



PROFILE OF ANTENATAL CARE AMONG PREGNANT WOMEN ATTENDING OUTPATIENT CLINICS IN A RURAL BASED MEDICAL COLLEGE

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Antenatal care (ANC) provides monitoring and regular follow-up of maternal and fetal health during pregnancy. Women with appropriate ANC tend to have uneventful delivery and birth outcomes. This study describes the patterns of ANC care provided in a tertiary care rural teaching hospital. **Methods:** Baseline cross-sectional data from pregnant women who attended the ANC clinic at GITAM Institute of Medical Sciences and Research, Rushikonda, Visakhapatnam between May 2017 and January 2019 was analyzed. All the participants enrolled in the study completed a self-administered questionnaire in the regional language. The data collected were socio-demographic and pregnancy-related information. Regression models assessed the relationship between socio-demographic and pregnancy-related variables and "appropriate" (≤ 4 months' gestation) vs. "late" ANC initiation (>4 months' gestation). **Results:** At enrolment, 841 participants reported that it was their first ANC visit and half (50.2%) of the women attending were late i.e. > 4 months gestation in registering for their ANC. Mothers who were more educated, had previous infertility treatment or previous miscarriages were all more likely to achieve appropriate ANC initiation [adjusted odds ratio (aOR): 1.66, 95% confidence interval (CI): 1.05–2.62; aOR: 3.68, 95% CI: 1.50–9.04; aOR: 1.80, 95% CI: 1.16–2.79, respectively]. Women with anxieties about childbirth were less likely to achieve appropriate ANC initiation (aOR: 0.54, 95% CI: 0.34–0.85). **Conclusion:** Half of the pregnant women in this study did not achieve the global consensus guidelines on appropriate ANC initiation. Better counselling for the less educated women and those with previous pregnancy complications and childbirth anxieties are recommended to ensure appropriate ANC initiation and better outcomes.

KEYWORDS

Birth; Cohort; Prenatal Care,

INTRODUCTION

Antenatal care (ANC) is the care provided by skilled healthcare professionals to women throughout their pregnancy. It includes risk identification and screening, prevention and management of pregnancy-related or concurrent diseases, health education and promotion. Global guidelines recommend periodical visits during the antenatal period to decrease the risk of maternal and perinatal mortality and morbidity. Women who make regular visits at the ANC clinics are seen to benefit in terms of reduced complications and a healthier pregnancy, due to close monitoring of fetal and maternal health. The World Health Organization (WHO) recommends that ANC should be initiated within the first trimester of gestation with at least four, and optimally eight visits during the pregnancy. Specifically, the WHO advises pregnant women to initiate contact during the first 12 weeks' gestation, with subsequent visits at 20, 26, 30, 34, 36, 38, and 40 weeks' gestation (1,2).

Late initiation of antenatal care is considered for those who register in the second trimester, (13th weeks) or later (3). Epidemiological studies have correlated the number of prenatal visits or gestational age at ANC initiation, and pregnancy outcomes (4). Late ANC registration often leads to poorer outcomes, such as low birth weight and preterm birth (5,6); it has a greater adverse effect than the frequency of visits, on influencing outcomes (7,8). This subset of women are usually younger, higher parity or gravidity, without a partner, lower socioeconomic status, less educated, and have lower access to health services (9). Women who have unplanned pregnancies, usually recognize their pregnancy late. If they experienced no complications in previous pregnancies, they tend to postpone seeking ANC. Women also defer seeking ANC if the quality of services is perceived as poor or their previous experiences were negative (10).

This study has attempted to evaluate the timing of ANC initiation, and analyse the factors associated with late ANC initiation in the catchment area of the rural medical college at Visakhapatnam. The patterns of appropriate utilization of ANC and the associations between various socio-demographic and pregnancy-related variables and appropriate (≤ 4 months' gestation) versus late ANC initiation (>4 months gestation) was studied.

MATERIALS AND METHODS

This is a prospective cross sectional cohort study analysing the baseline data from pregnant women attending the ANC outpatient at GITAM Institute of Medical Sciences and Research, Rushikonda, Visakhapatnam between May 2021 and January 2023. All pregnant women above 18 years of age, able to provide informed consent were considered eligible to participate in the study and recruited via consecutive sampling. The study group of women completed a short

questionnaire to collect data on demographics, psychosocial factors, and previous pregnancies. The demographic and pregnancy-related characteristics included maternal education, employment, and age, number of people living in the house; number of previous pregnancies (gravidity), number of children (parity), complications in previous pregnancies including low birth weight, miscarriages, stillbirth and preterm births, gestational age, pregnancy planning status, maternal and paternal smoking status, consanguinity, perceived social support, and childbirth anxiety. They were then followed up through their pregnancy until their offspring's first birthday.

Statistical Analyses

Descriptive statistics to show and compare the distribution of characteristics of the study population by ANC initiation status was applied. Continuous variables were presented as means and standard deviations, while categorical variables as counts and percentages. Student *t*-tests were used to determine differences between group means for continuous variables (e.g., maternal age) and Pearson Chi-square tests were used for categorical variables (e.g., maternal education). Univariate and multivariate regression models were used to quantify the association between the different sociodemographic and pregnancy-related variables and ANC initiation. Backward stepwise multivariate analyses were performed with a removal criterion of $p \geq 0.10$. Crude and adjusted odds ratios (aOR) with 95% confidence intervals (CI) were calculated. Statistical analyses were performed using Stata 15.1 (Stata Corp, College Station, TX). A $p \leq 0.05$ defined statistical significance.

RESULTS

A total of 841 women enrolled between 25th May 2020 and 31st January 2023. Among these women, 1652 (97.3%) answered the question on whether it was their first ANC visit. Non-responders (2.7%) to the ANC question were not significantly different to responders in terms of age, number of pregnancies, or gestational age.

A total of 841 women who attended their first antenatal appointment ($n = 841$, 23.0%) were the focus of this paper. Out of these, 422 women (50.2%) were classified as late for ANC initiation (more than 4 months' gestation). Figure 1 illustrates the distribution of ANC initiation categories (appropriate and late) within age groups. The socio-demographic and pregnancy-related characteristics of the study participants are described in Table 1. There were no significant differences in sociodemographic characteristics between the two groups of ANC initiation. The distributions of previous infertility treatment, previous pregnancy and birth complications, and childbirth anxiety were significantly different between women with appropriate and late ANC initiation ($p \leq 0.05$). Six percent of those who initiated late reported previous infertility treatment as compared to 11.6% of

appropriate initiators. Similarly, for women who had previous miscarriages, the distributions were 45.6 and 35.6% for appropriate initiation and late initiation, respectively (Table 1).

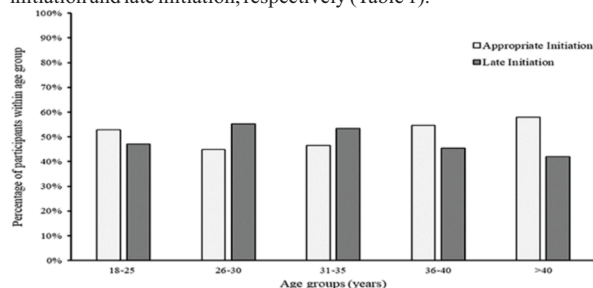


Figure 1. The distribution of ANC initiation categories (late and appropriate) among age groups in 841 pregnant women in GIMSR ANC Study.

Table 1. Characteristics of 841 pregnant women according to whether they were classified with “appropriate” or “late” anc initiation.

	Appropriate initiation (n=419)	Late initiation (n=422)	p
Age (years) †	31.1.0 + 6.2	30.6 + 5.9	0.325
Gestational age (months) †	2.0 + 0.8	6.4 + 1.6	<0.0001
No. of pregnancies†	3.8 + 2.3	3.6 + 2.1	0.239
First Child*			0.079
Yes	80 (44.4%)	100 (55.6%)	
No	335 (51.9)	311 (48.1%)	
Planned Pregnancy*			0.648
Yes	199 (50.5%)	195 (49.5%)	
No	199 (48.9)	208 (51.1%)	
Worrying about birth*			0.032
Yes	250 (47.4%)	278 (52.7%)	
No	150 (55.4)	121 (44.7%)	
Social support*			0.159
Yes	370 (51.1%)	354 (48.9%)	
No	31 (42.5)	42 (57.5%)	
Education*			0.085
High school and below	246 (60.0%)	267 (66.4%)	
Diploma and above	160 (39.4)	135 (33.6%)	
Empolymnt*			0.375
Employed	121 (29.8%)	119 (48.9%)	
Unemployed/Student	285 (70.2.5)	281 (70.3%)	
Number of people living in home*	11.8 + 8.8	10.7 + 9.0	
Previous gestational Diabetes Mullets			0.851
Yes	91 (23.0%)	93 (23.5%)	
No	305 (77.0%)	302 (76.59%)	
Consanguinity*			0.125
Yes (via parents)	166 (46.8%)	147 (41.1%)	
No	189 (53.2%)	211 (58.9%)	
Previous infertility treatment*			0.005
Yes	46 (11.6%)	24 (6.00%)	
No	350 (88.4%)	376 (84.0%)	
Previous miscarriage*			0.011
Yes	145 (45.6%)	106 (6.00%)	
No	173 (54.4%)	192 (84.0%)	
Previous stillbirth*			0.017
Yes	25 (8.1%)	10 (6.00%)	
No	285 (91.9%)	277 (96.5%)	
Previous low birth weight*			0.068
Yes	142 (46.6%)	109 (39.1%)	
No	163 (52.4%)	170 (60.9%)	
Previous premature baby*			0.230
Yes	58 (18.4%)	43 (6.00%)	
No	258 (81.7%)	149 (85.3%)	

*Missing data were excluded from the totals.

†Mean and standard deviation.

The associations between self-reported socio-demographic and

pregnancy-related factors and ANC initiation is depicted in Table 2. Women with previous birth complications such as miscarriages [odds ratio (OR): 1.52, 95% CI 1.10–2.10] and stillbirths (OR: 2.43, 95% CI 1.15–5.15), as well as women who had previous infertility treatment (OR: 2.06, 95% CI: 1.23–3.44) were more likely to initiate appropriately. Women who worried about giving birth were less likely to initiate on time (OR: 0.73, 95% CI: 0.54–0.97).

Table 2: univariate associations between self-reported socio-demographic and pregnancy-related factors and appropriate antenatal care initiation amongst pregnant women

	Unadjusted odds ratio (95% confidence interval)
Age	1.01 (0.99 – 1.04)
Education	1.29 (0.97 – 1.71)
Employment	1.01 (0.74 – 1.36)
Number of pregnancies	1.04 (0.97 – 1.12)
Planned pregnancy	1.07 (0.81 – 1.41)
Consanguinity	1.26 (0.94 – 1.70)
Social support	1.42 (0.87 – 2.30)
Worry about birth	0.73 (0.54 – 0.97)
Previous infertility treatment	2.06 (1.23 – 3.44)
Previous miscarriage	1.52 (1.10 – 2.10)
Previous stillbirth	2.43 (1.15 – 5.15)
Previous low birth weight baby	1.36 (0.98 – 1.89)
Previous preterm baby	1.30 (0.85 – 2.00)

Table 3: independent associations between self-reported socio-demographic and pregnancy-related factors and appropriate antenatal care initiation amongst pregnant women

	Adjusted* odds ratio (95% confidence interval)
Education	1.66 (1.05 – 2.62)
Previous infertility treatment	3.68 (1.50 – 9.04)
Previous miscarriage	1.80 (1.16 – 2.79)
Worry about birth	0.54 (0.34 – 0.85)

* Model adjusted for age, education, employment, previous birth complications, consanguinity number of pregnancies, infertility treatment, social support, worrying about birth, planned regency.

DISCUSSION

The baseline findings from this large population-based study provides an overview into the patterns of women's ANC initiation in our medical college. Women were inclined to initiate their ANC visits appropriately when they were more educated, had complications with previous pregnancies, and had previous fertility treatment. On the contrary, women with childbirth anxieties tended to initiate their visits later during pregnancy. Approximately 50% of study participants initiated ANC after the first 4 months of their pregnancy. Among the late ANC initiation group in this study, the average month of initiation was six, which is the end of the second trimester. Health issues such as gestational diabetes mellitus (GDM), anemia and pre-eclampsia are often diagnosed during the standard testing practices in the second trimester (11). If women only begin their ANC visits at 6 months, it is unlikely that timely and effective interventions for the above health issues will be provided before they cause adverse health outcomes in the mother or the child. GDM manifests even earlier in pregnancy and should therefore be tested earlier than the standard practice (12).

This study did not find any association between socio-demographic factors, except education, and ANC initiation. Educated pregnant women have better health seeking behaviours and 66% more likely to achieve appropriate initiation compared to less educated women. They tend to appreciate the importance of well-timed antenatal care (13). As educational level has shown to be independently associated with appropriate antenatal care initiation, it is pertinent to empower women with a lower educational status to initiate ANC as appropriately as possible. Educational level is linked to lower morbidity and better lifestyle factors (14). To ensure more favorable pregnancy and birth outcomes, appropriate ANC initiation must be promoted to sub-populations of pregnant women who may be less educated.(15)

This study shows a significant association between previous infertility treatment and an increased likelihood for appropriate ANC initiation. Nevertheless, one third of women with a history of infertility treatment still reported late ANC initiation. Appropriate prenatal screening and

counseling are of utmost importance for pregnant women with a history of infertility. Women suffering from infertility are often older, overweight, or have chronic conditions such as thyroid dysfunction. These pregnant women may also have a poor prognosis in terms of outcomes as sub-fertile women, even after adjusting for age and parity, can suffer from pre-eclampsia, placenta previa, and placental abruption, and are more likely to experience induction of labor and undergo cesarean section. Sub-fertile women are also at an increased risk of preterm delivery, low birth weight babies, and spontaneous pregnancy loss. Delays in initiating ANC can increase all of the above poor outcomes especially for a high-risk population such as women with infertility issues. Hence, it is vital that most of the women with infertility history were initiating appropriately. (16,17)

Women with previous miscarriages have been found to have better health-seeking behaviors and to be on time for their ANC. Appropriate ANC initiation is important for health care providers, as it allows for better monitoring of the fetus at an earlier stage as well as providing appropriate assistance for women with recurrent pregnancy losses. (18,19,20).

Women who were worried about childbirth have less positive expectations about their pregnancy and childbirth. Consequently, this can lead to negative associations between childbirth and fear of attending ANC. This can further perpetuate their childbirth anxiety and reflect as high tension and pain during labor (21). Antenatal care can enable women to develop the coping skills to replace negative attitudes with positive expectations toward labor and childbirth.

This study provides the first estimates of ANC initiation in a large representative sample of pregnant women in the city of Visakhapatnam.

CONCLUSION

Half of the study sample did not achieve the global consensus guidelines on ANC initiation and many pregnant women delayed ANC initiation until their third trimester. Level of education, history of previous infertility or previous exposure to miscarriages, and pregnancy-related anxiety were independently associated with ANC initiation. Appropriate interventions could be offered to ensure that women without previous pregnancy complications and those with childbirth anxiety initiate antenatal care earlier in their pregnancy.

Conflict of Interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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