**Original Research Article**

# AN OBSERVATIONAL STUDY TO ASSESS THE MATERNAL AGE ON OBSTETRIC AND NEONATAL OUTCOME AT NEWLY ESTABLISHED TERTIARY CARE CENTRE

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**ABSTRACT**

**Background:** Pregnancy at extremes of age can be very challenging. The reflex of a woman to pregnancy is influenced by various factors through which woman's age at pregnancy time can be known as the single most important factor that has undeniable effect on pregnancy process and labour. Both adolescent and elderly pregnancy are considered to be high risk as they have unique outcomes. There is a need for individualization of the antenatal surveillance programmes and obstetric care based on different age group in order to improve the outcomes. India, with its growing population needs to address this issue with all possible measures. The aim of this study to assess the maternal age on obstetric and neonatal outcome at newly established tertiary care centre. **Materials & Methods:** A hospital based prospective study was conducted on 300 primiparous women who attended antenatal clinic at Government Medical College, Barmer, Rajasthan, India during one-year period. A detailed history regarding maternal age, period of gestation, development of any signs and symptoms of various co-morbidities is taken and antenatal examination is done. Routine antenatal investigations were done and all the cases were followed till delivery. Development of various maternal co-morbidities, mode of delivery and neonatal outcome was assessed. **Results:** In our study, maximum number of patients were between age group 20 to 34 years (72%), number of teenage mothers were 60 (20%), and elderly primi were 24 (8%). 6.66% of teenagers had previous history of miscarriage. It was higher in elderly mothers, 41.66%. In normal age group previous abortion was 15.75%. Association of abortion with maternal age is statistically significant (p<0.05*) (table 1). Association of gestational age, hypertension with maternal age is statistically significant (P <0.05*, P<0.05* respectively). Anaemia was seen in 3.33% of teenagers, 4.16% advanced maternal age, 3.7% in age group 20 to 34 years, which was statistically non-significant. Association of mode of delivery with maternal age is statistically significant (p<0.05). PPH among elderly mothers was 12.5%, and age group 20 to 34 years 12%, and teenagers had 10% of PPH. Association of outcome of baby is statistically significant (p<0.05*). **Conclusion:** Teenage pregnancy is an essential public health issue as it is associated with poor maternal and foetal outcome. Advanced maternal age has positive impact on pregnancy outcome due to high socio- economic status and planned pregnancy, but they are more likely to have chronic medical conditions which can have an adverse outcome in pregnancy.

## INTRODUCTION

Maternal age is defined as the age of the mother in completed years at the time of delivery.[1] Reproductive age is the interval from the age of menarche to the chronologic age at conception,[2] whereas gynaecologic age is the time span from the age of menarche to the chronologic age at delivery.[2] With the improvement of socioeconomic conditions, the median age of menarche has shown a downward trend. It ranges from 12.5 years in developed countries to more than 15 years in poorly developed

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countries.[3] Childbirth is one of the most awaited and cherished events in the life of a woman wherein she steps into a world of creation i.e. motherhood. The physiological transition from being pregnant to becoming a mother is an enormous emotional and physical accomplishment for the women and her family. Pregnancy and labour is an enigma and complications may arise at any stage that may threaten the life of the mother and the foetus.

Women at both ends of the reproductive-age spectrum have unique outcomes to be considered. Caring and management of such pregnancies can be challenging.

Maternal age is a crucial factor influencing pregnancy outcomes, with both younger and older maternal ages associated with increased risks for adverse obstetric and neonatal outcomes. In primiparous women, the age-related risks may be particularly pronounced due to the physiological and psychosocial adjustments required during the first pregnancy. Advanced maternal age, commonly defined as 35 years and older, is associated with increased risks of gestational hypertension, preeclampsia, gestational diabetes, and caesarean delivery. There are a large number of studies evaluating obstetric and neonatal outcome over the full range of reproductive maternal ages, especially with a focus on the youngest and the oldest mothers. Young mothers have been shown to be 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.[4-9]

Pregnancies at AMA are associated with more complications and adverse outcomes than pregnancies at younger ages like increased risk of hypertension, diabetes mellitus, subfertility, miscarriage, ectopic pregnancy, anemia, antepartum hemorrhage, malpresentation, postpartum hemorrhage, increased incidence of caesarean sections. Fetal and neonatal risk is also high due to increased incidence of chromosomal abnormalities (mainly Down's syndrome), multiple pregnancy, IUGR, prematurity leading to higher number of NICU admission. The aim of this study to assess the maternal age on obstetric and neonatal outcome at newly established tertiary care centre.

## MATERIALS AND METHODS

A hospital based prospective study was conducted on 300 primiparous women who attended antenatal clinic at Government Medical College, Barmer, Rajasthan, India during one year period.

**Inclusion Criteria:**
1. Pregnant women who were willing to give written and informed consent.
2. All primiparous women in the age group 18 to 45 years were considered in this study.

**Exclusion Criteria**
1. Previous ectopic pregnancy.
2. Chronic cases of DM, HTN, Thyroid disorders and Epilepsy.

**Methods**
All the primiparous women who attended the antenatal clinic were assessed from their first visit. A detailed history regarding maternal age, period of gestation, development of any signs and symptoms of various co-morbidities is taken and antenatal examination is done. Routine antenatal investigations were done which include CBC, HIV, HbsAg, VDRL, Blood grouping and typing, OGCT, TFT, Urine routine and USG-Obstetrics. Development of various maternal co-morbidities like Gestational Hypertension, Preeclampsia, Eclampsia, Gestational diabetes, Oligohydraminos and Polyhydraminos, Anemia, Post-partum haemorrhage, Placenta previa and Abruptio placenta are assessed; mode of delivery- normal vaginal delivery, instrumental delivery or caesarean section are noted. Neonatal outcomes in terms of APGAR score at 1 and 5 minutes and NICU admissions are assessed.

**Statistical Analysis:**
Data was entered into Microsoft excel data sheet and was analysed using SPSS 21 version software. Categorical data was represented in the form of Frequencies and proportions. P value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

## RESULTS

In our study, maximum number of patients were between age group 20 to 34 years (72%), number of teenage mothers were 60 (20%), and elderly primi were 24 (8%). 6.66% of teenagers had previous history of miscarriage. It was higher in elderly mothers, 41.66%. In normal age group previous abortion was 15.75%. Association of abortion with maternal age is statistically significant (p<0.05*) (table 1). Association of gestational age, hypertension with maternal age is statistically significant (P <0.05*, P<0.05* respectively).

In our study, GDM was present in 7.66%; In teenage mothers 1.66% and in elderly mothers 25% Association of GDM with maternal age is statistically significant (P<0.05*). Anaemia was seen in 3.33% of teenagers, 4.16% advanced maternal age, 3.7% in age group 20 to 34 years, which was statistically non-significant.

In our study, 48.33% of teenage mothers delivered vaginally and 51.66% of them delivered by cesarean section. In age group 20 to 34 years, vaginal delivery was 50.46% and caesarean delivery was 49.53%. Whereas in elderly primis the rate of cesarean delivery was 70.84% and vaginal delivery was 29.16%. Association of mode of delivery with maternal age is statistically significant (p<0.05) (table 1). PPH among elderly mothers was 12.5%,

and age group 20 to 34 years 12%, and teenagers had 10% of PPH.

In our study teenagers, term babies were 78.33%, pre-term babies were 13.33%, IUGR babies were 6.66% and IUD 1.66%. In advanced maternal age; term babies were 75%, pre-term was 8.33%, IUGR were 12.5% and IUD were 4.16%. Association of outcome of baby is statistically significant (p<0.05) (table 2).

**Table 1: Distribution of different variables among study subjects based on age group**

| | | Age groups | | | P-value |
|---|---|---|---|---|---|
| | | 17 to 19 years (n=60) (20%) | 20 to 34 Years (n=216) (72%) | ≥35 Years (n=24) (8%) | |
| Abortion | Absent | 56 (93.33%) | 182 (84.25%) | 14 (58.33%) | <0.05* |
| | Present | 4 (6.66%) | 34 (15.75%) | 10 (41.66%) | |
| Gestation in weeks | <28 | 1 (1.66%) | 1 (0.46%) | 1 (4.16%) | <0.05* |
| | 28-36 | 7 (11.66%) | 8 (3.7%) | 3 (12.5%) | |
| | 37-40 | 46 (76.66%) | 180 (83.33%) | 17 (70.83%) | |
| | >40 | 6 (10%) | 27 (12.5%) | 3 (12.5%) | |
| PIH | Absent | 51 (85%) | 187 (86.57%) | 14 (58.33%) | <0.05* |
| | GHTN | 5 (8.33%) | 24 (11.11%) | 8 (33.33%) | |
| | Pre-Eclampsia | 3 (5%) | 5 (2.31%) | 2 (8.33%) | |
| | Eclampsia | 1 (1.66%) | 0 (0%) | 0 (0%) | |
| GDM | Nil | 59 (98.33%) | 200 (92.25%) | 18 (75%) | <0.05* |
| | GDM-A2 | 0 (0%) | 11 (5%) | 4 (16.66%) | |
| | GDM- A1 | 1 (1.66%) | 5 (2.3%) | 2 (8.33%) | |
| Anaemia | Present | 2 (3.33%) | 8 (3.7%) | 1 (4.16%) | 0.873 |
| | Absent | 58 (96.66%) | 208 (96.3%) | 23 (95.84%) | |
| Mode of delivery | Vaginal | 29 (48.33%) | 109 (50.46%) | 7 (29.16%) | <0.05* |
| | Caesarean | 31 (51.66%) | 107 (49.53%) | 17 (70.84%) | |
| PPH | Present | 6 (10%) | 26 (12%) | 3 (12.5%) | 0.786 |
| | Absent | 54 (90%) | 190 (88%) | 21 (87.5%) | |

**Table 2: Distribution of Outcome of Baby among study subjects based on age group**

| | | Age Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | 17 to 19 years | | 20 to 34 years | | ≥35 years | |
| | | Frequency | % | Frequency | % | Frequency | % |
| Baby Outcome | IUD | 1 | 1.66% | 2 | 0.92% | 1 | 4.16% |
| | IUGR | 4 | 6.66% | 12 | 5.5% | 3 | 12.5% |
| | PRETERM | 8 | 13.33% | 12 | 5.5% | 2 | 8.33% |
| | TERM | 47 | 78.33% | 190 | 88% | 18 | 75% |

## DISCUSSION

Pregnancy at extremes of age can be very challenging. The reflex of a woman to pregnancy is influenced by various factors, through which women's age at pregnancy time can be known as the most important factor that has undeniable effect on pregnancy process and labour.[2]

Teenage pregnancy is recognized as a significant problem of public health. As more and more women postpone childbearing upto the age of 35 years the impact on maternal and perinatal outcomes becomes increasingly relevant.

Teenage pregnant women in our study were 20% comparable with Talukdar et al[10] who reported 14.2% and Bakwa-Kanyagi F et al[11] who reported 17.7% of adolescent mothers. Yasmin et al[12] and Rashmi et al[13] reported lower rates of teenage pregnancy (5.1% and 5.5%). This difference might be due to population age difference, socio-economic status, level of education, age at marriage and contraception awareness. Also due to the fact that not all teenagers attend hospital for delivery. All of the teenage mothers in our study were married.

Elderly mothers in our study were 8%. Other studies reported lower incidence of advanced maternal age women; Talukdar et al[10], 2.6%, Ojule et al[14] 4.7%.

Pegu et al[15] reported higher incidence of 17.8%. Effective birth control, advances in assisted reproductive technology, delayed marriage, increasing rates of divorce and remarriage, and women 's pursuit of higher education and career advancement all contribute to increasing trend of pregnancy at advanced age.

The percentage of teenage pregnant women who underwent miscarriage in our study was 6.66%; Yasmin et al[12] reported higher abortion rates in teenagers, 85.24%.

In elderly mothers, 41.66% had miscarriage in our study population which is comparable with Cleary-Goldman et al[16] 39.5%. Bayrampour H et al[17] and Rajput et al[18] reported lower incidence; 22.6% and 10% respectively. The increased incidence of abortion in this age group can be secondary to chromosomally or structurally anomalous foetus. Association of abortions with maternal age is statistically significant (p<0.05).

In our study, anemia in teenage mothers was 3.33%. In other studies, incidence being as high as 79.2% reported by Rita D et al[19] and 70% by J Bindal et al.[20] This may be due to poor nutrition in young women.

In our study population anemia was 4.16% in elderly mothers, similar to Rajput N et al[18] study of 4.86%. In other studies; Verma V et al[21], it is 18.8%;

Bloomberg et al[22] it is 1.85%. The increased incidence of pregnancy-induced hypertension is largely explained by nulliparity.[2] Proposed physiology for pre-eclampsia in adolescent mothers is that legitimate menstrual preconditioning among adolescent mothers is absent, which interfere with the procedure of decidualization and trophoblastic intrusion that increases the risk of defective deep placentation.

In advanced maternal age, pre-eclampsia was 8.33% comparable with teenage group (5%). Talukdar et al[10] reported 7.6% incidence of pre-eclampsia in advanced age. Bloomberg et al[22] and Kahveci et al[23], 2.95% and 8.45% respectively.

In our study Gestational Diabetes was 25% in older mothers. Kahveci et al[23] reported 15.75% of GDM in elderly. It is believed that with aging there is reduction in the function of β cells and insulin sensitivity of cells and more dysfunctional lipid profile metabolism leading to development of diabetes.[24]

Preterm delivery in advanced maternal age in our study was 8.33%; Aghamohammadi et al[25] reported 21.2%, and Rajput N et al[18] reported 6.25%. It is found that iatrogenic cause associated with advanced maternal age like chronic HTN, DM, Antepartum hemorrhage increase the incidence of preterm delivery. Malpresentation and multiple pregnancy also contribute to this. Association of gestational age at delivery with maternal age is statistically significant (p<0.05).

In our study older mothers who delivered vaginally were 29.16%; Kahveci et al[23] reported 53.8%. In advancing age labour becomes difficult due to rigid perineum and less reserve power of uterine contractions due to reduced number of oxytocin receptors. Endothelial dysfunction and impaired uterine contractions in advancing age can lead to inadequate uterine and utero-placental function. Association of mode of delivery with maternal age is statistically significant (p<0.05).

PPH among older mothers in our study was 12.5%, comparable to Rajput N et al[18], which reported 9%. Due to poor myometrial function, there is atonicity leading to post-partum haemorrhage.

Babies born to teenage mothers are more likely to be born preterm and hence are low birth weight. Few explanations proposed for such adverse outcome include biological immaturity which could lead to preterm birth, itself is an inherent risk factor for poor outcome and even adequate prenatal care does not completely eliminate this risk. Association of baby outcome with maternal age is statistically significant (p<0.05).

## CONCLUSION

Teenage pregnancy is an essential public health issue as it is associated with poor maternal and foetal outcome. Advanced maternal age has positive impact on pregnancy outcome due to high socio- economic status and planned pregnancy, but they are more likely to have chronic medical conditions which can have an adverse outcome in pregnancy. Therefore, elderly mothers should be offered prenatal screening and prenatal diagnosis, targeted anomaly scan, liberalization of ante-partum services to ensure safe motherhood and healthy foetus. Elderly mothers should receive ante-natal care in tertiary health centers to minimize maternal and foetal morbidity and mortality. Hence, individualization of antenatal surveillance based on age groups is necessary to improve the outcome.

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