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Research

A Study on Role of Antenatal Care in Pregnancy Outcome in Tertiary Health Care Centre, Hyderabad

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ABSTRACT

Background: Antenatal care (ANC) and regular antenatal visits are one of the interventions that have the potential to improve both maternal and child survival. The utilization of antenatal services remains less than 60% in India. The study aimed to find out the association between ANC visits and pregnancy outcome.

Subjects and Method: Cross-sectional study was conducted on 200 antenatal women in a tertiary care centre over a period of 3 months. After taking informed consent data was collected by interviewer technique using a pretested semi-structured questionnaire. Questionnaire includes information related to socio-demographic variables, number of ANC visits, delivery outcome (normal/ LSCS) low birth weight, stillbirths, and abortions. Thus, collected data was entered in excel and analyzed using epi info 7.22.6. The bivariate analysis was the chi-square test. Binary logistic regression was used to study the association between delivery outcome and its covariates. Logistic regression was also done to see the association between ANC visits and Low birth weight and stillbirths.

Results: Out of 59 women who had less than 4 ANC visits had more number of abortions (18.6%) (OR= 32.08; CI 95%= 4.03 to 255.07; p<0.001), low birth weights (52.5%) (OR= 4.46; CI 95%= 2.31 to 8.62; p= 0.001), still births (8.5%) (OR= -1.00; CI 95%= -1 to -0.001 p=0.001), out of 22 illiterate mothers 16 of them had poor pregnancy outcomes (p= 0.002) and first ANC visit during first trimester had less complications (p <0.001). Binary logistic regression revealed significant association between delivery outcome and Socio-economic status (OR= 2.14; CI 95%= -1.47 to 3.13; p<0.001) as well as frequency of ANC visits (OR= 0.65; CI 95%= 0.55 to 0.77; p<0.001). Significant association was also observed between ANC visits and Low birth weight (OR= 0.52; CI 95%= -0.43 to 0.62; p <0.001). Logistic regression between ANC visits and stillbirths/abortion showed significant association (OR= 0.36 (CI 95%= -0.23 to 0.55; p<0.001).

Conclusion: The study shows that less than 4 ANC visits, illiteracy increases the risk of poor pregnancy outcome. Women who had their first ANC visits during first trimester had less complications.

Keywords: antenatal care, pregnancy outcomes, socio-demographic factors.

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BACKGROUND

Antenatal care (ANC) is an essential component of primary healthcare in our country and its importance has now expanded worldwide (Kuhnt and Vollmer, 2017). Antenatal care and regular antenatal visits are one of the interventions that have the potential to improve both maternal and child

survival. Antenatal care (ANC) offers a set of services that can prevent as well as detect and treat risk factors early in the pregnancy.

High-risk pregnancies can be detected by analyzing the socioeconomic, medical and obstetrical factors which is a key element of ANC (Khatib et al., 2009). It is also often used as a platform for additional interventions that have been shown to positively influence the maternal and child health status, such as immunization and nutrition programmers and breastfeeding counselling, or to educate women about the possibilities of family planning and birth spacing (Kumar et al., 2019).

The utilization of antenatal services remains less than 60% in India. Mothers who availed full antenatal care in Telangana is only 42.1% (National Family Health Survey (NFHS-4) 2015-16, 2017) HO recommends a minimum of 4 antenatal visits for uncomplicated pregnancies (Ntui et al., 2014). Antenatal check-ups helps to identify women who are at risk and help to prevent the complications (Gupta and Talukdar, 2017). The aim of the study was to find out the socioeconomic profile of antenatal women and the association of ANC visits and pregnancy outcome.

SUBJECTS AND METHOD

1. Study design

Cross-sectional study was done at a tertiary healthcare Centre, Hyderabad from October 2019-January 2020.

2. Population and Sample

A sample of 200 antenatal women were selected who came for delivery to a Tertiary health care centre, Hyderabad over a period of 3 months using convenient sampling technique. Sample size was calculated using the formula $4pq/l^2$, where {p= 42.1 (mothers who had full ANC care according to NFHS4), q= 57.9, L (absolute error) = 7%} came to 198 rounded up to 200.

3. Study Variables

Dependent variables were type of delivery (Normal/ LSCS), low birth weight, delivery outcome (live/ still-birth/ abortion). Independent variables were socio-demographic variables including age, education, socio-economic status, frequency of ANC visits.

4. Operational Definition of variables

Delivery outcome: Outcome of delivery was categorized into normal vaginal delivery and caesarean section (LSCS) based on the mode of delivery at the time of child birth.

Age: Measured by calculating the time elapsed from date of birth.

Education: It was categorised as illiterate, primary, secondary, intermediate and graduate.

Socio-economic status: Modified Kuppuswamy classification was used to assess the socio-economic status.

ANC visits: Frequency of ANC visits were noted as per the records present. Number of visits was categorized as 0, 1, 2, 3, and >4 visits.

Birth weight: <2.5 kgs was considered as low birth weight and categories include <2.5, 2.5-2.9,3-3.5,>3.5 kgs.

5. Study Instruments

The importance of the study was explained to the mothers in their local language and informed consent was taken. Data was collected by interviewer technique using a pretested predesigned semi structured questionnaire which was tested by doing a pilot study on 25 antenatal women and necessary changes were made after the pilot study.

Inclusion Criteria: Antenatal women who came to Tertiary health care centre in Hyderabad who gave informed consent for the study was included in the study.

Exclusion Criteria: Antenatal women who did not give consent for the study.

6. Data Analysis

The data was entered in a Microsoft Excel sheet and imported into Epi Info version

7.2.2.6 for analysis. Unadjusted odds ratios (ORs), chi square test with 95% Confidence Intervals (CIs) were done for the association between ANC components and ANC attendance with adverse pregnancy outcomes were estimated by logistic regression. All tests were two tailed and $p < 0.05$ were considered statistically significant.

7. Ethics Clearance

Ethic clearance approve in Institutional Ethics Committee, Osmania Medical College.

RESULTS

Mean age of study participants was found to be Mean= 23.9; SD= 3.49 years. A sample of 105 (52.5%) of them lived in rural area and 95 (47.5%) in urban area. Out of the total 200 antenatal women more than half of the study participants 112 (56%) belong to the age group 21-25 years. Majority 68 (34%) of the women completed secondary education, 155 (77.5%) were unemployed, 96 (48%) belong to Hindu religion,116 (58%) were living in nuclear family and 78 (39%) of the mothers belong to socio economic class IV according to Modified Kuppuswamy classification. Most of them 191 (95.5%) were married after 18 years (Table 1).

Table 1. Sociodemographic Profile of Antenatal Women

Characteristics	Category	Frequency (n)	Percentage (%)
Age	Less than or equal to 20	37	18.5
	21-25 years	112	56.0
	26-30 years	41	20.5
	>30 years	10	5.0
Education	Primary education	52	26.0
	Secondary education	68	34.0
	Intermediate education	20	10.0
	Graduates	37	18.5
	Illiterates	23	11.5
Occupation	Employed	45	22.5
	Unemployed	155	77.5
Religion	Hindu	96	48.0
	Muslim	67	33.5
	Christian	37	18.5
Type of family	Nuclear family	116	58.0
	Joint family	84	42.0
Socio economic class	Class I	18	9.0
	Class II	29	14.5
	Class III	55	27.5
	Class IV	78	39.0
	Class V	20	10.0
Residential status	Rural	105	52.5
	Urban	95	47.5
Age at marriage	<18 years	9	4.5
	≥ 18 years	191	95.5

The number of antenatal visits by study participants were (Mean= 5; SD= 2.9) ranging from 0 to 13 visits. Majority of the women 96 (48%) had 4-7 ANC visits, 59 (29.5%) of them had less than 4 visits, 45 (22.5%) of them had 8-13 antenatal visits during their antenatal period. Among the total participants 96 (48%) initiated their antenatal check-ups during 2nd trimester of their pregnancy,60 (30%) had their first

antenatal check-up during 1st trimester while 37 (18.5%) enrolled to antenatal care during 3rd trimester and 7 (3.5%) were of no visit category (Table 2).

Table 2. Frequency and Initiation of Antenatal Check-ups

Variables	Frequency (=n)	Percentage (%)
Total number of visits		
<4 visits	59	29.5
4-7 visits	96	48.0
8-13 visits	45	22.5
Initiation of antenatal check-ups		
1st trimester	60	30.0
2nd trimester	96	48.0
3rd trimester	37	18.5
No antenatal check-ups	7	3.5

Majority 123 (61.5%) delivered via spontaneous vaginal delivery while 60 (30%) underwent LSCS and 17 (8.5%) had assisted labour/ abortion. Pregnancy outcome among the study participants are as follows, 183 (91.5%) of them gave birth to live babies; remaining 12 (6%) were abortions and 5 (2.5%) were still births. Mean birthweight of the newborn was 2.66 ±0.79 kgs. Majority 69 (37.7%) of the newborn lie within range of 2.5 – 2.9 kg birthweight and only two (1.1%) were of the birth weight >3.5 kg (Table 3).

Table 3. Delivery Outcome

Variables	Frequency (N)	Percentage (%)
Type of delivery		
LSCS	60	30.0
Normal Vaginal Delivery	123	61.5
Assisted delivery/ abortions	17	8.5
Delivery outcome		
Live birth	183	91.5
Still Births	5	2.5
Abortions	12	6.0
Birthweight (n=183)		
<2.5 kg	59	32.2
2.5 - 2.9 kg	69	37.7
3 - 3.5 kg	53	28.9
>3.5 kg	2	1.1

Out of the total 200 participants, 76 (38%) had adverse pregnancy outcome. Mean age of the study participants with adverse outcomes was Mean= 23.87; SD= 3.5 years. Among them 9 (11.8%) were in the category of no antenatal visits, 10 (13.1%) had one ANC visit, 16 (21.1%) had two antenatal visits, 12 (15.8%) had three and 29 (38 %) had ≥4 ANC visits (Table 4).

Table 4. Antenatal Visits of Women with Adverse Outcome (low birthweight, abortions, still births)

Number of visits	Frequency (n)	Percentage (%)
0 visits	9	11.8
1 visit	10	13.1
2 visits	16	21.1
3 visits	12	15.8
≥4 visits	29	38.0
Total	76	100.0

Out of 59 women who attended less than 4 ANC visits 11 (18.6%) had abortions (OR= 32.08; CI 95%= 4.03 to 255.07; p= 0.001), 31 (52.50%) had low birth weight babies (OR=4.46, CI 95%= 2.31 to 8.62, p= 0.001), and 5 (8.50%) experienced still births (OR= -1; CI 95%= -1 to -1, p= 0.001}. Abortions, low birth weights and still births were found to have statistically significant association with the frequency of ANC visits (Table 5).

Out of the total 23 illiterate mothers 16 had poor pregnancy outcomes (OR= 9.5; p=0.002) which was statistically significant, and those participants who initiated their first ANC visit during first trimester had less adverse pregnancy outcomes (p <0.001, x^2 =26.85) (Table 5).

Table 5. Pregnancy outcome of women with inadequate ANC Visits (N= 59)

Variable		Abortions		Low Birth Weight		Still Births		Normal Outcome	
		N (%)	OR (CI 95%)	N (%)	OR (CI 95%)	N (%)	OR (CI 95%)	N (%)	OR (CI 95%)
ANC visits (<4)	No	48 (81.4)	32.08 (4.03 to 255.07)	28 (47.5)	4.46 (2.31 to 8.62)	54 (91.5)	0.01 (-1 to -1)	47 (79.6)	0.06 (0.03 to 0.14)
	Yes	11 (18.6)		31 (52.5)		5 (8.5)		12 (8.5)	

Based on Table 6 showed that binary logistic regression was used to study the association between delivery outcome (Normal/ LSCS delivery) and its co-variates including Age, Education, Socio-economic status and ANC visits. Significant association was observed with socio-economic status (OR= 2.14; CI 95%= 1.47 to 3.13; p<0.001) and ANC visits (OR= 0.66; CI 95%= 0.56 to 0.77; p= 0.001).

Table 6. Binary logistic regression showing association between delivery outcome and its co-variates

Variable	OR	Delivery outcome (Normal/ LSCS)		
		95% CI		p
		Lower limit	Upper Limit	
Age	1.01	0.65	1.56	0.973
Education	1.02	0.75	1.37	0.919
SES	2.15	1.47	3.14	<0.001
ANC Visits	0.66	0.56	0.77	<0.001
N observation =200				
-2 log likelihood = 195.01				
Negelkerke R^2 = 37%				

Binary logistic regression between ANC visits and Low birth weight revealed significant association (OR= 0.52, CI 95%= 0.43 to 0.62, p= 0.001) (Table 7).

Binary logistic regression between ANC visits and stillbirths/ abortion revealed

significant association (OR= 0.36; CI 95%= 0.23 to 0.55, p= 0.001) (Table 8).

Table 7. Binary logistic regression showing association between ANC visits and Low birth weight

Independent variable	OR	95% CI		p
		Lower limit	Upper limit	
ANC Visits N observartion = 200 -2 log likelihood = 181.59 Negelkerke R^2 = 46%	0.52	0.43	0.62	<0.001

Table 8. Binary logistic regression showing association between ANC visits and still-births/ abortion

Independent Variable	OR	95% CI		p
		Lower limit	Upper limit	
ANC Visits N observation = 200 -2 log likelihood = 69.94 Negelkerke R^2 = 47%	0.36	0.23	0.56	<0.001

DISCUSSION

This study was conducted to find out the sociodemographic factors of antenatal women and their association with pregnancy outcome and also association between antenatal visits and poor pregnancy outcome. Majority (56%) of women were of the age group 21-25 in this study which was similar to studies done by (Kumar et al., 2016; Blondel et al., 1993).

In this study 67% women availed minimum recommended antenatal services which was in contrast with study conducted by Nazli et al. (2009) in the district of Wardha, Maharashtra were they found only 33.6% women availed minimum recommended antenatal services among 267 study participants (Khatib et al., 2009). Study done by Kumar (2019) found 51.6% had minimum of 4 ANC visits. Our study has higher percentage of women availing minimum recommended antenatal services (Kumar et al., 2019). A study done by Felix et al. (2019) in India showed 51.7% of women had four or more visits (Ogbo et al., 2019).

Initiation of antenatal check-ups during first trimester definitely had an impact on pregnancy outcome. In this study only 30% of women initiated their antenatal check-ups during first trimester 70% failed to initiate during first trimester which can be due to lack of accessibility, availability or lack of knowledge about the services. According to NFHS4 data, 83.1% mothers had initiated antenatal check-ups in first trimester in Telangana, (National Family Health Survey (NFHS-4) 2015-16, 2017) which was lightly more than our study findings. Study done by Shekhawat et al. (2018) in Jaipur showed that 72% of women initiated their ANC visits during first trimester (Shekhawat et al., 2018).

Women who had initiated their antenatal check-ups during their first trimester had less complications during their pregnancy. Study done by Barrick et al. (2008) in North India showed among the women who initiated ANC visits after first trimester 58.1% had unwanted pregnancy outcome (OR= 1.15; CI 95%= 0.82 to 1.62) (Barrick et al., 2008). Majority of women (61.8%, 47 out of 76) who had adverse pregnancy outcome had less than four antenatal check-ups. 48% of them had 4-7 ANC visits, 29.5% of them

had less than 4 visits, 22.5% of them had 8-13 visits during their antenatal period. 29.5% of the new born were underweight (<2.5 kg), 6% of them were abortions, 2.5% were still births. Women who had less than 4 ANC visits had a greater number of abortions (p= 0.005) low birth weights (p= 0.001), still births (p= 0.001).

Study conducted in Wardha district of Maharashtra showed a significant relation between poor pregnancy outcome and not availing recommended antenatal care. Study done by Barrick et al. (2008) showed 70.3% of women without minimum ANC visits had unwanted pregnancy outcome (OR= 0.72; CI 95%= 0.59 to 0.89) (Barrick and Koenig, 2008). This was in accordance with a study in Aligarh where they found a significant association was found between LBW and number of antenatal visits. LBW was found among half the pregnant females with less than 4 antenatal visits (50.8%) whereas it was found in only one-third (33.3 %) of females with more than 4 antenatal visits (Juneja et al., 2016). Similar findings were seen in study done by Yeoh et al. (2018). In this study mother's education was one of the most important factors which had a significant relation (p= 0.002, x^2= 9.5). with pregnancy outcome. Similar findings were found in study done by Shekhawat et al. (2018) in Jaipur (p= 0.001). Study done by (Raatikainen et al., 2007) and study done by (Ilesanmi et al., 2012) where mothers education was related to pregnancy outcome.

In this study 0.45% women got married before legal age of marriage,18 years which was lightly less than a study conducted in Wardha which had less than 2% of women who were married before the legal age of marriage (Kuhnt and Vollmer, 2017).

In the present study Binary logistic regression showed significant association between delivery outcome and socio-economic status (p= 0.001) as well as frequency of ANC visits (p= 0.001). Non-significant association was observed with age (p= 0.97 and education (p= 0.92).

In a study done by (Harrison et al., 2020) on risk factors of adverse maternal outcome, adjusted analyses revealed decreased risk of the adverse maternal outcome associated with intrapartum caesarean birth who had four or more antenatal visits (p = 0.003), which was consistent with our study. In the same study, Women who had less education (0–6 years) (vs. 13+ years; (p = 0.01), were obstetrically high risk (vs. not high-risk p < 0.0001) which was in contrast to the present study which showed insignificant association with education

Significant association was also observed between ANC visits and Low birth weight (p<0.001) (Zhou et al., 2019) analysis showed that children whose mothers who did not receive five ANC visits had a higher risk of LBW than those whose mothers had received it (aOR= 1.32; CI 95%= 1.01 to 1.73).

In this study, logistic regression between ANC visits and stillbirths/ abortion showed significant association (p= 0.001). In a previous study by Gupta et.al, newburns whose mother had 7-9 visits was 0.48 (CI95%= 0.28 to 0.83) times fewer odds of dying in the neonatal period compared to a new-born whose mothers had no antenatal visits. There was a significant association between 7-9 ANC visits and neonatal mortality in crude and adjusted ORs(Gupta and Talukdar, 2017). The study showed that less than 4 ANC visits, illiteracy increases the risk of poor pregnancy outcome. Women who had their first ANC visits during first trimester had less complications. Efforts like awareness programs and health education should be given to encourage the use of ANC facilities to promote maternal and new born health and survival. Limitation of this study was that it was a hospital-based study and

all the antenatal women who came to hospital was included in the study.

AUTHOR CONTRIBUTION

Akhila K, S wrote this article. Prasanth Kumar and Kenche Bhavani reviewed and analyzed the research results.

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None.

CONFLICT OF INTERESTS

None.

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