interest: Nil
Source of support:Nil