

Does an Antenatal Care make a difference?

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ABSTRACT

Antenatal Care utilization and its effects among booked and unbooked women were studied retrospectively in Obstetrics-Gynaecology Department, Punjab Institute of Medical Sciences, Jalandhar (India) during April- June, 2012. Demographic variables, obstetric history and event outcomes were explored. Unbooked (58%) status was seen with primiparity, low socioeconomic status ($p < 0.01$) and younger age ($p < 0.001$; 20-25 yrs). 37.21% of unbooked mothers had Anemia ($p < 0.01$) while fetuses of 24.14% mothers developed Fetal Distress. Incidence of Oligohydramnios, Pregnancy Induced Hypertension, Intrauterine Growth Retardation, Preterm Premature Rupture Of Membrane and Preterm Labour were higher among unbooked mothers. Unbooked status had higher Preterm (22.42%) and Low Birth Weight babies (51.73%). Majority of mothers of moderate age (40.48%; 26-30yrs), high socioeconomic status (26.20%) and multiparity (54.77%) booked themselves. The lack of required antenatal care might have led to higher obstetric complications among unbooked mothers. Improving socioeconomic status and women literacy rate may increase the number of booked mothers which may provide them the needed antenatal care.

Key Words: Antenatal care, Booked, Obstetric complications, Unbooked.

INTRODUCTION

The target of the fifth Millennium Development Goal (MDG) was a 75% reduction in maternal mortality between 1990 and 2015 which is proving hard to reach in many countries despite launch over 21 years ago of Safe Motherhood Initiative (United Nations, 2006; Qureshi, 2008; Chigbu *et al.*, 2009). Half of maternal deaths worldwide in 2008 were recorded in only six countries, three of which are in South Asia namely India, Pakistan and Afghanistan (Hogan *et al.*, 2010). According to latest United Nations report, India is likely to miss the MDG related to maternal health with one maternal death reported every ten minutes. While there is improvement from maternal death in every six minutes in 2010 to every ten minutes with maternal mortality rate of 212/lakh live births at present, however, country's target is 109/lakh live births by 2015.

Though India has reduced maternal mortality rate significantly from 437/lakh live births in 1999 to 212 but needs to hasten pace under National Rural Health Mission to achieve the related MDG ([http:// www.thehindu.com /health/policy-and-issues/article 3595095.ece](http://www.thehindu.com/health/policy-and-issues/article_3595095.ece); retrieved on August 15, 2012).

Antenatal Care is an important determinant of high maternal mortality rate and one of the basic components of maternal care on which life of mothers and babies depends (Nisar and White, 2003). The World Health Organization (WHO, 1991) defines antenatal care as a dichotomous variable, having had one or more visits to a trained person during pregnancy. It includes routine follow up provided to all pregnant women at primary care level from screening to intensive life support during pregnancy and up to delivery (Nisar and White, 2003). Several studies conducted in developing countries on demographic and socio-cultural factors influencing the use of maternal health care services, have shown that factors like maternal age, number of living children, education, place of residence, occupation, religion and ethnicity are significantly associated with the use of antenatal care (Bhatia, 1993; Babalola and Fatusi, 2009). The other factors like poor state of health services, widespread ignorance, pervading superstition, traditional beliefs and customs and high hospital bills tend to make traditional medicine and faith based practices arguably more popular than orthodox obstetric practice in our communities. Evidence based medicine indicates that most pregnancy related maternal deaths could be averted with access to professional care during pregnancy and delivery care and puerperium, as well as access to emergency obstetric care in the event of complication (United Nations, 2007). Conversely, various studies have associated lack of proper antenatal care with adverse maternal outcomes (Ekwempu, 1988; Owolabi *et al.*, 2008). Further, a study done in Nigeria (Fawole *et al.*, 2102) has concluded that no antenatal care, parity, level of education, and mode of delivery were significantly associated with maternal mortality. While, Low maternal education, high parity, emergency caesarean delivery, and high risk patients risk independently predict maternal mortality.

Early antenatal care has many benefits and these includes accurate dating, early detection of medical disorders that could threaten pregnancy and its outcome, objective assessment of

maternal baselines such as weight, blood pressure and urinalysis that may provide a picture of pre pregnancy condition of women (Abou-Zahr and Wardlaw, 2003). Other services provided include provision of tetanus toxoid vaccine, iron/ folic acid supplementation and control of nutritional deficiencies (Child Health Research Project,1999; Darmstadt *et al.*, 2005). Women will also receive assistance in developing a birth plan and be prepared for parenting after childbirth (WHO, 2005). It raises awareness and makes pregnant women and their families familiar with health facilities which enable them to seek help more efficiently during crisis (Katib *et al.*, 2009). Evidence from community based study in Tamil Nadu (India) suggested that antenatal care also influences postpartum health seeking behavior of women (Hedgaard and Thilsted, 1998; Fatim and Avan, 2002).

The World is facing several consequences for not approaching to antenatal care. In developing countries, complications of pregnancy and childbirth are leading causes of death among women of reproductive age. More than one woman dies every minute from such causes; 585,000 women dies every year. Less than 1% of such deaths occur in developed countries, demonstrating that they could be avoided if resources, services and fairness of its distribution were made available (Pokharel *et al.*, 2007). Each year almost eight million stillbirths and early neonatal deaths occur. In addition to maternal deaths, more than 50 million women experience maternal health problems annually. One quarter of all adult women living in developing world currently suffer from short or long term illness and injuries related to pregnancy and childbirth (Harrison, 1998).

On the other hand, utilization of antenatal care is regularly monitored in most settings and has improved considerably in developing countries since 1990s but there is little evidence on content and quality of antenatal care in these settings (Sikosana, 1994). In fact, weak relationship between antenatal care utilization and maternal health outcomes has been observed in some studies which may be partly due to failure to take into account content and quality of antenatal care provided (Mcdonagh, 1996). A previous study conducted in India has reported poor quality of antenatal care as likely to be responsible for the reduction of the utilization of antenatal care and recommended policy & program interventions to improve quality of antenatal care and maternal health outcomes (Rani *et al.*, 2008).The current study was organized to determine the

factors affecting utilization of Antenatal Care and its effects on pregnancy outcome among booked and unbooked mothers.

MATERIALS AND METHODS

Mothers who had antenatal care and delivered at Punjab Institute of Medical Sciences (PIMS), Jalandhar (Punjab, India) were retrospectively studied during the period of April, 2012 to June, 2012 in the department of Obstetrics and Gynaecology. Their data was compared with that of women who never had antenatal care but delivered at our institution during the same period of time (unbooked mothers). Technically, booked mothers were defined as those who had at least three antenatal visits at our center while unbooked mothers included those who had no prenatal care during their whole pregnancy and also those who were referred in emergencies from other medical centers and hospitals. PIMS is a tertiary care centre which provides emergency obstetric care services to women referred from other centers in addition to providing antenatal care and delivery services for low and high risk booked pregnant women. Structured questionnaire was designed to identify antepartum, intrapartum and postpartum experiences of women. It consisted of demographic variables, obstetric history, maternal outcome and neonatal outcome. The study protocol was submitted to Institutional Ethical Committee which got ethical clearance later.

The data were collected by personally interviewing the patients during that period either on the day or day after delivery. Prior to interview, the study purpose and objectives were explained to participants and their verbal consent was obtained. The pregnant women were also reassured about confidentiality of information and no women refused to participate in the study. Dependent variable was categorized into women who utilized and who didn't utilize the antenatal care. Independent variables were demographic variables, obstetric complication developed during antepartum, intrapartum and postpartum period, maternal outcome and neonatal outcome. Demographic variables included age, socioeconomic status and booking status. Obstetric history included parity status, maternal health before & during pregnancy, significant clinical events in previous pregnancy and detailed information regarding complication occurring intrapartum or postpartum. Maternal outcome was recorded which included mode of delivery, occurrence of

anemia, postpartum hemorrhage and maternal death. Neonatal outcome such as gestational age, birth weight, perinatal mortality etc. was also documented. Investigations were also done in all the women that included complete blood count, urine analysis, random blood sugar, blood grouping, HIV, Hepatitis C and Hepatitis B antigens, bleeding & clotting time and baseline ultrasonography. Specific investigations were done relevant to medical disorders if present in any patient.

So, the subjects were divided into two groups on the basis of booking status. The various factors affecting the utilization of Antenatal Care and its effects on pregnancy outcome among booked and unbooked women were studied. The results were analyzed by Chi Square test. P value <0.05 was considered as significant.

RESULTS

All patients were divided into two groups on the basis of booking status. 42% of patients booked themselves for antenatal care while 58% of patients came in referred status from periphery or other facilities.

Table 1 describes the demographic variables among two groups. Majority of unbooked patients (51.73%) falls in 21-25 yrs of age group while booked patients (40.48%) to 26-30 yrs of age group. This shows that young age group of unbooked patients is responsible for non attendance at antenatal care clinics. The analysis of socioeconomic status showed that all the patients from low socioeconomic status who were delivered at PIMS falls in unbooked category (29.32%) while mothers belonging to high socioeconomic class had higher number in booked category (26.20%) as compared to unbooked category (08.63%).

The results further showed majority of primiparous mothers (62.07%) had non attendance at antenatal clinic while multiparous mothers (54.77%) approached for antenatal care. The rate of Caesarean Section is nearly approximate in both groups (66.67% in booked group and 63.08% in unbooked group). It reflects that the mothers who had complications in their previous or current pregnancy had gone for antenatal care and these complication had resulted in caesarean sections.

Table 2 presents the event outcomes of all the pregnancies. Unbooked status had led to higher number of Preterm (22.42%) and Low birth weight babies (51.73%) when compared to booked status (11.91% Preterm and 42.86% Low birth weight babies), although the differences were not statistically significant.

TABLE 1: Demographic variables compared between Booked and Unbooked groups.

CATEGORY	Booked Mothers (42%)		Unbooked Mothers (58%)		p value
	Percentage (%)	Number of subjects	Percentage (%)	Number of subjects	
AGE (Yrs.)					
<20	02.39	01	15.52	09	df=3; p<0.001
21-25	30.96	13	51.73	30	
26-30	40.48	17	25.87	15	
>30	26.20	11	06.90	04	
SOCIO ECONOMIC STATUS					
Low	00.00	00	29.32	17	df=2; p<0.01
Middle	73.81	31	62.07	36	
High	26.20	11	08.63	05	
PARITY					
Primiparity	45.24	19	62.07	36	NS
Multiparity	54.77	23	37.94	22	
MODE OF DELIVERY					
Vaginal Delivery	33.34	14	36.21	21	NS
Caesarean Section	66.67	28	63.80	37	

(NS- Non Significant, df- degree of freedom)

TABLE 2: Event outcomes compared between Booked and Unbooked groups.

CATEGORY	Booked Mothers (42%)		Unbooked Mothers (58%)		p value
	Percentage (%)	Number of subjects	Percentage (%)	Number of subjects	
Gestational Age					
Preterm	11.91	05	22.42	13	NS
Term	88.09	37	77.59	45	
Birth Weight					
<2.5 kg	42.86	18	51.73	30	NS
>2.5 kg	57.15	24	48.28	28	

(NS- Non Significant)

Table 3 explains the obstetric conditions among primiparous and multiparous groups. The rates of Anemia (37.21%; $p < 0.01$), Pregnancy Induced hypertension (17.25%), Intrauterine Growth Retardation (15.52%), Oligohydraminos (18.97%), Fetal Distress (24.14%), Preterm Premature Rupture Of Membrane (12.07%), Preterm Labour with Scar Tenderness (10.35%) and Multiple Gestation (05.18%) were higher among unbooked status. While mothers with Previous Caesarean Section (26.20%), Gestational Diabetes Mellitus with Macrosomia (04.76%), Placenta Previa (07.15%) and Malpresentation (09.53%) approached themselves for antenatal care.

Table 3: Obstetric Complications compared between Primiparous and Multiparous groups.

OBSTETRIC CONDITIONS	Booked Mothers (42%)		Unbooked Mothers (58%)		p value
	%	No. of subjects	%	No. of subjects	
Anemia	11.91	05	37.21	21	<0.01
PIH	04.76	02	17.25	10	NS
Placenta Previa	07.15	03	06.90	04	NS
IUGR	11.91	05	15.52	09	NS
Oligohydraminos	09.53	04	18.97	11	NS
Fetal distress	21.43	09	24.14	14	NS
Previous Caesarean Section	26.20	11	13.80	08	NS
PPROM	04.77	02	12.07	07	NS
Preterm labour with Scar Tenderness	09.53	04	10.35	06	NS
Multiple Gestation	02.39	01	05.18	03	NS
Malpresentation	09.53	04	08.63	05	NS
Failed Labour	04.76	02	03.45	02	NS
GDM & Macrosomia	04.76	02	00.00	00	NS

(PIH: Pregnancy Induced Hypertension, IUGR: Intrauterine Growth Retardation, PPRM: Preterm Premature Rupture Of Membrane, GDM: Gestational Diabetes Mellitus, NS: Non Significant).

DISCUSSION

The key objective of maternal health care for pregnant women is to present themselves early for antenatal care in order to allow enough time for essential diagnosis and treatment regimens (Oladokun *et al.*, 2010). WHO (1994) recommends that pregnant women in developing countries should seek antenatal care within first four month of pregnancy. In developed countries such as UK and USA, antenatal care is recommended within first three months of pregnancy (National Institute for Health and Clinical Excellence, 2003; Adekanle and Isawumi, 2008). In this study, demographic characteristics, obstetrical complications and pregnancy outcomes in unbooked mothers were compared with booked mothers during antepartum, intrapartum and postpartum phases of pregnancy. The results showed that the required antenatal care was seen missing among unbooked mothers which might have led to higher rate of obstetric complications among them. The existence of high risk of obstetric complications among unbooked mothers has been supported by various other studies (Okoqbenin *et al.*, 2007; Owolabi *et al.*, 2008; Gonied, 2011).

The analysis of demographic factors (**Table 1**) among booked and unbooked mothers showed that young age ($p < 0.001$; 21-25 yrs) of mothers along with lack of awareness regarding importance of antenatal care & lack of education especially health education might have withdrawn them from taking antenatal care at an early gestational age or till the development of obstetric complication which had led them to fall into unbooked group (51.73%). This issue is also documented by other studies (Fawcus *et al.*, 1992; Adekanle and Isawumi, 2008; Chigbu *et al.*, 2009) which concluded that women who are less than 25yrs old and less educated are more likely to register late. Our study found the relation between unbooked category and low socioeconomic scale ($p < 0.01$; 29.32%) which has been consistent with other studies (Fawcus *et al.*, 1992). It describes mothers with low socioeconomic scale either approach for antenatal care in late pregnancy or during delivery with complicated stage of labour. It has been also recognized that mothers with low socioeconomic scale used to deliver more frequently at home with no trained health attendant in the developing world (Wagle *et al.*, 2004). On the other side, mothers of high socioeconomic scale had higher number in booked group (26.20%) as compared to their counterpart group (08.63%). It reveals that financial issue which includes cost of

antenatal services and transportation might be cited as one of the factor affecting utilization of antenatal care (Ye *et al.*, 2010).

When further subgroup analysis was done regarding parity, association of unbooked group (62.07%) was seen with primiparity (Fawcus *et al.*, 1992). This shows primiparous mothers are high risk patients. Comprehensive antenatal care should be provided to this group of patients to have better maternal and neonatal outcomes (Danish *et al.*, 2010). In our study, rate of caesarean section is nearly approximate among both groups (66.67% in booked and 63.80% in unbooked). This shows that the mothers who approached for antenatal care had higher number of caesarean deliveries (66.67%) than vaginal deliveries (33.34%). These results have been quoted by other authors also (D'Orsi *et al.*, 2006; Unnikrishnan *et al.*, 2010). This may be because women who had complications had gone for antenatal care and these complication had resulted in caesarean sections. On the other hand, rate of caesarean deliveries (63.80%) among unbooked patients was also found on higher side than vaginal deliveries (36.21%). The same has been concluded by the study conducted at a teaching hospital in Osogbo (Adekanle *et al.*, 2008). Kim *et al.* (2012) has proposed that timely referral within and to Emergency Obstetric Newborn Care (EmONC) facilities would decrease the proportion of CS deliveries that develop to emergency status. It could have been because of negligence of understanding the seriousness of patient's condition, financial constraints, referral system and non availability of transport to shift patients towards tertiary care centers which makes condition among unbooked group further complicated resulting in caesarean section. However, some other study has reported contrast finding of higher rate of vaginal births among unbooked mothers (Hamilton *et al.*, 1987).

Regarding neonatal outcome (**Table 2**), unbooked status had led to higher number of preterm (22.42%) and/or low birth weight babies (51.73%). Fawcus *et al.* (1992) and Singh *et al.* (2009) also observed the same status in their studies. This shows that unbooked status contributes to maternal undernourishment and inadequate care during pregnancy which results in obstetric complications thus compromising both mother and baby. Various maternal complications such as GDM, antepartum hemorrhage (APH), anemia, PPRM, and smoking shesha during pregnancy are significantly increasing the risk of LBW outcome (Bener *et al.*, 2012). The study conducted

by Jirojwong and Skolnik (1990) concluded that even when major potential confounders such as maternal age or mother's level of education are controlled, the relationship between no antenatal care or antenatal care from traditional birth attendants with low birth weight is still maintained. However, the study conducted by Adelusi *et al.* (1990) has shown that a level of parity, gestational age and birth weight didn't appear to significantly influence the tendency of to be booked or unbooked. While, another study has concluded that birth weight increased with increased total number of antenatal care (Kadapatti and Vijayalaxmi, 2012).

Regarding obstetric complications (**Table 3**), prevalence of anemia were higher among unbooked mothers ($p < 0.01$; 37.21%). It has been also supported by Nagaraj (2003). This shows that unbooked status could have led to undernourishment and inadequate care during pregnancy which along with other factors like; depletion of iron stores in previous pregnancies, inadequate spacing between consecutive pregnancies and inadequate protein and caloric consumption due to unavailability of proper share of nutrition and negligence due to care for other children and households by the unbooked group had resulted in anemia. 17.25% of unbooked and 04.76% of booked women was complicated by Pregnancy Induced Hypertension (PIH). High occurrence of PIH in unbooked women has been consistent in other studies (Ohonsi and Ashimi, 2008; Chigbu *et al.*, 2009). Prevalence of Intrauterine Growth Retardation (IUGR) and Fetal Distress (FD) were also reported higher among unbooked group (15.52% and 24.14%, respectively). The study conducted by Khatoon *et al.* (2011) has shown that one of the most common reasons among unbooked women who were admitted as referred patient was fetal distress due to meconium stained liquor. Corio-Soto *et al.* (1996) has concluded in their study that reduction in the incidence of births with IUGR could be expected if women could attend an adequate number of antenatal visits. Higher incidence of Oligohydraminos among unbooked group as compared to their counterpart (18.97% vs. 09.53%) in the present study has been also reported by some other study (Bangal *et al.*, 2011). The current study noticed higher rate of Preterm Premature Rupture Of Membrane in unbooked group (12.07%) which has been found by other authors also (Pattinson and Rossouw, 1987). Preterm Labour (10.35%) had been observed at higher rate among unbooked category (Anrolu *et al.*, 2003; Mutihir and Nyiputen, 2007; Omole-Ohonsi and Attah, 2012).

When subgroup analysis was done in relation to booked mothers, patients with abnormal location of placenta (placenta previa) had booked (07.15%) themselves for antenatal care. However, study conducted by other researchers (Loto and Onile, 2008) had found incidence of placenta previa higher among unbooked mothers. Our study observed that mothers who had history of Caesarean section in previous pregnancy had booked early for antenatal care (26.20%). This could have been because of complications in previous pregnancy that led them to approach for antenatal care early in current pregnancy. Mothers with breech malpresentation had booked (09.53%) themselves which has also been reported by Adeyemi *et al.* (2011). However, another study done by Jadoon *et al.* (2008) had seen unbooked status among mothers with breech malpresentation. Our study had found booking status among mothers with Gestational Diabetes Mellitus and Macrosomia (04.76%). While study by Ozumba *et al.* (2004) has contrast finding of poor control of diabetes among mothers with late antenatal booking.

Various authors have studied the barriers to the utilization of antenatal care like; distance to health facilities, mothers less exposed to mass media, mothers reporting no obstetric complication during pregnancy, low household wealth index, disempowerment of women, education of women and her husband (Nisar and White, 2003; Pokharel *et al.*, 2007; Collin *et al.*, 2007; Titaley *et al.*, 2010). Presence of electricity in house was strongly associated with utilization of antenatal care. Women whose husbands were in white collar occupation were utilizing antenatal care more significantly than women whose husbands were in blue collar occupation (Fatim and Avan, 2002). Kowalewski *et al.* (2000) found, besides well known geographical and financial barriers, pregnant women have different perception and interpretation of danger signs. Rural women avoid hospital because they fear discrimination and had fear of urban environment. Another study by Aved *et al.* (1993) studied various barriers like; difficulty in getting appointment, didn't know where to go, child care and family problem, felt fine and no need to go, pregnant before and know all, no telephone, felt depressed, denial of pregnancy, attitudes of physicians and nurses, unaware of pregnancy, afraid of examinations, clinic hours inconvenience, couldn't see same physician, didn't like doctors, long wait hours during visit etc. To bring improvement in proportion of booked mothers need effective action not only by health sectors but also by major other development sectors such as education, economic development &

employment sector. To work on the same track, Janani Suraksha Yojna (JSY, 2006) which literally means 'Pregnant Women Safety Scheme' has been introduced in India. The Yojana has identified 'ASHA' (Accredited Social Health Activist) as an effective link between the Government and the poor pregnant women. Role of ASHA is to provide and help the women in receiving at least three antenatal checkups including Tetanus injections and Iron & Folic Acid tablets, identify a functional Government health centre or an accredited private health institution for referral and delivery, counsel for institutional delivery, escort the beneficiary women to the pre-determined health center and stay with her till the woman is discharged etc. Thus, an introduction of ASHA is the step in right direction to enhance booking status and institutional deliveries.

CONCLUSION

The required antenatal care was seen missing among unbooked mothers that might have led to higher rate of obstetric complications among them. Preconception clinics and Community awareness campaigns may play an important role in teaching these women regarding the importance of antenatal care. Improving socioeconomic status and literacy rate of women which would further increase per capita income may help to increase number of mothers among booked category. Awareness regarding nutritious dietary habits among would be mothers especially highlighting importance of iron supplementation and appropriate food intake during pregnancy is recommended.

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