Initiation of Antenatal Care, Content of Care Received and Determinants for Early Visit - An Opportunity Still Missed in Pakistan

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ABSTRACT

Background: Antenatal care coverage increased tremendously in the last two decades in developing countries, with at least half of women having 4 or more visits to a clinic. But this rise in utilization did not translate into substantially lower maternal and neonatal mortality rates.

Objective: To determine the time of initiating antenatal care and assess the effect of time of initiation of antenatal care (ANC) on the content of care received and factors associated with the time of initiating care.

Methods: This was a retrospective cross-sectional study conducted from September 2020 to December 2020. The study population included all women who delivered at the hospital. The time of the first antenatal visit and content of care received by the woman was assessed. The primary outcome variable was the time of the first antenatal visit. Secondary measures included the content of care received by women.

Results: Of the 1388 women included, only 160 (11.5%) had their first visit before 14 weeks of pregnancy. When stratified according to time of visit, blood pressure measurement (p=0.021), weight measurement (p= 0.011), urine testing (p=0.015) and iron and folic acid supplementation (p=0.013) were significantly greater for women who started care within three months. Women who were older (p<0.001) and had delivered before (p=0.001) were more likely to access antenatal care earlier. Similarly, women with some education (p <0.001) and higher monthly income (p=0.003) started visits sooner than those who were uneducated and had lesser income. On the multivariable model, lower age, being nulliparous, no formal education and lower income were determinants of late booking.

Conclusion: The prevalence of early initiation of antenatal care was very low. The content of care received by women who presented early was also significantly different from those who presented late. Older age, previous birth; education and monthly income were determinants of early antenatal care visits. Awareness programs for early initiation of antenatal care need to be implemented.

Keywords: *Antenatal care, time of initiation, content of antenatal care, obstetrics, maternal health care.*

INTRODUCTION

Antenatal care is a key component of modern obstetrics. It ensures better outcomes for women with high-risk pregnancies and allows all women to receive preventive maternal health care. In addition, it provides an excellent opportunity for the pregnant woman to dispel myths about pregnancy and build rapport with the team who is going to look after her [1].

Antenatal care coverage increased tremendously in the last two decades in developing countries, with as high as 52% of women having 4 or more visits to a clinic. But this rise in utilization did not translate into substantially lower maternal and neonatal mortality rates [2]. In Pakistan, the antenatal care coverage improved from 26% to 78% but a similar decrease in the mortality rate both maternal and neonatal was not witnessed [3]. Presentation to the antenatal care clinic is often the only time a woman comes in contact with a health professional. But this

increasing attendance at antenatal care in Pakistan can merely pass for better service provision and not actual service utilization. There is a need to motivate women to not just access this service but utilize it to its true potential. Antenatal care is the best platform for screening, educating and providing needed healthcare during pregnancy.

The disparity between the reported antenatal care coverage and mortality rate has led researchers to evaluate the initiation and content of care provided. World Health Organization (WHO) recommends a minimum of 4 visits for pregnant women. It also recommends that the first visit should take place before 14 weeks [4].

A recent survey stressed the need for the collection of data regarding the time of initiation of antenatal care rather than just documenting whether antenatal care was accessed. As the content of care received during antenatal care may be associated with the timing of initiation, assessing the timing of initiation should be considered a performance indicator of antenatal care. But this study was a survey and included women who had delivered during the past two years. The recall bias

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in this study could be a factor that was also pointed out by the authors [5].

A woman who initiates care after the first trimester is less likely to obtain the full range of services recommended by (WHO) than a woman who receives care earlier in pregnancy [6]. WHO recommended minimum standard content includes blood pressure and body weight measurement, urine detailed report, tetanus toxoid, supplementation of iron and folic acid and counselling about danger signs that may occur in pregnancy and need medical attention [4].

We undertook this study to determine the time of initiating antenatal care and assess the effect of the time of initiation of antenatal care on the content of care received and factors associated with the time of initiating care.

METHODS

The present study was conducted at Abbasi Shaheed Hospital by reviewing the records of women who delivered at the facility from September 2020 to December 2020.

Records of all women who delivered at the hospital were analyzed. Those who delivered at the hospital but presented only at the time of labor were excluded. Those who had lost all records at the time of data collection were also excluded. A woman was considered booked if she had 4 or more visits and to be booked early if the first visit occurred before 14 weeks or visiting (within 3 months) of pregnancy as per WHO recommendations [6].

A proforma was used to collect the data. The proforma was divided into three sections; the first section included sociodemographic data of the woman, her age, parity, educational status and economic status. The second section included the time of initiation of antenatal care and the number of visits to the facility. The third section included contents of care *i.e.* Blood pressure and body weight measurement, urine detailed report, tetanus toxoid, supplementation of iron and folic acid and counselling about danger signs. The primary outcome variable was the time of first antenatal visit *i.e.* before 14 weeks of pregnancy or those visiting within three months of pregnancy. Secondary measures included the content of care received by women and factors associated with the initiation of care in the pregnancy.

The variables for the study were as follows; maternal age, parity, educational status, Monthly income [Low (Monthly income ≤ 10,000 Pakistani rupees (PKR)) Middle (Monthly income 10,000PKR-40,000PKR) and Upper (Monthly income > 40,000PKR)], the time of initiation of antenatal care (within three months or 14 weeks/ after three months or 14 weeks of pregnancy) and the number of visits (less than 4 visits/ 4 or more visits). The content of care received variables were; Blood pressure measurement, body weight measurement, urine detailed

report, tetanus toxoid, supplementation of iron and folic acid and counselling about danger signs.

The hospital administrator gave permission for conducting the study. In lieu of formal ethical board approval, the principles of Helsinki's declaration were followed. Data was coded and confidentiality was ensured. For this type of study, formal consent is not required, the head of the department gave permission for the study and use of records.

Statistical Analysis

Data were entered and analyzed using SPSS 15. Qualitative variables were represented by percentages and frequencies. Bivariate analysis was conducted to assess the association of socio-demographic characteristics with the time of first visit (occurred within the first 3 months or 14 weeks of pregnancy) and content of care received. A bivariate analysis was done using chi-square and binary logistic regression. Multivariable regression was also run to determine predictors of late booking taking variables that had p-values <0.25 in the univariate model. P-value less than or equal to 0.05 was taken statistically significant in a final regression model.

RESULTS

Sociodemographic and Clinical Characteristics

During the study period, 1388 women delivered at the hospital and satisfied the inclusion criteria. Most women (n= 602, 43%) were of 25-29 years of age, parous (1149, 82.8%), had no formal education (634, 45.7%) and belonged to households with less than 10,000 PKR monthly income. Only 450 (32.4%) of them had 4 or more visits and only 160 (11.5%) of them had their first visit before 3 months of pregnancy. Table **1** summarizes the characteristics of the study population.

Table 1: Characteristics of population.

Characteristics		Frequency (%)
Age range	less than 19 years	38 (2.7)
	20-24 years	438 (31.6)
	25-29 years	602 (43.4)
	30-34 years	258 (18.6)
	35 and above	52 (3.7)
Parity	nulliparous	239 (17.2)
	parous	1149 (82.8)
Educational status	graduate	66 (4.8)
	No formal education	634 (45.7)
	primary	434 (31.3)
	secondary	254 (18.3)
Monthly income	less than 10,000 PKR	812 (58.5)
	between 10,000-40,000 PKR	476 (34.3)
	more than 40,000 PKR	100 (7.2)
Booked	<4 visits	938 (67.6)
	≥4 more visits	450 (32.4)
Time of visit	<14 weeks*	160 (11.5)
	≥14 weeks	1228 (88.5)

*Gestational age in weeks

Table 2: Timing of antenatal care and content of care received.

Content of Care	Groups	Total (%)	Time of Visit		
			<14 weeks	≥14 weeks	p-value
			n (%)	n (%)	
Blood pressure measurement	yes	1161 (83.6)	144 (90.0)	1017 (82.8)	*0.021
	no	227 (16.4)	16 (10.0)	211 (17.2)	
Weight measurement	yes	1011 (72.8)	130 (81.3)	881 (71.7)	*0.011
	no	377 (27.2)	30 (18.8)	347 (28.3)	
Counselling of Danger signs	yes	931 (67.1)	118 (73.8)	813 (66.2)	0.056
	no	457 (32.9)	42 (26.3)	415 (33.8)	
Urine testing	yes	941 (67.8)	122 (76.3)	819 (66.7)	*0.015
	no	447 (32.2)	38 (23.8)	409 (33.3)	
Tetanus toxoid	yes	1055 (76.0)	127 (79.4)	928 (75.6)	0.289
	no	333 (24.0)	33 (20.6)	300 (24.4)	
Iron and folic supplementation	yes	1143 (82.3)	143 (89.4)	1000 (81.4)	*0.013
	no	245 (17.7)	17 (10.6)	228 (18.6)	

* The Chi-square statistic was significant at the 0.05 level of significance

Content of Care Received and Time of Initiating Care

With regards to the content of care, blood pressure was measured for 1161 (83.6%) women, while 1143 (82.3%) received iron and folic acid supplementation. Only 67.1% were counseled about the dangerous signs of pregnancy. When stratified according to time of visit, blood pressure measurement (p=0.021), weight measurement (p= 0.011), urine testing (p=0.015) and iron and folic acid supplementation (p=0.013) were significantly greater for women who started care within three months (**Table 2**).

Association of Initiation with Sociodemographic Characteristics

Women who were older (p<0.001) and had delivered before (p=0.001) were more likely to access antenatal care earlier. Similarly, women with some education (p

Table 3: Effect of sociodemographic characteristics on time of initiating antenatal care.

Variables	Time of Visit		p-value
	<14 weeks n(%)	≥14 weeks n(%)	
Age range			
less than 19 years	29 (18.1)	9 (0.7)	
20-24 years	21 (13.1)	417 (34.0)	
25-29 years	87 (54.4)	515 (41.9)	**<0.001
30-34 years	15 (9.4)	243 (19.8)	
35 and above	8 (5.0)	44 (3.6)	
Parity			
Nulliparous	12 (7.5)	227 (18.5)	**0.001
Parous	148(92.5)	1001 (81.5)	
Educational status			
Graduate	61 (38.1)	5 (0.4)	
No formal education	58 (36.3)	576 (46.9)	**<0.001
primary	34 (21.3)	400 (32.6)	
Secondary	7 (4.4)	247 (20.1)	
Monthly income			
less than 10,000 PKR	79 (49.4)	733 (59.7)	
between 10,000-40,000 PKR	60 (37.5)	416 (33.9)	**0.003
more than 40,000 PKR	21 (13.1)	79 (6.4)	

**Significant at p<0.01

<0.001) and higher monthly income (p=0.003) started visits sooner than those who were uneducated and had lesser income (**Table 3**).

When binary logistic regression was conducted to assess the association of time on starting care; women aged 20-24 years were 3.5 times more likely than women aged 35 or more to visit late. Nulliparous women were 2.6 times more likely to present later than their parous counterparts. Similarly, women with low monthly income were 2.4 times more likely to attend after three months than women with higher monthly income. Women who had no formal education were 1.6 times more likely to initiate care later than educated women (**Table 4**).

Table 4: Association of sociodemographic characteristics with late booking (≥ 14 weeks of pregnancy).

Variables	Adjusted Odds Ratio (95% CI)	p-value
Age Range		
Less than 19 years	0.056(0.019-0.168)	**0.001
20-24 years	3.541(1.437-8.724)	**0.006
25-29 years	1.060(0.470-2.392)	0.889
30-34 years	2.385(0.923-6.163)	0.073
35 and above	Reference category	
Parity		
Nulliparous	2.658(1.364-5.179)	**0.004
Parous (reference)	Reference category	
Educational Status		
No formal education	1.632(1.109-2.402)	*0.013
Some education	Reference category	
Monthly Income		
Less than 10,000 PKR	2.475(1.330-4.604)	**0.004
Between 10,000-40,000 PKR	1.962(1.045-3.681)	*0.036
More than 40,000 PKR	Reference category	

CI: Confidence interval, *Significant at p<0.05, **Significant at p<0.01

DISCUSSION

The study shows that women who start prenatal care early receive lower content of care as compared to those who are seen late. Content varies significantly in terms

of blood pressure measurement, blood testing, testing of urine, and prescription of iron and folic acid.

The time of initiation is strongly associated with being older, parous, educated and having a higher monthly income. Women who have delivered at least once are significantly keen on starting prenatal care early in their next pregnancy.

Antenatal care is of paramount importance in preventing adverse pregnancy outcomes. Late initiation and reduced number of visits (4 or less) have been linked to preterm births and low birth weight [6]. However other studies have shown that if the content of care remains adequate, the number of visits does not matter [7]. Adequacy is judged by the preventive, treatment and screening strategies that are employed during the visits [8].

The coverage of antenatal care has improved considerably in recent times. The first step in care is contact with a health professional. The coverage is widely calculated in terms of the number of visits. But it is the quality of care and content she receives that matters. The approach that takes only visits into consideration fails to address the critical gaps in healthcare delivery [9]. Though the coverage in the country is around 78% [3], in our study just 32.4% of women had the required number of visits and only 11.5% initiated visits within three months. This shows the inadequacy of both coverage in general and the time of seeking care. These findings are much lower than the findings from Ethiopia where 46.8% start care early [10] and from Nepal [11] where 70% have their first appointment before 3 months.

Commonly cited determinants for poor utilization include lack of education, younger age and poverty. Education, in particular, affects women's autonomy [12]. Our analysis showed that women who were educated initiated care earlier. This finding is in agreement with Guliani *et al.* who reported that education is a significant determinant of early initiation of care [13]. Our multivariable analysis showed that women with no formal education are less likely to initiate antenatal care earlier than women who have some education.

Pregnancies in adolescent girls (15-19 years) account for about one-tenth of all births. These young girls are more likely to suffer an adverse pregnancy outcome [14]. In our study, such girls started prenatal care earlier than their older counterparts. These findings are in contrast with the findings reported from Kenya [15] and India [16]. Our logistic regression confirmed that those aged 19 or less are less likely to start antenatal care late. This shows a better understanding of the community in terms of care required by such young women.

Studies show that knowledge about antenatal care is associated with more visits and an early visit to the healthcare facility [17]. Parous women however are also shown to present earlier than women who have never been pregnant. In our study among those who booked early, 92.5% had delivered before. This trend is opposite to that reported from Ethiopia and Tanzania where parous women feel more confident and present later [10, 18]. The earlier initiation in our study could be attributed to the knowledge imparted to these women during the care of their previous pregnancies. The regression analysis proved that parous women are 3 times more likely to initiate care early.

A recent analysis highlights the fact that though about two–thirds of women attend antenatal care 1-9% receive all interventions considered necessary for antenatal care [8]. This can also be due to the fact content received by women antenatally varies with a point of entry into care. This partly has to do with the way antenatal care is arranged according to trimesters. Folic acid supplementation starts periconceptually and continues for three months [19]. It is considered a preventive low-cost measure for reducing congenital defects in babies. Women who present late miss this opportunity. In our study women who booked late were less likely to have received this supplementation. Though this could be due to the arrangement and chronology of content, these late presenters missed out on a preventive component because of the timing of initiating care. In contrast to the folic acid supplementation that starts early, tetanus toxoids are administered from 7 months. Late presenters are more likely to receive tetanus toxoid and miss out on folic acid prescriptions. In our study more women who booked early received supplementation (89.4% *vs.* 81.4%, p=0.013) whereas tetanus toxoid administration (76% *vs.* 79.4%, p= 0.289) was not significantly different between late initiators and early initiators. This further cements the importance of early initiation of care during pregnancy.

Effective antenatal care coverage requires not only attendance but also service provision [20]. Blood testing, urine testing, blood pressure and weight measurement are screening components of antenatal care. They require supplies and lab test kits. Women who book early are likely to have more visits and lack of supplies may be compensated at a subsequent visit. Testing also requires access to a laboratory and report collection, women having lesser visits and later visit suffer more [21]. Proper and prompt arrangements of screening facilities can be of great help for women who present late in this regard. In our study women who presented early received screening strategies more commonly than late presenters. An area that requires administrative input and calls for improved resources.

Our study has a large sample size and could be considered representative of the general population. However, the retrospective design can lead to some bias. We included WHO recommendations for a time of visit and content of care to ensure a comparison of care received.

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The major limitation is that only documented care was included in the analysis. Undocumented tests and targeted tests based on clinical acumen may have been missed. Effective coverage indicators may change depending upon the decision of policymakers.

Our study highlights the need for improvement in antenatal care utilization, as both numbers of visits and time of initiating care are below the recommended standard. Awareness programs for women are needed. All women of the reproductive age group who come into contact with a healthcare professional should be educated about the benefits and content of care even before pregnancy. Interventions to prevent late presentation to antenatal clinics are necessary to ensure better utilization of service. In addition, antenatal care clinics should be well equipped with supplies and lab kits so that service provision is also improved.

CONCLUSION

The prevalence of early initiation of antenatal care was very low. Older age, previous birth, education and monthly income were determinants of early antenatal care visits. The content of care received by women who presented early was also significantly different from those who presented late. Awareness programs for early initiation of care need to be implemented.

ETHICS APPROVAL

The study used data records of the patients who delivered. The study used retrospective data. Instead of a formal ethics committee approval, the principles of Helsinki's Declaration were followed. Data was coded and confidentiality was ensured. The Head of the department granted permission for the study.

CONSENT FOR PUBLICATION

Informed verbal and written consent was obtained from the patients.

AVAILABILITY OF DATA

Data sets generated or analyzed during the current study are not made public because the authors are concerned about the confidentiality of the patients. Data sets can be released upon request to the corresponding author.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

AUTHOR'S CONTRIBUTION

SH and SHA designed the study and came up with the concept. RI contributed to data acquisition and statistical analysis. ZM, SHA and RI contributed to draft writing.

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