JPESON
Journal of Perinatal Society of Nepal

ORIGINAL ARTICLE

Maternal Complications and Perinatal Outcome in The Booked and Unbooked Cases of Pregnancy at Manipal Teaching Hospital

Ruhee Tuladhar, J.S.S. Sharma

Department of Obstetrics and Gynecology, Manipal College of Medical Sciences, Pokhara, Nepal

ISSN: 2976-1050 (Online)
ISSN : 2976-1042 (Print)

Received : 15 Aug, 2022
Accepted : 10 Sep, 2022

Funding Source : None

Conflict of Interest : None

Corresponding Author

Ruhee Tuladhar
Department of Obstetrics and Gynecology
Manipal College of Medical Sciences,
Pokhara, Nepal.
Email: ruheezme@gmail.com

ABSTRACT

Introduction: The use of prenatal care prevents maternal complications and perinatal adverse outcomes by early identification of high risk pregnancies, assessment of growth and well being of the fetus, prompt diagnosis and management of complications, with safe delivery.

Objectives: This study aims at comparing the obstetrical complications and perinatal outcomes in delivered booked and unbooked mothers to determine the correlation of booking status and maternal and perinatal outcome.

Methodology: In this prospective study, 350 patients admitted for delivery at Manipal Teaching Hospital, Pokhara during March 2014 to May 2015 were included. Antenatal complications of the mothers, postnatal complications, neonatal outcome and the mode of delivery were compared amongst the booked and unbooked cases.

Results: There was an increased prevalence of preeclampsia (6.3% in unbooked vs. 1.6% in booked); eclampsia (2.5% in unbooked vs. nil in booked); antepartum haemorrhage (5.06% in unbooked vs. 2.1% in booked); Preterm premature rupture of membrane (5.1% in unbooked vs. 2.1% in booked); Rh-isoimmunization (06% in unbooked vs. nil in booked); Intrauterine growth restriction (5.7% in unbooked vs. 3.6% in booked); and Intrauterine fetal death (7.6% in unbooked vs. 0.5% in booked) in unbooked mothers as compared to booked mothers. The unbooked mothers were prone to postpartum hemorrhage (6.9% vs 2.6% in booked mothers). Assisted breech delivery and ventouse delivery were recorded higher in unbooked cases than in booked case (3.2% vs. 0.5% and 3.8% vs. 3.1% respectively).

Conclusion: The poorer maternal and fetal outcome in unbooked cases in comparison to booked cases can be reduced with the best utilization of the prenatal care.

Keywords: *Antenatal complications, Perinatal outcome, Prenatal care*

INTRODUCTION

Antenatal care or Prenatal care is synonymous to preventive care with the goal of providing regular check-ups that allow doctors or midwives to treat and prevent potential health problems throughout pregnancy and puerperium while promoting healthy lifestyles that benefit both mother and child. In many developing countries, complications of pregnancy and childbirth are the leading causes of maternal and perinatal mortality. The pregnancy

Citation
Tuladhar R, Sharma JSS . Maternal Complications and Perinatal Outcome in the Booked and Unbooked Cases of Pregnancy at Manipal Teaching Hospital.2022;01(01):15-23.

and childbirth complications are closely linked to poor maternal health during pregnancy, lack of care during delivery and lack of newborn care.[1]

It is anticipated that 15% of pregnancies develop complications.[2] About 800 women die from pregnancy- or childbirth-related complications worldwide every day.[3] In 2017, there were an estimated 295,000 maternal deaths globally, yielding a MMR of 211 maternal deaths per

100,000 live births.[4] Globally, the adult lifetime risk of maternal mortality (i.e. the probability that a 15-year-old woman will die eventually from a maternal cause) is 1 in 190 in 2017, where it ranges from 1 in 5,400 in high income countries to 1 in 45 in low income countries.[4] The MMR in developing regions is 14 times higher than in developed regions.[5] Globally, 2.4 million neonates died in the first month of life in 2020, i.e., 6700 newborn deaths every day.[6] Preterm birth, birth asphyxia, infections and birth defects were the causes of neonatal deaths in 2019. [6]

Nepal belongs to the country with the highest maternal and perinatal death record. The maternal mortality rate is estimated as 186 per 100, 000 live births for Nepal in 2017.[4] The neonatal mortality rate of 16.856 per 1000 live births for Nepal according to 2020 estimation.[4] Many deaths at primary health centres are not included in the district health office statistics due to poor medical recording systems. Nepal's health statistics show about 44% of the pregnant women seek at least one antenatal care visit and only 29% of the pregnant women seek 4 antenatal visits during their whole pregnancy period. In Nepal, only 10% of women receive proper antenatal care.[7] About 19% of total deliveries are only attended by skilled health personnel according to 2011 survey.[8] Many deliveries are home deliveries without trained and skilled birth attendants. Many delivery practices are being conducted in unhygienic conditions. Inadequate clothing for mothers and babies has resulted in neonatal deaths from hypothermia. Poor obstetrical and perinatal outcomes are highly associated with non-utilization of antenatal and delivery care services in unbooked than in booked cases.

With this background, this study was planned to explore the differences in maternal and perinatal outcomes among the booked and unbooked cases to elucidate the underutilization of health care services and to emphasize the need of proper antenatal care to surpass the poor maternal and perinatal mortality rate.

METHODOLOGY

This was a cross-sectional descriptive study done in Department of Obstetrics and Gynecology of Manipal Teaching Hospital from January 2014 to June 2015. All the pregnant mothers after 28 weeks of gestation, attending the labor ward of Obstetric and Gynecology Department of Manipal Teaching hospital for delivery were enrolled in the study after their consent. Women who did not consent, women with multiple pregnancy and who delivered else where and presented with third stage or postpartum complications were excluded from the study.

The study population was divided into two groups according to the booking status. The booked cases were defined as those who hadat least four antenatal care visits while the unbooked cases were defined as those who had not taken antenatal care throughout her pregnancy, or those who had less than four antenatal care visits.

The women in the study group were interviewed on admission using a structured questionnaire and then they were followed up until they were discharged. A detailed history was taken from each patient that included age, marital status, educational qualifications, parity,and significant clinical events in the previous pregnancy, chronic medical illness that can affect maternal and foetal outcome such as diabetes, hypertension and anemia.

Antenatal complications such as anemia, pregnancy induced hypertension, antepartum haemorrhage, IUGR, IUfD, PROM, PPROM, ruptured uterus, and postnatal complications like postpartum haemorrhage, maternal mortality and mode of delivery were assessed between booked and unbooked groups. The neonatal outcome included low birth weight, APGAR score, NICU admission, intravenous antibiotics usage, neonatal sepsis, neonatal mortality between booked and unbooked mothers. The patients were also asked about the reasons for not booking or for declining antenatal care to determine the factors for unattending the antenatal care.

During the study period, 350 cases who fulfilled the inclusion criteria were included in the study.

RESULTS

Out of 350 cases, 192 (54.86%) were booked and 158 (45.14%) were unbooked group. Each case was studied and the data analysis has been described as follows:

Socio-Demographic Profile of Patients

In this study, the youngest patient recorded in booked group was 17 years of age and in unbooked group was 15 years (Table 1). Nine cases in the unbooked group were more than 35 years compared to two cases in the booked group (5.7% vs. 1.0%). The incidence of teenage pregnancy (age group 15-19 years) in the unbooked group was higher than that in the booked group (10.7% unbooked vs. 3.7% booked). The largest number of unbooked patients had attained education up to high school whereas majority of the booked patients are qualified upto intermediate level and post-graduation.

All five illiterate patients were recorded in an unbooked group. It was observed that most of the patients' husbands were semiskilled and unemployed in the unbooked group while the majority of the patients' husbands in the booked group were skilled and well-educated. Maximum number of cases belonged to primigravida in both booked and unbooked groups (Table 1). All three multiparous women were the unbooked cases.

Table 1.Sociodemographic characteristics of booked and unbooked mothers

Maternal variables	Unbooked mothers (n=158)		Booked mothers (n=192)		p-value
	No.	%	No.	%	
Age group (years)					
15-19	17	10.7	14	7.3	0.02
20-24	73	46.2	81	42.1	
25-29	43	27.2	77	40.1	
30-34	16	10.1	18	9.3	
>35	9	5.7	2	1.0	
Education					
• Illiterate	5	3.2	0	0	0.00
• Primary school(<1)	0	0	0	0	
• middle school(1-5)	13	8.2	9	4.7	
• High School(6-10)	99	62.6	74	38.5	
• Intermediate	23	14.6	47	24.5	
• Graduate/PG	18	11.4	62	32.3	
Husband's Occupation					
• Unemployed	16	10.1	11	5.7	0.00
• Semiskilled	54	34.2	52	27.0	
• Skilled	28	17.7	62	32.3	
• Professional	11	7.0	31	16.1	
• Student	3	1.9	9	4.7	
• Abroad(unknown)	46	29.1	27	14.0	
Parity Index					
• Nulliparous	88	55.7	112	58.3	0.15
• 1-3	67	42.4	80	41.7	
• ≥ 4	3	1.9	0	0	

Complications at Delivery

Out of 350 cases in this study, 32.3% of total cases had anemia. Incidence of preeclampsia was more in unbooked group (6.3%) as compared to booked group (1.6%). All four patients of eclampsia were recorded among the unbooked group. Compared with booked patients, unbooked patients had a statistically significant higher incidence of abruptio placentae (3% in unbooked vs. nil in booked); Preterm premature rupture of membrane (5.1% in unbooked vs. 2.1% in booked, p=0.12); Intrauterine growth restriction (5.7% in unbooked vs. 3.6% in booked); and Intrauterine fetal death (7.6% in unbooked vs. 0.5% in booked). A single case of Rh-isoimmunization was recorded in the unbooked group. However, the incidence of Premature rupture of membrane and anemia during pregnancy were diagnosed to be higher in booked group than in unbooked group (Table 2).

Table 2. Incidence of maternal morbidity in antepartum period in booked and unbooked cases at admission at hospital

Maternal variables	Unbooked mothers (n=158)		Booked mothers (n=192)		Total		p-value
	No.	%	No.	%	No.	%	
Anemia	46	29.1	67	34.9	113	32.3	0.25
Pregnancy Induced Hypertension							
	8 10 4 0	5.1 6.3 2.5 0	6 3 0 0	3.1 1.6 0 0	14 13 4 0	4.0 3.7 1.1 0	0.01
Gestational Diabetes Mellitus	1	0.6	2	1.0	3	0.9	0.68
Antepartum Haemorrhage							
	5 3	3.2 1.9	4 0	2.1 0	9 3	2.6 0.9	0.12
PROM	14	8.9	22	11.5	36	10.3	0.42
PPROM	8	5.1	4	2.1	12	3.4	0.12
Rh-isoimmunization	1	0.6	0	0	1	0.3	0.27
Fetal Distress	15	9.5	19	9.9	34	9.7	0.89
Intrauterine growth restriction	9	5.7	7	3.6	16	4.6	0.36
Intrauterine fetal death	12	7.6	1	0.5	13	3.7	0.00

However, when the intrapartum complications were compared between booked and unbooked mothers, no significant differences were obtained. The incidence of nonprogress of labor, prolonged second stage of labor, retained placenta, intrapartum eclampsia and perineal tear were almost equivalent in both the groups. A single case of rupture of uterus was recorded in unbooked group.

In this study, it was seen that unbooked mothers were prone to greater degree of postpartum haemorrhage (6.9% as compared to 2.6% in booked mothers), ICU admission (2.5% as compared to nil among booked mothers) and blood transfusion (6.3% as compared to 4.2% in booked mothers) as shown in Table 3. Postpartum haemorrhage was encountered in five patients (two booked and three unbooked patients) after ventouse delivery, multiparous patients (two booked and three unbooked patients), two unbooked patients with placenta praevia and two unbooked patients with pregnancy induced hypertension. ICU admission was needed for all four unbooked cases among which three patients were referred for eclampsia and one had rupture of uterus.

Table 3. Incidence of postpartum complications in booked and unbooked cases.							
Maternal variables	Unbooked mothers (n=158)		Booked mothers (n=192)		Total		p-value
	No.	%	No.	%	No.	%	
Postpartum Haemorrhage	11	6.9	5	2.6	16	4.6	0.05
Puerperal Sepsis	1	0.6	1	0.5	2	0.6	0.89
ICU Admission	4	2.5	0	0	4	1.1	0.02
Blood Transfusion	10	6.3	8	4.2	18	5.1	0.36
Postpartum Eclampsia	0	0	1	0.5	1	0.3	0.36

Mode of Delivery

In terms of mode of delivery, unbooked mothers were less likely to deliver by spontaneous vaginal delivery compared with booked mothers (41.8% vs.49.5%, respectively). On the other hand, unbooked mothers were thrice as likely as booked mothers to deliver preterm babies (12.0% vs. 4.2%, respectively). Assisted breech delivery and ventouse delivery were recorded higher in unbooked cases than in booked case (3.2% vs. 0.5% and 3.8% vs. 3.1% respectively) as shown in Table 4. However, booked mothers had a greater rate of caesarean section as compared to unbooked mothers (38.6% vs. 42.7% respectively) but the percentage of emergency cesarean section was higher in unbooked cases than in booked cases (85.2% vs. 78.0%). Caesarean hysterectomy was done in one unbooked case due to ruptured uterus and uncontrolled postpartum haemorrhage.

Table 4. Mode of Delivery in booked and unbooked cases							
Mode of Delivery	Unbooked mothers (n=158)		Booked mothers (n=192)		Total		p-value
	No.	%	No.	%	No.	%	
Spontaneous Vaginal Delivery	66	41.8	95	49.5	161	46	0.02
Preterm Delivery	19	12.0	8	4.2	27	7.7	
Assisted Breech Delivery	5	3.2	1	0.5	6	1.7	
Ventouse Delivery	6	3.8	6	3.1	12	3.4	
Cesarean Section	61	38.6	82	42.7	143	40.9	
• Emergency CS	52	85.2	64	78.0			
• Elective CS	9	14.8	18	22.0			
Peripartum or Postpartum Hysterectomy	1	0.6	0	0	1	0.3	

Perinatal Outcome

Among booked and unbooked groups, there were higher stillbirths and early neonatal deaths among unbooked patients as compared to booked group (Table 5). Number of low birth weight neonates was also higher in unbooked group in comparison to babies in booked group. Babies of unbooked mothers were more likely to have asphyxia as compared to booked mothers as indicated by an APGAR score of ≤5 at one minute (19.6% vs.5.2% respectively) and at five minutes (12.7% vs. 2.1% respectively). The number of preterm babies born, the incidence of congenital anomalies and the need of neonatal intensive care unit (NICU) admissions were higher in unbooked mothers as compared to booked mothers. Babies born to unbooked mothers were more likely to need IV antibiotic (17.1% unbooked vs. 12.0% booked).

Table 5. Perinatal morbidity and mortality in booked and unbooked cases					
Perinatal variables	Unbooked mothers (n=158)		Booked mothers (n=192)		p-value
No.	%	No.	%		
Perinatal Outcome					
Live Born	134	84.8	188	98.0	0.00
Fresh Stillbirth	6	3.8	1	0.5	
Macerated Stillbirth	9	5.7	1	0.5	
Early Neonatal Death	9	5.7	2	1.0	
Birth Weight					
Very Low Birth Weight (<1.5Kgs)	13	8.2	1	0.5	0.00
Low Birth Weight (1.5-2.4 Kgs)	38	24.0	23	12.0	
2.5-3.4Kgs	93	58.9	135	70.3	
≥3.5Kgs	14	8.9	33	17.2	
APGAR Score					
At 1min ≤5	31	19.6	10	5.2	0.00
At 5mins ≤5	20	12.7	4	2.1	
Preterm	37	23.4	16	8.3	0.00
NICU Admission	34	21.5	30	15.6	0.15
Congenital Anomaly	9	5.7	3	1.6	0.03
Hyperbilirubinemia	15	9.5	24	12.5	0.37
Neonatal Sepsis	5	3.2	7	3.6	0.8
Meconium Aspiration	2	1.3	5	2.6	0.37
Intravenous Antibiotic Use	27	17.1	23	12.0	0.17

Factors Affecting the Utilization of Antenatal Care

The unbooked patients are investigated about their reason for not attending the antenatal care and the Table no.6 given below shows that the majority of patients, i.e., about 68.7% of the unbooked patients, had a lack of transportation facility. Most of them were from villages so that they could not follow up regularly as scheduled in the antenatal care program. About 25.2% of the unbooked patients had sought antenatal care from other centres; about 8.9% of the patients were ignorant regarding the importance of antenatal care; 3.3% of them did not seek antenatal care due to poverty and one patient did not seek an antenatal care due to reluctance of getting multiple antenatal check-up.

Table 6. Factors affecting the utilization of Antenatal Care at Manipal Teaching Hospital		
Reasons for not attending ANC care	No. of patients	%
Ignorance/Illiteracy	19	8.9
Poverty	7	3.3
Transportation	147	68.7
Patient's choice	54	25.2
Reluctance to have multiple ANC visits	1	0.5

DISCUSSION

The aim of antenatal care is to help in early recognition of high risk conditions in the pregnant mother so as to act promptly to manage it. Adequate antenatal care tends to result in healthy mother and healthy baby as indicated by this research. This study has demonstrated a positive correlation between unbooked mothers with adverse maternal and fetal outcome. The maximum number of patients in unbooked group fell into the age group of 20-24 years, i.e., about 46.2% whereas the maximum number patients in booked group are of 20-29 years of age. This study also indicates that the antenatal care is not undertaken by younger age group. This finding of negative association between age and booking as recorded in this study is correlating with the observation of a study done by Dr. M. Vijayashree at Mamata General Hospital, Khammam in 2015and a study by Farzana Aamir et al at Jinnah Medical College Hospital, Karachi.[9,10] The teenage pregnancy and pregnancy at a young age is assumed to be linked to poor socioeconomic status and lack of education among the test subjects which may be the reason for poor knowledge about the importance of antenatal care during pregnancy. The attainment of quality antenatal care appears to depend on husband's occupation. Among the test subjects, 10.1% of husbands were unemployed and 34.2% of them were semiskilled who could not afford to provide quality antenatal care to pregnant mothers.

It is also observed that all three grandmultiparas in the study were unbooked cases. Also in agreement with findings in other studies (Rajlaxmi Mundhra et al, Owolabi A T et al), a significantly higher percentage of the grand multiparous patients were unbooked in the study, may be because their previous pregnancies did not encounter any obstetric complications or may be this was an unwanted child conceived due to contraceptive failure.[11,12]

It is observed that pregnancy outcome is poor in unbooked mothers as compared to booked mothers because of undiagnosed or late diagnosed cases of preeclampsia and eclampsia, gestational diabetes mellitus, placenta praevia, IUGR, and placental abruption. In this study, the two out of three cases of abruption placentae were preeclamptic and unbooked antenatal cases which signify the inadequate management of preeclampsia during antenatal visits that lead to serious consequence as abruptio placentae. Few cases got referred late from the health posts or other primary health care centres such as previous cesarean sections, preterm labor, and premature rupture of membrane. Hence, the rate of emergency caesarean section, maternal and perinatal morbidity and mortality were high in the unbooked mothers.

The percentage of cesarean section is slightly high in booked group 42.7%, whereas 38.6% in unbooked group and the similar finding was seen in the study by Dr. M. Vijayasree.[10] However, the percentage of Elective sections in booked group was higher (22.0%) than in unbooked cases (14.8%). This may be due to early recognition of cephalopelvic disproportion, malpresentation, previous cesarean section patients who were booked and their early diagnosis in the antenatal period minimized maternal and fetal morbidity and mortality. Emergency indications for cesarean sections, assisted breech deliveries and ventouse deliveries were more among unbooked cases. Indications for caesarean section like obstructed labour, threatened rupture were more in unbooked group. The preterm deliveries are high among unbooked patients in our study, i.e., about 12%, may be because of late presentation at an active stage of labor.

The patients referred with complications in late stages and those with preterm deliveries showed significantly poor perinatal outcome. In this study, there were 84.8% liveborn to unbooked mothers and 98% liveborn to booked mothers; 5.7% early neonatal death to unbooked mothers and 1.0% to booked mothers. Hence, the many complications could have been avoided with an early diagnosis at the antenatal visits.

This study emphasizes on the various factors such as poverty, illiteracy and ignorance, immediate unavailability of health services due to lack of transportation facility that directly hinder the pregnant mothers from seeking health care. Education for mothers, cheaper antenatal services, free health care facilities for the poor people, tertiary health care centres at every district and public awareness programmes can prevent the health hazards on mother and child due to pregnancy.

CONCLUSION

The booked mothers have shown better maternal and fetal outcome in comparison to unbooked mothers at Manipal Teaching Hospital. There is a positive correlation between seeking antenatal care and good maternal and child health at the end. This study also shows that socio-demographic conditions can have impact on determining the use of antenatal care during pregnancy. Quality antenatal care and its proper utilization can prevent the detrimental effects on mother and child health. The expansion of health care facilities; implementation of guidelines for quality antenatal care; provision of infrastructure such as transportation, regular training programmes, blood and blood products, operation theatres; mobilization of manpower and medical practitioners; and quick diagnosis of obstetrical emergencies can eliminate many dreadful maternal and fetal hazards.

REFERENCES

1. Ndiweni Q, Buchmann EJ. Unbooked Mothers and their babies:What causes the poor outcomes? S Afr Med J.1998 Feb; 88:192'195- 6'199.
2. UNICEF, WHO, UNFPA. Guidelines for Monitoring the Availability and Use of Obstetric Services. New York: UNICEF; 1997.
3. WHO, UNICEF, UNFPA, The World Bank. Trends in maternal mortality 1990-2010: estimates developed by WHO, UNICEF, UNFPA and the World Bank. Geneva: WHO; 2012.
4. WHO, UNICEF, UNFPA, the World Bank, the United Nations Population Division. Trends in estimates of maternal mortality ratio (MMR; maternal deaths per 100,000 live births) maternal deaths and lifetime risk of maternal death, 2000-2017. WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division (MMEIG) estimates; September 2019.
5. WHO, UNICEF, UNFPA, The World Bank, the United Nations Population Division. Trends in maternal mortality 1990 to 2013: WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division estimates. Geneva: WHO; 2014.
6. WHO. Levels and trends in child mortality report 2021. Geneva: WHO; 2021.
7. Ministry of Health (Nepal), New ERA, ORC Macro. Ministry of Health (Nepal), New ERA, and ORC Macro, 2002: Nepal Demographic and Health Survey. Nepal: Ministry of Health; 2001.
8. WHO. World health statistics 2011. Geneva: WHO; 2011.
9. Ekwempu CC. The influence of antenatal care on pregnancy outcome. Trop J Obstet Gynaecol 1988;1:67-71.Singapore Med J 2008;49(7):531.
10. Farzana Aamir, Atiya Fasih, Asha Mahesh, Emmanuel Qamar Charles. A comparative review of maternal morbidity and perinatal outcome in booked and un-booked mothers. Pak J Surg 2012;28 (4):280.
11. Vijayasree M. Comparitive Study of Maternal And Fetal Outcome Of Labour In Booked Versus Unbooked Antenatal Mothers In Rural India. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 2015 April;14(4):55-61.DOI: 10.9790/0853-14415561
12. Owolabi A T, Fatusi A O, Kuti O, Adeyemi A, Faturoti S O, Obiajuwa P O. Maternal complications and perinatal outcomes in booked and unbooked Nigerian mothers. Singapore Med J 2008;49(7):52. PMID: **18695859**
13. Mundhra R, Singh A S, Agarwal M, Kumar R. Utilization of antenatal care and its influence on fetal-maternal outcome: a tertiary care experience. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2013 Dec;2(4):600-6.DOI: 10.5455/2320-1770.ijrcog20131222