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To study maternal complications in booked and unbooked cases

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Abstract
Background: The high maternal morbidity and mortality rates are indicators of the poor state of health services and it is pertinent to determine the relationship between the booking status of mother and its outcomes.
Methods: A prospective observational study was conducted over 200 booked and 200 unbooked pregnant women from December 2017 to June 2019 in obstetrics and gynaecology department of Muzaffarnagar Medical College, Muzaffarnagar. Patients admitted during the study period fulfilling the specified inclusion criteria after taking consent were assessed for eligibility. Women without any investigation or documentation were included and cases with gestational age less than 28 completed weeks were excluded.
Results: The difference in the mean age among booked and unbooked cases was not significant. Primigravida was significantly more in booked cases (58%) whereas multigravida in unbooked cases (54.5%). Maternal complications, IUD, neonatal deaths were more among unbooked cases as compared to booked cases.
Conclusions: Findings of the study shows that the maternal outcome in booked mothers is far better than in unbooked mothers and complications like hypertensive disorders of pregnancy, gestational diabetes anaemia are more common in unbooked mothers which will further affect their fetal outcomes. This study highlights the need of antenatal care to improve fetomaternal outcome.

Keywords: Booked cases, unbooked cases, antenatal care

Introduction
Pregnancy is one of the most important event in the life of a woman, her family and also for the society, extraordinary care is therefore provided by the health care system of our country [1].
India is a country with second largest population in the world. It is also one of those countries having high maternal and infant mortality rates. Maternal death is one of the most terrible ways to die, be it bleeding to death, convulsions of toxemia of pregnancy or agony of puerperal sepsis. Maternal complications and poor perinatal outcome are highly associated with non-utilization of antenatal and delivery care services and poor socioeconomic conditions of the patients with poorer outcomes in unbooked than booked patients.
Maternal health refers to the health of the mother during pregnancy, childbirth and the postpartum period [2]. Following the diagnosis of pregnancy, the first prenatal visit (booking visit) should occur during the first trimester. Consequently, a pregnant women is said to have "booked" if, excluding the booking visit, she attended at least three antenatal clinic visits and received at least one dose of tetanus immunization. She is also consider " booked" if, beside the booking visit, she makes a minimum of two more visits lasting not more than two weeks before delivery [3].
Maternal mortality has become a public health problem requiring urgent, concerted and effective intervention at the various levels of the society [4, 5]. Maternal complications and poor perinatal outcomes are highly associated with non-utilization of antenatal and delivery care services and poor socioeconomic conditions of the patient, with poorer outcomes in unbooked than booked patients [6, 9].
The purpose of this study was aimed to determine the maternal complications in booked and unbooked cases.

Material and method
A prospective observational study was done in Obstetric and Gyanecolgy ward of Muzafarnagar medical college & research centre.

The study was conducted over 200 booked and 200 unbooked patients over a period of one and half year i.e. from December 2017 to june 2019. Patients admitted during the study period fulfilling the specified inclusion criteria after taking consent were assesed for eligibility. Relevant clinical data regarding maternal age, gravida, any significant maternal disorders, blood pressure monitoring, investigations advised (hemoglobin estimation, random or fasting blood sugar estimation, urine for proteins) in appropriate patients, weight and sex of the baby, whether live birth or still birth etc. were noted.
Women without any investigation or documentation who delivered in department of obstetrics and gynaecology, Muzaffarnagar Medical College were included and Unbooked antenatal cases with gestational age less than 28 completed weeks were excluded.

Results

Table 1.

	Groups	Mean	Std. Deviation	t-test value	p-value
Age	Unbooked	27.61	4.53	1.712	0.188
	Booked	26.95	3.12		

No significant difference in mean age was found between unbooked and booked cases. Parity was significantly more among unbooked cases.

Table 2.

Age groups	Booked		Unbooked	
19-24 years	54	27.0%	63	31.5%
25-34 years	136	73.0%	114	57.0%
≥ 35 years	10	5.0%	23	11.5%
Total	200	100.0%	200	100.0%

No significant difference was found in the distribution of age groups between the booked and unbooked patients.

Table 3.

Parity	Booked		Unbooked	
Primigravida	116	58.0%	91	45.5%
Multigravida	84	42.0%	109	54.5%
Total	200	100.0%	200	100.0%
Chi-square value = 7.827, p-value = 0.035*				

Primigravida was significantly more among booked cases (58.0%) whereas the multigravida was significantly more among unbooked cases (54.5%).

Table 4: Comparison of distribution of Pregnancy outcome between booked and unbooked cases

Pregnancy outcome	Unbooked		Booked	
Term pregnancy (>37 weeks)	106	53.0%	182	91.0%
Preterm pregnancy (<37 weeks)	94	47.0%	18	9.0%
Total	200	100.0%	200	100.0%
Chi-square value = 11.098, p-value < 0.001*				

Chi-square test
* Significant difference

The comparison of Pregnancy outcome was compared between booked and unbooked cases using the Chi-square test. Preterm pregnancy (<37 weeks) was significantly more among unbooked cases.

Table 5: Comparison of distribution of maternal complications between booked and unbooked cases

	Unbooked		Booked		Chi-square value	p-value
Gestational hypertension	54	27.0%	18	9.0%	5.099	0.011*
Pre-eclampsia + eclampsia	48	24.0%	8	4.0%	3.023	0.028*
Anemia (< 7)	64	32.0%	14	7.0%	9.248	< 0.001*
Gestational diabetes	18	9.0%	8	4.0%	10.234	0.001*

Chi-square test
* Significant difference

The comparison of maternal complications was compared between booked and unbooked cases using the Chi-square test. Gestational hypertension, Pre-eclampsia, Anemia and Gestational diabetes was significantly more among unbooked cases.

Table 6: Comparison of distribution of Mode of delivery between booked and unbooked cases

Mode of delivery	Unbooked		Booked	
Vaginal Delivery	120	60.0%	161	80.5%
Forceps delivery	24	12.0%	11	5.5%
Elective caeserean section	26	13.0%	18	9.0%
Emergency caeserean section	30	15.0%	10	5.0%
Total	200	100.0%	200	100.0%
Chi-square value = 7.827, p-value = 0.008*				

Chi-square test
* Significant difference

The comparison of mode of delivery was compared between booked and unbooked cases using the Chi-square test. Caeserean section and forceps delivery were significantly more among unbooked cases.

Table 7: Comparison of distribution of Intra-uterine death between booked and unbooked cases

Intra-uterine death	Unbooked		Booked	
Yes	22	11.0%	6	3.0%
No	178	89.0%	194	97.0%
Total	200	100.0%	200	100.0%
Chi-square value = 8.206, p-value < 0.001*				

Chi-square test
* Significant difference

The comparison of Intra-uterine death was compared between booked and unbooked cases using the Chi-square test. Intra-uterine death cases were significantly more among unbooked cases.

Table 8: Comparison of distribution of Neonatal death between booked and unbooked cases

Neonatal death	Unbooked		Booked	
Yes	10	5.0%	2	1.0%
No	190	95.0%	198	99.0%
Total	200	100.0%	200	100.0%
Chi-square value = 4.370, p-value = 0.025*				

Chi-square test
* Significant difference

The comparison of Neonatal death was compared between booked and unbooked cases using the Chi-square test. Neonatal death was significantly more among unbooked cases.

Discussion

More than 500,000 women die of childbirth every year worldwide at present. One woman dies and twenty other suffer from injury or disease because of childbirth every minute. Of these, India alone accounts for about 100,000 maternal deaths every year. The maternal health programme, a component of the Reproductive and Child Health Programme, aims at reducing maternal mortality by the provision of essential and emergency obstetric care, facilitating referral transport, safe abortion and the detection and treatment of reproductive tract infections [10].

Most maternal deaths are due to hemorrhage, anemia and puerperal complications, obstructed labour, PIH, anemia and infections and the vast majority would be preventable with universal access to antenatal care and an effective system [10].

Adequate antenatal and delivery care enables obstetricians to diagnose complications at an early stage and hence intervention brings about better results. There is no doubt that the uses of maternal health services improve reproductive outcomes [11].

Age wise distribution of study population

No significant difference in mean age was found between unbooked and booked cases. The study by Hamilton *et al*. [12] Coronation Hospital and Johannesburg did not show the same pattern of negative association between age and booking status. This was comparable with the observation of study [13, 14] carried out in Saudi Arabia which suggested that women's age was not a significant predictor of utilization of ANC.

There was finding of negative association between age and booking in the observation of Tucker *et al*. [15] done at North Middlesex, London and Owolabi *et al*. [16] in Nigeria and Fawcus *et al*. [17], Harare Hospital Zimbabwe. This was in concordance with the study by Aamir *et al*. [18] as compared to booked mothers, unbooked mothers were younger in the age (15-25yrs, 27.8%, p=0.001).

Distribution of parity among study population

Parity was significantly more among unbooked cases compared to booked cases. This was similar to the study by Aggarwal *et al*. [10] primigravida booked cases (62.8%) were more than the unbooked cases (36.8%) and Aamir F *et al*. [18], primigravida women were more in booked cases.

Grandmultiparity is a notable risk factor in obstetrics as it is associated with complications [23] such as uterine rupture, placenta previa and secondary postpartum haemorrhage.

In the study by Sodje and Ande [22], Bad Obstetric History (BOH) was 3 times more common in the unbooked pregnant women (P<0.001). The unbooked patients seem not to realize that obstetric events that may have caused the previous perinatal losses could recur and that they may therefore need specialized care.

Distribution of delivery among study population

In our study, caeserean section was significantly more among unbooked cases. In the study by Aggarwal *et al*. [10] C-section was significantly more common in unbooked cases (40.8%) as compared to booked cases (33.8%), Aamir *et al*. [18] unbooked mothers had a greater rate of caesarean section as compared to booked mothers (31.5% and 19.6% respectively, p=0.001) and Egyptian study by Gonied *et al*. [20] reported c-section in 31.3% in unbooked cases and 12.9% in booked cases.

In the study by Chigbu *et al*. [21] unbooked mothers were about half as likely to deliver by spontaneous vaginal delivery compared to booked mothers (OR 0.64; 95% CI 0.55-0.73; P<0.001) and eight times more likely to be delivered by emergency laparotomy due to uterine rupture than booked mothers.

The reason behind this could be: many of the booked patients with complications like pregnancy induced hypertension, post caesarean status, primigravida with breech presentation attends labour room earlier and at the slightest and earlier detection of deviation from normal labour pattern undergo caesarean section.

Distribution of pre-term pregnancy study population

Preterm pregnancy (<37 weeks) was significantly more among unbooked cases. Gonied showed that unbooked mothers were twice as likely as booked mothers to deliver preterm babies.

Distribution of complications among study population

In our study, gestational hypertension, Pre-eclampsia, Anemia and Gestational diabetes was significantly more among unbooked cases.

This was similar to the study by Aggarwal *et al*. [19] the rate of eclampsia was higher in unbooked cases (5.2%) as compared to booked cases (0.6%) and this was a significant finding between both study groups and Vijaysree M *et al*. [10] in their observational study, eclampsia was seen in 0.8% of booked group whereas 5.34% of unbooked group.

This was similar to the study by Aamir *et al*. [18] unbooked mothers were prone to greater degree of antepartum hemorrhage (19.5%, as compared to 4% in booked mothers), Intra uterine growth retardation in unbooked mothers (10%, as compared to 3% in booked mothers). Also unbooked mothers were more likely to have obstructed labor than booked mothers (20% and 7.3% respectively) and premature rupture of membrane (18.5% and 8% respectively).

It is observed that pregnancy outcome is poor in unbooked mothers as compared to booked mothers because of late arrival and referral from primary care units, midwives and TBAs, undiagnosed cases of placenta previa, IUGR, placenta abruption, gestational diabetes, anemia, PIH, preclampsisa and eclampsia. Thus, because of these complications in the unbooked mothers, there is increased rate of caesarean section, maternal and perinatal morbidity and mortality.

The above is also reported by other studies. Several studies in our environment had elucidated various factors such as aversion for caesarean section, high hospital bills, religious belief, illiteracy, poverty and environmental and cultural prejudices as barriers hindering women from utilizing prenatal care and hospital delivery.

Distribution of Intra-uterine death among study population

Intra-uterine death was significantly more among unbooked cases. This was in accordance with the study by Chigbu *et al*. [21] unbooked mothers had were 13 times more likely to die in the hospital than booked patients.

Low birth weight and preterm newborns had greater than 5 and 3 times respectively more prevalence among the unbooked mothers than the booked in the study by Sodje and Ande [65]. Nutritional at ANC, routine use of anti-malarials and haematinics, early treatment of urinary tract infection, and other febrile illness in booked patients helps to reduce the incidence of preterm labour, preterm delivery and low birth 32 weight babies.

Maternal mortality was high in the study by Sodje and Ande [22], more so in the unbooked who had a significantly higher rate

(5068/100,000) than in the booked (544/100,000). The major causes of maternal deaths included PIH/eclampsia, HIV/AIDS related deaths, obstetric haemorrhage and obstructed labour. The MMR and major causes of maternal death were similar to those found at Sagamu [23]. The contribution by unbooked women to maternal mortality in that study was also similar to that of this study (88% and 89.3% respectively. This high maternal mortality rate in the unbooked is mainly due to late presentation and referrals with severe morbidities and complications that are difficult to reverse [24].

Distribution of Neonatal death among study population

Neonatal death was significantly more among unbooked cases. Jaleel R, Khan A [25]. Has shown that perinatal mortality rate was significantly higher among unbooked mothers than the booked ones.

In the study by Sodje and Ande [22], the unbooked women had a significantly greater tendency towards having stillbirths. Perinatal Mortality for the unbooked was 9 times higher than in the booked. The high perinatal mortality among the unbooked is probably due to the pregnancy complications and morbidity with which the unbooked women presented including preterm labour, severe intra-uterine growth restriction, HIV/AIDS without prior use of Highly Active Anti-Retroviral Therapy, severe pregnancy induced hypertension /preeclampsia/eclampsia and obstructed labour. Researchers have found in their studies that infants of the unbooked are significantly more likely to be preterm.

Conclusion

The present observational study was done to assess the maternal complications, perinatal outcome. Primigravida was significantly more among booked cases (58.0%) whereas the multigravida was significantly more among unbooked cases (54.5%).

Instrumental deliveries and emergency caeserean sections were significantly more among unbooked cases.

Preterm pregnancy (<37 weeks) was significantly more among unbooked cases (47.0%) compared to booked cases (9.0%).

Gestational hypertension, Pre-eclampsia, Anemia and Gestational diabetes was significantly more among unbooked cases.

Fetal complications such as NICU admission, Intra-uterine deaths and neonatal deaths were significantly more among unbooked cases.

This study shows the various complications in unbooked and booked pregnancies and their impact on the fetomaternal outcome. It also focuses on the importance of antenatal care to ensure successful fetomaternal outcome. Our aim is to motivate the health care provider to encourage the pregnant mother for regular antenatal care. Measures to reduce maternal and perinatal morbidity and mortality must address the root causes of a significant number of women in developing countries not being booked in hospital for ANC and delivery.

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