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An Observational Study to Find Impact of Maternal Age at First Pregnancy on Maternal and Perinatal Outcomes

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Abstract

Introduction: Maternal age plays a vital role in pregnancy outcome. It has an impact on pregnancy outcomes at both ends of the reproductive spectrum (less than 20 years and more than 35 years). With the change in fertility policy and socio-economic development, maternal age at childbearing has dramatically changed worldwide in the past decades. So the purpose of the study is find association between maternal age at first pregnancy and adverse fetomaternal outcome so that it will help to provide targeted surveillance, close supervision during antepartum and intrapartum period and timed obstetrical intervention so as to improve pregnancy outcome

Methods: This observational study was conducted in Department of Obstetrics & Gynecology, in a tertiary care institute located in central India, over a period of 12 months. 250 primigravida women in different age groups were studied in terms of maternal and perinatal outcome. Data was studied and statistically analysed.

Results: Women > 35 years were more likely to have Abruptio placentae (25%), Placentae previa (8.3%), preeclampsia (33.3%), eclampsia (8,3%), Gestational Diabetes Mellitus (8.3%), LBW (33.3%), APGAR (33.3%) whereas women <25 years were more likely to have Anemia ((24.4%), LBW (11%), APGAR<7(17.1%), NICU Admission of their babies (16.5%) and perinatal mortality (5.4%)

Keywords: Maternal age, perinatal outcome, maternal outcome

Introduction

WHO defined teenage pregnancy as any pregnancy from a girl who is 10 to 19 years of age, during which individual reproductive maturity is acquired. Approximately 90% of the teenage births occur in developing countries. Early marriage is a long-established custom in India. Factors contributing to the high teenage pregnancy rate in our country are early marriage, social custom, low literacy rate, lack of sex education and non-usage of contraceptive services. There

is a lack of information about the importance of avoiding pregnancy during the teenage.5 Girls who marry young usually have less autonomy to influence decisions about delaying childbearing and using contraceptives, which increases their risk of becoming pregnant.

Second, the lack of opportunities for education and jobs often leads girls to decide to become pregnant. (1) Young mothers are exposed to an increased risk of anaemia, low birth weight, fetal death, eclampsia and preterm birth although, at the same time, they were more likely to have a spontaneous normal vaginal birth and the risk of preeclampsia and postpartum haemorrhage (PPH) were significantly decreased. These adverse outcomes are influenced by biological immaturity, unintended pregnancy, inadequate perinatal care, poor maternal nutrition and stress. (2)

On the other extreme, the elderly primigravida is a woman who goes into pregnancy for the first time at the age of 35 years or more.(3) Pregnant women of 35 years or more are considered high risk due to increased maternal and perinatal morbidity and mortality.15 Advanced maternal age at birth has been found to be associated with gestational diabetes, preeclampsia, placenta previa, caesarean section (CS), abnormal foetal presentation, placental abruption, preterm delivery, low birth weight, intrauterine growth retardation, intrauterine fetal death, neonatal complications and increased perinatal mortality.(4-6)

Over the past several decades there has been a rising trend among women towards delaying pregnancy and childbirth all across the world, this trend is observed universally, irrespective of race and economic status. (7) Effective birth control, advances in assisted reproductive technology (ART), delayed marriage, increasing rates of divorce followed by remarriage, and women's pursuit of higher education and career advancement and financial security all contribute to this trend. (810)

The majority of studies report an association between advanced maternal age and adverse pregnancy like preterm delivery, low birth weight, perinatal death, and caesarean section. (1113). There are some studies, however, that fail to demonstrate such unfavourable conclusions. (1416).

Material And Method

Study Type: Descriptive type of Observational study

Study Design: Hospital based Prospective study

Place of Study: Department of Obstetrics & Gynaecology, SMS Medical College, Jaipur

Duration of Study: From November 2022 to November 2023 (after taking the approval from institutional review board of ethical committee).

Sample Size: Sample size is calculated at 80% study power and alpha error of 0.05, of 250 pregnant mother as found in the seed article.

Study Universe: All pregnant women admitted in labour room in department of obstetrics & Gynaecology of SMS Medical College

Study Population: Primigravida with live pregnancy of >28 weeks period of gestation

Inclusion Criteria

- Primigravida with live pregnancy of >28weeks period of gestation
- Who understand and are Willing to participate and give informed & written consent
- Not participating in other study

Methods: Demographic and Anthropometric data was collected from each participant at the time of the initial check-up and it included Age, Religion, Literacy and Socioeconomic status, booking status, and residence. Gestational age at delivery, Antepartum haemorrhage, Preeclampsia, Eclampsia, Gestational Diabetes, PROM,

Anaemia, and Need for induction were also noted. Women were monitored throughout labour till delivery and the mode of delivery was noted as normal vaginal delivery, caesarean section and instrumental vaginal delivery. The foetal outcomes were measured as Birth weight, APGAR score, NICU admission, and any perinatal mortality was also noted. Maternal and perinatal outcome was noted till the time of discharge.

Observations and Discussion

- Women < 25 years were 1.8 times more at risk of abruptio placentae [1.8250; (0.2005 to 16.6156), p -0.5], 1.3 times more at risk of GDM [1.3602 (0.1391 to 13.2994), p-0.7], 1.8 times more at risk of developing eclampsia [1.8250 (0.2005 to 16.6156), p-0.5935], 1.2 times more at risk of anaemia [1.2688 (0.6496 to 2.483), p-0.4] and 1.1 times more likely to undergo vaginal delivery [1.1064 (0.6295 to 1.9448), p-0.7]. Age below 25 years is protective for placenta previa [0.4410 (0.0869 to 2.2385), p-0.3], pre-eclampsia [0.7955 (0.3599 to1.7581), p- 0.5], PROM [0.8082 (0.4542 to 1.4382), p-0.490] and induction of labour [0.6735 (0.3877 to1.1700), p-0.1],
- Women >35 years are 24 times more likely to have abruptio placentae [24.3333; (2.2821 to 259.4639), p-0.008], 2.15 times more at risk of having placenta previa [2.1515 (0.2051 to22.5742), p-0.5], 6.6 times more at risk of GDM [6.6364 (0.3864 to 113.9761), p-0.1], 2.8 times more at risk of pre-eclampsia [2.8636 (0.7347 to11.1623), p-0.1], 1.4 times more at risk of having induction of labour [1.4000 (0.4072 to 4.8129), p-0.5] and 1.17 times more likely to have vaginal delivery

Table 1:

Age Groups (Years)	Abruptio placentae		ODD Ratio
	Yes	No	
<25	4	160	1.8250; (0.2005 to 16.6156), p -0.5
25-35	1	73	1
>35	3	9	24.3333; (2.2821 to 259.4639), p-0.008
	Placenta Previa		Odds ratio
	Yes	No	
<25	3	161	0.4410 (0.0869 to 2.2385), p-0.3232
25-35	3	71	1
>35	1	11	2.1515 (0.2051 to22.5742), p-0.5229

[1.1735 (0.3396 to 4.0554), p-0.8]. Age >35 years is protective for PROM [0.5802, (0.1446 to 2.3290), p – 0.3] and anaemia [0.3576 (0.042 to 2.9914), p-0.3].

In the present study incidence of abruptio placentae was significantly higher in women above 35 years of age (p – 0.000) which is comparable with observations of Deeksha DM et al.106 In their study incidence of abruptio placentae was significantly higher in women above 35 years of age (p – 0.000). Placenta previa occurred in 8.3% of the women above 35 years and the difference in the occurrence of placenta previa was not significant in different age groups (p – 0.3) while Deeksha DM et al106 observed that placenta previa was significantly more in women above 35 years of age (p – 0.006).

Table 2:

Age Groups (Years)	GDM		ODD Ratio
	Yes	No	
<25	3	161	1.3602 (0.1391 to 13.2994), p-0.7914

25-35	1	73	1
>35	1	11	6.6364 (0.3864 to 113.9761), p- 0.1920
Age Groups (Years)	Pre-eclampsia		Odds ratio
	Yes	No	
<25	3	161	0.7955 (0.3599 to1.7581), p-0.5717
25-35	3	71	1
>35	1	11	2.8636 (0.7347 to11.1623), p-0.1296
Age Groups (Years)	Ecla npsia		Odds ratio
	Yes	No	
<25	4	164	1.8250 (0.2005 to 16.6156), p- 0.5935
25-35	1	73	1
>35	1	11	6.6 (0.3864 to 113.9761), P0.1920

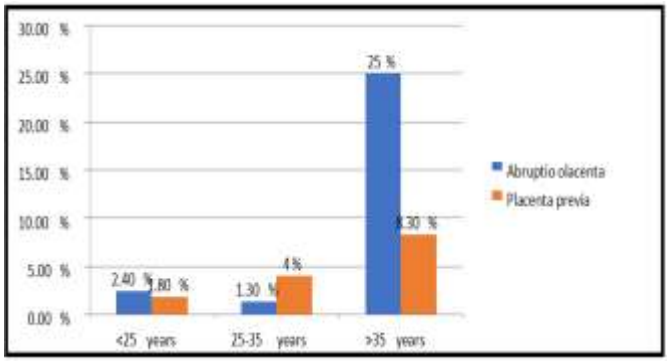
In the present study women >35 years of age were more likely to have pre-eclampsia which is comparable with those of other studies done in Northern Ethiopia, Spain, and South Korea. (17-19) This finding can be associated with other risks of preexisting medical conditions and sedentary life.

In the present study, GDM was observed in 8.3% of women above 35 years of age and there was no significant difference in the occurrence of GDM in different age groups (p – 0.2) which is in contrast with the observation made by Deeksha DM et al(20)where 14% woman above 35 years developed GDM and there was a significant difference in the occurrence of GDM in different age groups (0.01).

The need for induction was slightly greater in women above 35 years of age though there was no significant difference in the need for induction in different groups this is in contrast with the observation made by Ramachandran N et al where induction of labour was done in 4.76% women above 35 years of age. (7)

Out of 250 women included in the study, 151 women (60.4%) had a vaginal delivery and 39.6% women had caesarean delivery. 59.7% of women below 25 years, 62.2% of women between 25 to 35 years and 60.4% of women above 35 years had vaginal delivery. 40.3% of women below 25 years, 37.8% of women between 25 to 35 years and 39.6% of women above 35 years had caesarean delivery. There was no statistical difference in the three groups (X2=1.1459, P - 0.9). The incidence of caesarean section in women above 35 years (41.7%) was lower than 61.9% observed by Ramachandran N et al. (7)

Graph 1:



Graph 2:

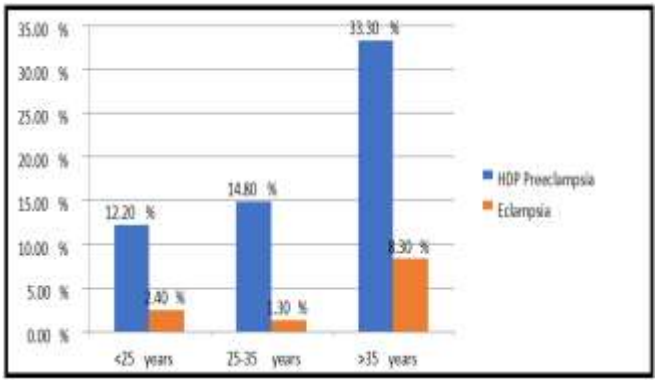


Table 3:

Age Groups (Years)	P ROM		ODD Ratio
	Yes	No	
<25	52	112	0.8082 (0.4542 to 1.4382), p-0.490
25-35	27	47	1
>35	3	9	0.5802, (0.1446 to 2.3290), p – 0.3
Age Groups (Years)	Anaemia		Odds ratio
	Yes	No	
<25	40	124	1.2688 (0.6496 to 2.483), p-0.4858
25-35	15	59	1
>35	1	11	0.3576 (0.042 to 2.9914), p-0.3427

Age Groups (Years)	Induction of Labour		ODD Ratio
	Yes	No	
<25	66	98	0.6735 (0.3877 to1.1700), p-0.1607
25-35	37	37	1
>35	7	5	1.4000 (0.4072 to 4.8129), p-0.5933
Age Groups (Years)	Mode of delivery		Odds ratio
	VD	CS	
<25	98	66	1.1064 (0.6295 to 1.9448), p-0.7253
25-35	46	28	1
>35	7	5	1.1735 (0.3396 to 4.0554), p-0.8004

Women <25 years of age were 1.4 times more likely to have LBW babies [1.3973 (0.5309 to3.6775), p-0.4], 2.3 times more likely to have APGAR <7 [2.3333 (0.9220 to5.9053), p-0.07],

1.4 times more likely to have NICU admission of babies [1.4234 (0.6331 to3.1999), p-0.3930] and

1.3 times more likely to have perinatal mortality [1.3742 (0.3611 to5.2298) p-0.6].

The percentage of women having APGAR Scores of their babies <7 was significantly more in women above 35 years of age (X2=6.395, P - 0.04) which is in line with a study done by Ramachandran N et al (7) where the incidence of APGAR score <7 was significantly more in women above 35 years of age which was secondary to placental abruption and meconium passage.

The result of the present study does not correlate with a study done by Deeksha DM et al106 regarding NICU admission. In their study, 64% of babies of women above 35 years were admitted to NICU compared to 8.3% in the present study.

Joseph et al75 reported a 46% increased incidence of perinatal morbidity and mortality among women aged >35 years while Ramachandran N et al (7) reported no perinatal mortality.

Table 4:

Age Groups (Years)	Birth Weight		ODD Ratio
	LBW	ABW	
<25	18	146	1.3973 (0.5309 to3.6775), p-0.4981
25-35	6	68	1
>35	4	8	5.6667 (1.3134 to 24.4486), p-0.0200
Age Groups (Years)	APGAR Score		Odds ratio
	<7	≥7	
<25	28	136	2.3333 (0.9220 to5.9053), p-0.0737
25-35	6	68	1
>35	4	5	5.6667 (1.3134 to 24.4486), p-0.0200
Age Groups (Years)	NICU Admission		
	Yes	No	
<25	27	137	1.4234 (0.6331 to3.1999), p-0.3930
25-35	9	65	1
>35	1	11	0.6566 (0.0755 to 5.7079), p-0.7030
Age Groups	Perinatal Mortality		
<25	9	155	1.3742 (0.3611 to5.2298) p-0.6411
25-35	3	71	1
>35	1	11	2.1515 (0.2051 to 22.5742), p-0.5229

Conclusion

In this study majority of women were young (<25 years), Hindu, resident of rural area, illiterate, belonging to middle socioeconomic status and admitted as un-booked cases. Women > 35 years were more likely to have Abruptio placentae, Placentae previa, pre-eclampsia, eclampsia, Gestational Diabetes Mellitus, LBW, APGAR<7 and perinatal mortality whereas women <25 years were more likely to have Anemia, LBW, APGAR<7, NICU admission of their babies and perinatal mortality. These findings suggest that maternal age is a significant factor influencing both maternal and perinatal outcomes, with higher risks observed at both younger and older maternal ages. This highlights the importance of tailored antenatal care and monitoring for women at the extremes of reproductive age.

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