FREQUENCY OF MATERNAL AND PERINATAL COMPLICATIONS AMONG BOOKED AND UN-BOOKED ANTENATAL WOMEN

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ABSTRACT

OBJECTIVE: To find out the frequency of the maternal and perinatal morbidity and mortality among booked and un-booked antenatal women.

METHODS: This cross-sectional prospective study was conducted at Moulvi Ameer Shah Memorial Hospital, Peshawar, Pakistan from January 2013 to December 2013 on 2000 randomly selected antenatal women with single pregnancy. Patients were divided in two groups, booked and un-booked. Details of demographic features and antenatal complications were recorded on a pre-designed proforma. Significance of the difference between the booked and un-booked patients was calculated by Chi square test.

RESULTS: Out of 2000 antenatal women, 1160 (58%) were booked and 840 (42%) were un-booked. Instrumental delivery rate was 3.6% among un-booked mothers versus 2.3% in booked mothers ($p<0.001$). Emergency caesarean section rate was 8.89% in un-booked and 4.15% in booked patients ($p<0.001$). Anemia, Pregnancy-induced hypertension and premature rupture of membranes were observed in 223 (11.15%), 109 (5.45%), 102 (5.1%) un-booked and 90 (4.5%), 38 (1.9%) and 53 (2.65%) booked patients respectively. Birth asphyxia, low Apgar score, low birth weight and septicemia were observed in 170 (8.5%), 76 (3.8%), 208 (10.4%) and 62 (3.1%) neonates of un-booked mothers and in 104 (5.2%), 43 (2.15%), 61 (3.05%) & 40 (2%) neonates of booked mothers ($p<0.001$). The perinatal mortality rate was 3.6% (n=72) and 1.65% (n=33) in neonates of un-booked and booked mothers respectively ($p<0.001$). There was no maternal mortality.

CONCLUSION: The study showed a positive correlation between un-booked mothers and increased risks of maternal and fetal adverse outcomes. All the obstetric complications were more common among un-booked mothers.

KEY WORDS: Prenatal Care (MeSH), Antenatal care (Non-MeSH), Pregnancy (MeSH), Maternal Mortality (MeSH), Outcome (MeSH), Morbidity (MeSH), Obstetric Labor Complications (MeSH).

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INTRODUCTION

Antenatal care is the care of the women during pregnancy whose primary aim is to achieve a healthy mother and a healthy baby.[1] Antenatal care has been intensified over the last two decades due to the advent of the primary health care and global efforts over safe motherhood.[2]

An emergency can be defined as a situation of serious and often dangerous nature, developing suddenly, unexpectedly and demanding immediate attention in order to save life. Obstetric emergencies are the leading causes of maternal mortality worldwide and particularly in developing countries where literacy, poverty, lack of antenatal care, poor transport facilities and inadequate equipment/staffing combine to magnify the problem.[3] Maternal complications and poor perinatal outcome are highly associated with non utilization of antenatal and delivery care services and poor socioeconomic conditions of the patient, with poorer outcomes in un-booked than booked patients.[4] Maternal mortality rate is defined as the number of deaths from obstetric causes per 100,000 maternities. The perinatal mortality rate is the number of stillbirths and early neonatal deaths per 1000 live births and stillbirths.[5]

The millennium development goals 4, 5 were targeted to reduce the maternal and perinatal mortality by 2015. Perinatal morbidity and mortality are also important parameters for proper antenatal care.[6,7] Clinical audits relies on the continuing audit cycle aiming to improve standard of care constantly.[8]

This study is very important because maternal complications and perinatal outcomes are highly associated with non utilization of antenatal and delivery care services. This study was conducted to find out the frequency of the maternal and perinatal morbidity and mortality among booked and un-booked antenatal women.

METHODS

Two thousand antenatal patients were randomly selected admitted through out-patient department or via emergency included in the study. Inclusion criteria

were patients with a single pregnancy in labour, admitted for caesarean section or postnatal period. All patients were studied for the booking and non booking status. Exclusion criteria was multiple pregnancy, severe pre-eclapsia, eclampsia, severe antepartum and post-partum haemorrhage or any very high risk patient who can be managed better in a tertiary care hospital. Booked patients were those who had three or more visits to the hospital.

Details of booking and non-booking status, demographic features, obstetrical history, pre existing diseases, maternal and perinatal complications during pregnancy, labour, delivery and postnatal period were recorded on a pre designed proforma. The sample selection criteria was random selection of the patients but very high risk patients like eclampsia, severe haemorrhage and other serious emergencies that could be dealt in tertiary care hospital were not included in the study. Neonates were studied for birth asphyxia, septicemia, low one minute Apgar Score, neonatal jaundice and perinatal mortality. Significance of all the outcome measures among the booked and un-booked patients was calculated using and confidence interval determined.

RESULTS

Total 2000 antenatal women were recruited for the study. Among these patients 1160 (58%) were booked and 840 (42%) were un-booked. It was observed that booking was less among teen age mothers, 15 (0.75%) booked versus 149 (7.46%) un-booked ($p<0.001$). Overall 651 (32.55%) educated mothers were booked than 29 (1.45%) un-booked. The lower social class was 710 (35.5%) un-booked than 493 (24%) booked patients ($p<0.001$). Overall booking was more in the middle and upper class. Similarly multigravida and grand multigravida were more un-booked than primigarvida (Table I).

Anemia was observed in 223 (11.15%) un-booked patients versus 90 (4.5%) booked patients ($p<0.001$). Pregnancy induced hypertension was found in 109 (5.45%) un-booked as compared to 38 (1.9%) booked patients ($p<0.001$). Premature rupture of membranes (PROM) was found to be significantly decreased ($p<0.001$) in booked 53 (2.65%) as compared to un-booked 102 (5.1%). Post date pregnancy was found in 203 (10.15%) un-booked versus 121 (6.05%) booked patients (p<

TABLE I: SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF BOOKED AND UN-BOOKED WOMEN

Maternal variable	Booked patients [N=1160 (58%)]	Un-booked patients [N=840 (42%)]	CHI Sq^2	P value (95% CI)
Age (years)				
<19	15 (0.75%)	149 (7.45%)	1698	<0.001 (0.02, 1.01)
20-35	993 (0.65%)	480 (24%)	178	<0.001 (0.03, 1.01)
>35	152 (7.6%)	211 (10.55%)	346	<0.001 (0.03, 1.01)
Educational level				
Illiterate	509 (25.45%)	811 (40.55%)	766	<0.001 (0.04, 1.33)
Educated	651 (32.55%)	29 (3.45%)	1006	<0.001 (0.1, 1.23)
Primary education	632 (31.6%)	21 (1.05%)	1038	<0.001 (0.03,1.35)
Secondary education	11 (0.55%)	05 (0.25%)	1468	<0.001 (0.067, 0.88)
Higher	08 (0.4%)	03 (0.15%)	1474	<0.001 (0.75, 2.11)
Social class				
Upper	9 (1.95%)	18 (0.9%)	1842	<0.001 (0.75, 1.99)
Middle	628 (31.4%)	112 (5.6%)	1378	<0.001 (0.16, 1.88)
Lower	493 (24.65%)	710 (35.5%)	765	<0.001 (1.01, 1.23)
Parity				
Primigravida	529 (26.45%)	176 (8.8%)	867	<0.001 (0.67, 1.34)
Multigravida	611 (9.55%)	625 (31.25%)	314	<0.001 (0.88, 0.89)
Grand multigravida	20 (1%)	9 (1.95%)	1883	<0.001 (0.75, 1.89)
Profession				
House wife	1021 (51.0%)	817 (40.85%)	17	<0.001 (1.23, 1.99)
Job	19 (6.95%)	23 (1.15%)	2248	<0.001 (0.78, 1.98)

TABLE II: FREQUENCY OF OBSTETRIC COMPLICATIONS

Maternal variable	Booked patients [N=1160 (58%)]	Un-booked patients [N=840 (42%)]	CHI Sq²	P value (95% CI)
Anemia	90 (4.5%)	223 (11.15%)	149	<0.001 (0.67, 2.12)
PIH	38 (1.9%)	109 (5.45%)	1721	<0.001 (0.45, 1.78)
PROM	53 (2.65%)	102 (5.1%)	1272	<0.001 (0.78, 1.65)
Post Dates	121 (6.05%)	203 (10.15%)	1100	<0.001 (0.75, 1.56)
Preterm	51 (2.55%)	170 (8.5%)	1544	<0.001 (0.78, 1.04)
Labour induction	110 (5.5%)	213 (10.65%)	1418	<0.001 (0.56, 1.66)
Breech presentation	21 (1.05%)	70 (3.5%)	1823	<0.001 (0.68, 1.45)
Transvers lie	05 (0.25%)	12 (0.06%)	1966	<0.001 (0.45, 1.55)
Prolonged Labour	60 (3%)	110 (5.5%)	1677	<0.001 (0.66, 1.23)
Antepartum haemorrhage	9 (1.95%)	52 (2.6%)	1081	<0.001 (0.45, 1.44)
Post Partum haemorrhage	70 (3.5%)	220 (11%)	1481	<0.001 (0.67, 1.78)
Obstructed labour	76 (3.8%)	129 (6.34%)	169	<0.001 (0.78, 1.65)
Cord Prolapsed	03 (0.15%)	11 (0.55%)	1255	<0.001 (0.78, 1.45)
Ruptured Uterus	0 (0%)	4 (0.2%)	833	<0.001 (0.65, 1.78)
3rd Degree Tears	02 (0.1%)	9 (0.45%)	1978	<0.001 (0.88, 1.89)
4th Degree Tears	01 (0.08%)	2 (0.1%)	1444	<0.001 (0.67, 1.89)

PROM = Premature rupture of membranes; PIH = Pregnancy induced hypertension

TABLE III: MODE OF DELIVERY AMONG BOOKED AND UNBOOKED WOMEN

Maternal variable	Booked patients [N=1160 (58%)]	Un-booked patients [N=840 (42%)]	CHI Sq²	P value (95% CI)
Normal Vaginal Delivery	996 (49.8%)	561 (28.05%)	115	<0.001 (0.78, 1.89)
Instrumental delivery	46 (2.3%)	72 (3.6%)	1771	<0.001 (0.65, 1.03)
Vacuum delivery	33 (1.65%)	51 (2.55%)	1865	<0.001 (0.74, 1.56)
Forceps delivery	13 (0.65%)	21 (1.05%)	1932	<0.001 (0.67, 1.88)
Assisted breech delivery	9 (0.45%)	18 (0.9%)	805	<0.001 (0.76, 1.05)
Emergency caesarean section	83 (4.15%)	177 (8.89%)	1322	<0.001 (0.99, 3)
Elective caesarean section	26 (1.3%)	8 (0.4%)	677	<0.001 (0.66, 1.01)
Repair of ruptured uterus	0 (0%)	01 (0.05%)		<0.001
Total hysterectomy for ruptured uterus	0 (0%)	03 (0.15%)		<0.001

0.001). Obstructed labour was found in 129 (6.45%) unbooked as compared to 76 (3.8%) booked patients (p<0.001) and postpartum haemorrhage was observed in 220 (11%) un-booked versus 70 (3.5%) booked patients (p<0.001) (Table II).

Table III shows the mode of delivery of booked and un-booked mothers. It was observed that instrumental delivery rate was 72 (3.6%) in un-booked mothers than in 46 (2.3%) booked mothers (p<0.001). The need for emergency caesarean section were also more 177 (8.89%) in un-booked mothers than in 83 (4.15 %) booked mothers (p<0.001).

The birth asphyxia in neonates of was observed 170 (8.5%) in un-booked versus 104 (5.2%) booked patients (p<0.001). Neonates of the un-booked mothers suffered from septicaemia 62 (3.1%) as compared to 40 (2.50%) neonates of the booked mothers (p<0.001). Perinatal mortality rate 72 (3.6%), 85.7/1000 births in neonates of un-booked mothers than neonates of booked mothers 33 (1.65%), 28.45/1000 births (p<0.001) (Table IV). There was no maternal mortality among the both groups of patients.

Indications for the instrumental and caesarean deliveries are given in Table V. Prolonged 2nd stage of labour was the most common indication for instrumental delivery, observed in 42 (2.1%) un-booked patients and 9 (1.5%) booked patients (p<0.001). Fetal distress was the most common indication for emergency caesarean section in 41 (2.05%) un-booked patients and 26 (1.3%) booked patients (p<0.001).

TABLE IV: PERINATAL OUTCOME OF BOOKED AND UN-BOOKED MOTHERS

Variables	No. of Neonates of booked mothers (%)	No. of Neonatal of un-booked mothers (%)	CHI Sq²	P value (95% CI)
Birth Asphyxia	104 (5.2%)	170 (8.5%)	1495	<0.001 (0.71, 1.45)
Lowing A/S <7	43 (2.15%)	76 (3.8%)	1769	<0.001 (0.99, 1.03)
Low Birth Weight (<2.5kg)	61 (3.05%)	208 (10.4%)	1561	<0.001 (0.88, 1.90)
Septicemia	40 (2%)	62 (3.1%)	1800	<0.001 (0.45, 0.78)
Neonatal Jaundice	42 (2.1%)	103 (5.15%)	1723	<0.001 (0.75, 1.23)
Perinatal Mortality	33 (1.65%)	72 (3.6%)	1796	<0.001 (0.67, 1.66)
Fresh Still Born	2 (0.1%)	6 (0.3%)	2240	<0.001 (0.56, 1.77)
Intrauterine Deaths	23 (1.15%)	54 (2.7%)	1849	<0.001 (0.77, 1.45)
Neonatal Deaths	08 (0.4%)	12 (0.6%)	2143	<0.001 (0.78, 1.66)

A/S = Apgar score

TABLE V: INDICATIONS FOR THE INSTRUMENTAL AND CAESAREAN DELIVERIES

Variable	Booked (%)	Un-booked (%)	Chi sq² (95% CI)	P value
A. Instrumental delivery.				
Prolonged 2nd stage	9 (1.5%)	42 (2.1%)	1881 (0.71, 1.88)	<0.001
Fetal distress	11 (0.55%)	18 (0.9%)	1883 (0.76, 1.83)	<0.001
Poor maternal effort	05 (0.25%)	12 (0.6%)	1980 (0.58, 1.72)	<0.001
B. Caesarean Section				
Fetal distress	26 (1.3%)	41 (2.05%)	1889 (0.88, 1.96)	<0.001
Obstructed	15 (0.75%)	29 (1.45%)	1888 (0.78, 1.98)	<0.001
Breech	11 (0.55%)	23 (1.15%)	1883 (0.76, 1.83)	<0.001
Failure to progress	03 (0.15%)	13 (0.65%)	1258 (0.71, 1.82)	<0.001
Previous 1 C/S + CPD.	05 (0.25%)	09 (0.45%)	1257 (0.81, 1.47)	<0.001
Previous 1 C/S + Breech	03 (0.15%)	12 (0.6%)	1245 (0.58, 1.78)	<0.001
Previous 1 C/S + postdate	9 (0.45%)	09 (0.45%)	1258 (0.78, 1.76)	<0.001
Previous 2 C/S.	03 (0.1%)	07 (0.35%)	2249 (0.58, 1.78)	<0.001
Previous 3 C/S.	05 (0.25%)	02 (0.1%)		
Transverse lie	01 (0.05%)	06 (0.3%)	1966 (0.67, 1.87)	<0.001
Placenta previa	02 (0.1%)	01 (0.1%)	2242 (0.57, 0.87)	<0.001
Abruption	3 (0.15%)	81 (8.1%)		
Cord prolapsed	03 (0.15%)	1 (0.55%)	1255 (0.78, 1.66)	<0.001
Failed induction	02 (0.1%)	05 (0.25%)	2240 (0.56, 1.77)	<0.001
Ruptured uterus	0 (0%)	04 (0.2%)		
C. Elective Caesarean Section				
Previous 1 C/S CPD	3(0.15)	1(0.05%)	2240 (0.56, 1.72)	<0.001
Previous 2 C/S	7(0.35%)	2(0.1%)	1250 (0.56, 1.72)	<0.001
Previous 3 C/S	3(0.15%)	0	1978 (0.87, 1.83)	<0.001
Breech	6(0.9%)	02(.1%)	1878 (0.84, 1.88)	<0.001
Transverse lie	13(0.5%)	02(0.1%)	1878 (0.84, 1.83)	<0.001
PIH	3(0.15%)	1(.05%)	1448 (0.67, 1.99)	<0.001
Placenta previa	3(0.15%)			

CPD = Cephalopelvic Disproportion, C/S = Caesarean Section, PIH = Pregnancy induced hypertension

DISCUSSION

The study was conducted in a new hospital with the objective of setting protocols for the best patients care on one hand and using the resources of the hospital on the other hand minimizing patient's referral to the tertiary care hospital.

All the antenatal women were booked but follow-up visits were missed by many patients. The antenatal care is the care you receive from healthcare professionals during the pregnancy. Nice guidelines of clinical excellence recommend proper antenatal care to identify risk factors during pregnancy. The study of the efficiency of pregnancy care has been revolutionized by the establishment of the Cochrane collaboration. This has encouraged the evaluation of each aspect of antenatal care and allowed each to be meticulously examined on the basis of the available trials. The National Institute for Clinical Excellence (NICE) has begun to look at maternity care. The National Screening committee is responsible for developing standards and strategies.[5] The Royal College of Obstetricians and Gynecologists (RCOG) has many roles. These include developing guidelines, setting standards for the provision of care, training and revalidation, audit and research.[5] Worldwide, childbearing poses the major risk to the life of a woman. Whilst in developed countries it is assumed that childbirth is a safe process, for the majority of women in the world this is not the case. A WHO study has demonstrated that in the developing world, the ability of care to identify current risk is much more effective than trying to identify potential risk. Where no maternal risk is identified, it would appear that four antenatal visits are the most that is required during pregnancy. More care is needed for delivery and in the postpartum period than is currently provided in many areas.

The majority of patients 58% were booked while 42% were un-booked. This was close to study in Jinnah Medical College, Karachi where 60% were booked and 40% were un-booked showing trend of antenatal care as the hospitals are situated in the cities where population is more aware of the prenatal care.[8,9] In our study teenage mothers were more in un-booked 17.73% than in booked 1.29% showing lack of care among teenage mothers. Teenage un-booked mothers were also more 5.8% versus booked 3.9% in a study conducted by Jaleel et al in Lyari General Hospital[10] and Tufail et al in Baqai Medical University, Karachi.[11]

In our study where 25.45% illiterate mothers were un-booked than booked 40.50% and this fact was also observed in other studies.[12,13] The upper and middle social class had more visits to the antenatal clinic than lower social class. This trend had not changed as in all other studies.[8-10]

The instrumental delivery rate was also more in un-booked 2.3% than booked 3.6% in a study conducted by Danish in Ayub Medical College.[14]

The emergency caesarean section rate was 177 (8.85%) in un-booked mothers than in booked mothers 83 (4.15%). This was in comparison to a study by Danish where emergency caesarean section rate was 76.5% in un-booked mothers and 23.5% in booked mothers.[14]

The antenatal problem anaemia was 11.15% in un-booked mothers versus 4.5% in booked mothers. In a study by Gonied anaemia was 38.7% versus 18.8%[15] and in a study by Tufail et al anaemia was more in un-booked mothers.[11]

Pregnancy induced hypertension, pre mature rupture of membrane, post dates pregnancy, labour induction, antepartum and post partum haemorrage, obstructed labour and other complications were more in un-booked mothers. These obstetric morbidities were also reported high in a study by Jaleel et al[10] and tertiary health institution in south western Nigeria.[16] In our study the main perinatal outcome measures birth asphyxia, low one minute A/S, septicaemia, neonatal jaundice, low birth weight were more in neonates of mothers with poor antenatal care. These facts were also observed in other studies.[10,11,17]

The perinatal mortality rate was 3.6% (85.7/1000) births among neonates of un-booked mothers than booked mothers 1.65% (28.45/1000) births as observed in other studies.[10,11,17]

LIMITATIONS OF THE STUDY

The limitations of the study was limited staff, lack of multidisciplinary support, lack of backup of maternal and neonatal intensive care facility and limited blood bank. Due to these limitations patients with severe pre-eclampsia, eclampsia, severe ante-partum and post-partum haemorrhage, or any very high risk patient was referred to the tertiary care hospital.

CONCLUSION

The provision of proper antenatal care is important for the prevention of maternal and perinatal complications. The study showed a positive correlation between un-booked mothers and increased risks of maternal and fetal adverse outcomes.

RECOMMENDATIONS

It was observed in our study that the maternal and perinatal complications are increased due to poor prenatal care. Proper antenatal care is one of the steps to achieve millennium development goals 4 and 5. Antenatal and labor ward protocols can be designed for the proper patients care on the basis of above facts utilizing the hospital resources in the best interest of the patient particularly in the district hospitals minimizing patient's referral to the tertiary care hospitals.

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CONFLICT OF INTEREST

Authors declare no conflict of interest

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AUTHOR'S CONTRIBUTION

The sole author **DK** has made substantial contributions to the manuscript in terms of concept & study design, acquisition and analysis of data, drafting the manuscript & final approval of the version to be published.

Author agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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