



**FETAL OUTCOME OF PREGNANCIES IN WOMEN AT THE EXTREMES OF MATERNAL AGE**

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## ABSTRACT

**Background:** Extremes of maternal age adversely affect pregnancy outcomes. Teenage pregnancy is regarded as a serious public health problem and often occurs in the context of poor social support and maternal well-being. Teenage pregnancy is known to be associated with adverse pregnancy outcomes such as preterm births, low birth weight deliveries and increased risk of caesarean delivery. **Methods:** A hospital based prospective study carried out in the Department of Obstetrics and Gynaecology from October 2013 to September 2015 at Owaisi hospital and research centre and Princess Esra Hospital, a tertiary care centre, Deccan College of medical sciences, Hyderabad. **Results:** Among 8640 antenatal patients who delivered during the 24 months period i.e October 2013 to September 2015 at the hospital out of these 241(2.8%) were teenage primigravida aged 15 to 19 yrs. **Conclusions:** In India, 10.3% of the female population belongs to the age group of 15-19 years.<sup>[19]</sup> In 1997, the age specific fertility rate was found to be 52.5 live births per 1000 rural women aged between 15-19 years.<sup>[42]</sup> Over the years, there has not been much improvement in the country's scenario as reported by the National Family Health Surveys.

**KEYWORDS:** Pregnancy, Teenage, maternal outcome, pre term, caesarean.

## BACKGROUND

Extremes of maternal age adversely affect pregnancy outcomes.<sup>[1]</sup> Teenage pregnancy is regarded as a serious public health problem and often occurs in the context of poor social support and maternal well-being.<sup>[2]</sup> Teenage pregnancy is known to be associated with adverse pregnancy outcomes such as preterm births, low birth weight deliveries and increased risk of caesarean delivery.<sup>[1, 3]</sup> However, other studies have suggested that these effects are related to some other confounders. Two studies revealed that teenage mothers with adequate antenatal care and full social and family support does not show any increased risk of adverse pregnancy outcomes, and even had lower rates of caesarean delivery.<sup>[4, 5]</sup>

Teenage pregnancy, pregnancy within 19 years of age, is a public health concern both in developed and developing countries.<sup>[6, 7]</sup> Evidence in developing world indicates that one-third of women become mothers within 19 years of age.<sup>[8]</sup> Relatively the situation in India is severe as there are higher proportions of teenage pregnancies due to the common practice of early

marriage and social expectation to have a child soon after marriage.

Advanced maternal age, defined as age 35 years and older at estimated date of delivery, has become increasingly common.<sup>[9]</sup> Effective birth control, advances in assisted reproductive technology, delayed marriage, increasing rate of divorce and remarriage, and women's pursuit of higher education and career advancement all contribute to this trend.<sup>[10, 11]</sup> Mother's high age is always considered as a risk factor for pregnancy outcome.<sup>[12]</sup> Although many studies found an association between delayed childbirth and adverse maternal and fetal outcomes<sup>[1, 9, 13, 14, 15, 16]</sup>, one study challenges these findings.<sup>[17]</sup> This study was done to know the effects of both young and old maternal age on pregnancy and its outcome among women registered for prenatal care.

## AIMS AND OBJECTIVES

1. To determine the incidence of pregnancies in women at the extremes of maternal age (Teenage 15 to 19 yrs and elderly primi  $\geq 35$  to 41 yrs of age)

amongst antenatal patients registered at Owaisi hospital and research Centre and Princess Esra Hospital.

2. To study the maternal outcome at extremes of maternal age (Teenage 15 to 19 yrs and elderly primi  $\geq 35$  yrs to 41 yrs of age).
3. To study the fetal outcome and complications if any at extremes of maternal age, (Teenage 15 to 19 yrs and elderly primi  $\geq 35$  to 41 yrs of age).

## METHODOLOGY

### Source of data

The following study is a hospital based prospective study carried out in the Department of Obstetrics and Gynaecology from October 2013 to September 2015 at Owaisi hospital and research centre and Princess Esra Hospital, a tertiary care centre, Deccan College of medical sciences, Hyderabad. Informed consent was obtained from all cases after explanation of nature and purpose of study. The study was approved by the ethical committee of the hospital. 50 cases of younger primigravida (15 to 19 yrs) and 50 cases of elderly primigravida ( $\geq 35$  to 41 yrs), booked antenatal cases were selected after taking inclusion exclusion criteria into consideration.

### Inclusion criteria

1. Group I: 15 to 19 yrs
4. Group II:  $\geq 35$  to 41 yrs.
2. Primigravidae were taken in to account for the study, to eliminate influence of parity on maternal complications.
3. Singleton pregnancy.
4. Pregnancy complications like Anemia, Pregnancy induced hypertension, Gestational diabetes, Premature rupture of membranes, preterm labor, IUGR, Antepartum hemorrhage (placenta previa and abruptio placenta) in the two age groups were included.
5. Booked Cases at OHRC and PEH were included.

### Exclusion criteria

1. Multigravida
2. All pregnant women aged 20 to 34 yrs of age.
3. Multiple pregnancy.

The present study is a hospital based prospective study carried out in the department of Obstetrics and Gynecology from October 2013 to September 2015 at Owaisi Hospital and research Centre and Princess Esra Hospital, Deccan College of medical sciences, Hyderabad. Among 8640 antenatal patients who delivered during the 24 months period i.e October 2013 to September 2015 at the hospital out of these 241(2.8%) were teenage primigravida aged 15 to 19 yrs and 86 (1%) were elderly primigravida  $\geq 35$  yrs to 41 yrs.

Out of these after considering the inclusion and the exclusion criteria, 50 patients teenage primigravida 15 to 19 yrs and 50 patients elderly primi  $\geq 35$  yrs to 41 yrs and of age were enrolled for this hospital based prospective study.

## RESULTS

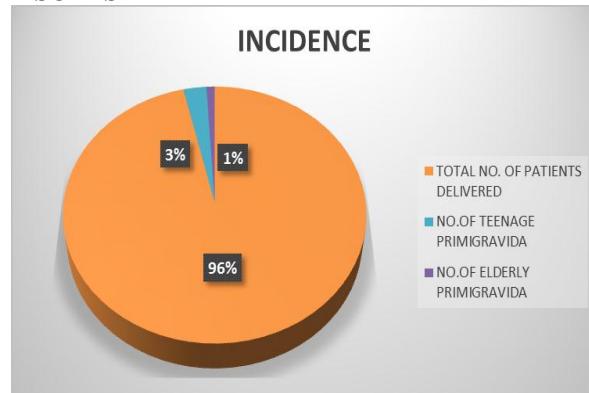


Figure 1: incidence of teenage primigravida and elderly primigravida.

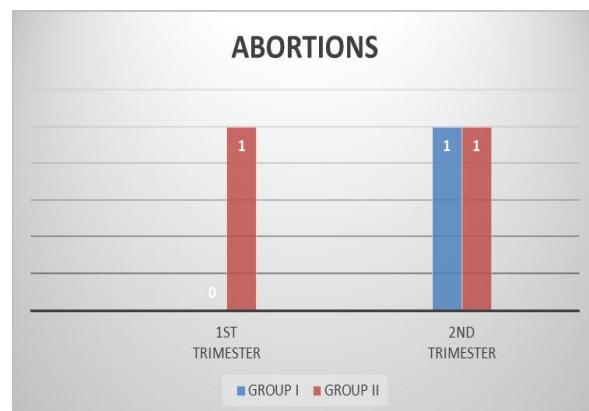
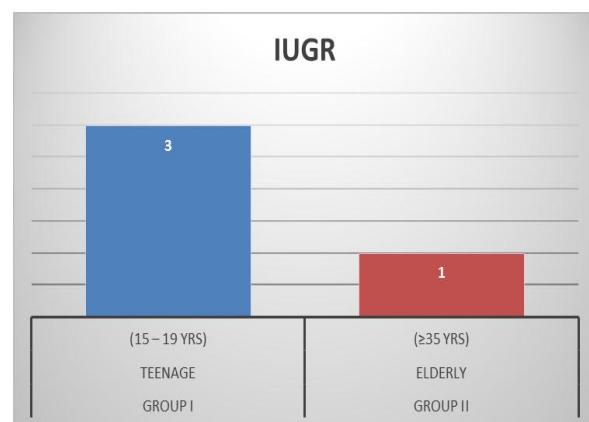
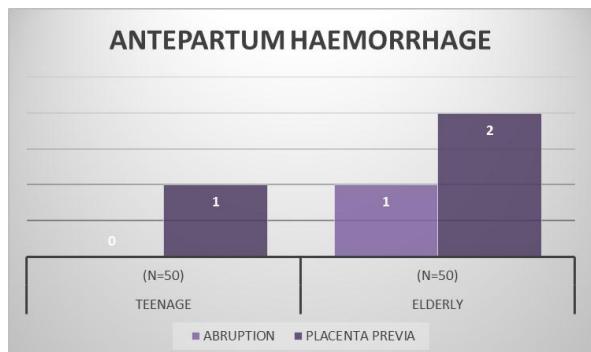


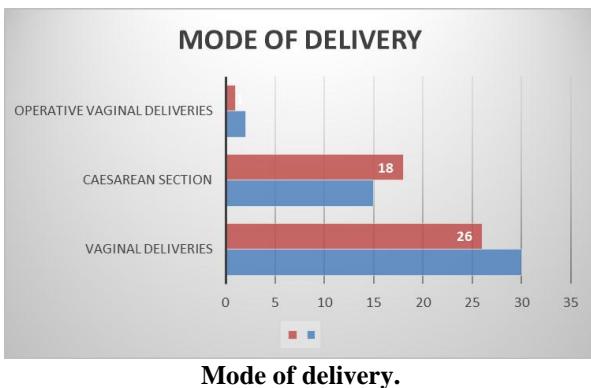
Figure 2: Incidence of abortions.



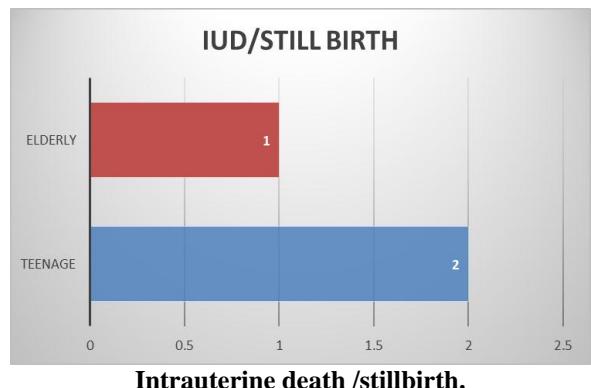
Prevalence of intrauterine growth restriction.



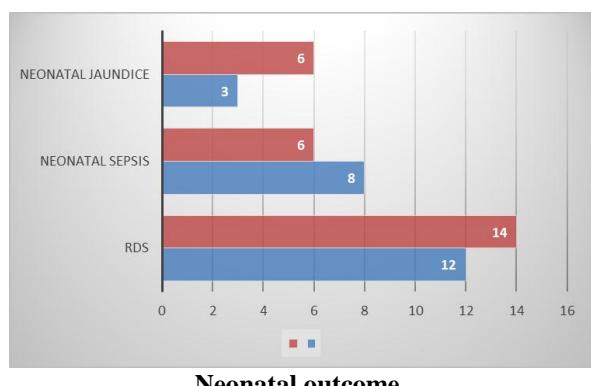
**Prevalence of antepartum haemorrhage (abruption/placenta previa)**



**Mode of delivery.**



**Intrauterine death /stillbirth.**



**Neonatal outcome.**

## DISCUSSION

Among 8640 antenatal patients who delivered during the 24 months period i.e October 2013 to September 2015 at the hospital out of these 241(2.8%) were teenage

primigravida aged 15 to 19 yrs and 86 (1%) were elderly primigravida  $\geq 35$  yrs to 41 yrs.

Out of these after considering the inclusion and the exclusion criteria, 50 patients  $\geq 35$  yrs to 41 yrs and 50 patients 15 to 19 yrs of age were enrolled for this hospital based prospective study.

In India, 10.3% of the female population belongs to the age group of 15-19 years.<sup>[18]</sup> In 1997, the age specific fertility rate was found to be 52.5 live births per 1000 rural women aged between 15-19 years.<sup>[19]</sup> Over the years, there has not been much improvement in the country's scenario as reported by the National Family Health Surveys 1, 2, and 3 where the median age at first birth for women aged 25-49 years was observed to be 19.4, 19.3, and 19.8, respectively.<sup>[20]</sup> The prevalence of teenage pregnancy in the study population is 2.8%, which lies near to the 3% to 52% range observed in India.<sup>[21, 22, 23]</sup> as illustrated in Figure 1.

In western world, the average age at which first time mothers give birth is continuously rising. From the year 1970-2007, live births among women with advanced maternal age in the US have increased from 5% to approximately 15%.<sup>[24, 25]</sup> The incidence of pregnancy at advanced maternal age was reported as 21% in US<sup>[26]</sup>, 33.4% in Norway<sup>[27]</sup> and as 17.5% from South Africa.<sup>[5]</sup> This trend seen in many countries may be due to women's choice but the scenario in our part of world is different. The incidence of pregnancy at advanced maternal age in this study is only 1% which is very less than that mentioned in above studies. This may be due to the fact that women here get married at early age lower socio economic status, illiteracy and complete childbearing early. Few women who get pregnant at advanced age do so not by their choice but due to various social reasons where pressure to have male child remains one important cause.

In our study majority of patients belong to lower socioeconomic status in both the teenage and the elderly primigravida i.e. 44% and 46% respectively. The risks observed among low socioeconomic status, illiterate population greatest for the very poor who have worse diets and the least opportunity for prenatal care. Under the economic conditions prevailing in rural India, coupled with poor utilization of health services, the problem of adolescent motherhood is linked with child survival and maternal mortality and morbidity.<sup>[28]</sup>

In our study the rate of abortions in the teenage is 2% and 4% in elderly. This was comparable to the study done in south India in 2015 where abortion rate 2.1% among the teenage group<sup>[29]</sup> study done in 2000 in the elderly reported 10% risk of abortions<sup>[30]</sup> as shown in figure 2.

The present study shows that Intrauterine growth retardation (IUGR) 6% in teenage and 2% in elderly

primigravida. This was comparable to study done in 2013 by Rudra *et al* which reported incidence of IUGR as 6.7%.<sup>[32]</sup> Other study done in 2010 by Saxena *et al* reported incidence 5.5% in teenage.<sup>[36]</sup> Increased rates of PIH, lower levels of nutrition and weight gain could explain the higher levels of IUGR as depicted in Figure 3.

This present study shows that ante-partum hemorrhage was observed more in elderly primigravida than teenage i.e. 6% (Placenta previa 4% and abruptio 2%) and 2% respectively. Well comparable observations were made by others like Amarin *et al* and Ziadeh SM *et al*<sup>[32, 33]</sup> they all also found that elderly women had significantly more ante-partum hemorrhage than non-elderly. Abruptio was significantly higher in women over 35 compared to other groups reported by Giri *et al* i.e 5.5% in the elderly.<sup>[34]</sup> as depicted in figure 4.

In our study the incidence of normal vaginal delivery among the teenage pregnancies (63.82%) was more when compared to the elderly primigravida (57.7%). Comparable to the incidence reported by Rudra *et al* in 2013 as 75%.<sup>[31]</sup> When other modes of delivery were concerned it was found that LSCS and assisted instrumental delivery was 31.9% and 4.25% in teenage and 40% and 2.2% in the elderly primi. In a study done 2004 by Naqvi *et al* it was reported that 30.76% of elderly group were delivered by caesarean section as compared to 16.02% in young group.<sup>[35]</sup> In other studies by Jahan MK *et al*, Achanna S *et al*, Goldman *et al*, seoud *et al* nojomi *et al*, verma *et al* reported the rate of caesarean section was also more among the elderly.<sup>[36, 37, 14, 38, 39]</sup> The caesarean section rates among the elderly primi was higher because of increased antepartum intrapartum complications, more number of elective caesarean sections done considering the "premium" nature of pregnancy in the elderly as shown in figure 5.

The incidence of IUD in teenage mothers was 4% and incidence in elderly mothers 2 percent. This was comparable with the findings of other studies done by Ziadeh *et al* and Philip Wayatt reported an increased incidence of IUD in teenage also saxena *et al* reported incidence of 4.3%.<sup>[33, 40, 32]</sup> However Amarin *et al*, Nojomi *et al*, Naheed *et al* did not find any increase in perinatal mortality rate in women > 35 years when compared to younger women.<sup>[41, 42, 43]</sup> as in figure 6.

The fetal outcomes like incidence of LBW babies, neonatal morbidity, stillbirth and NICU admission results were similar in both the groups. In our study, LBW babies in teenage group and elderly group was 43.1% and 40% this was in accordance with various other studies.<sup>[43]</sup> Other Indian studies found the incidence of LBW babies between 33 and 39%.<sup>[44]</sup> Also, in our study low APGAR scores at birth, respiratory complications and septicaemia were necessitating NICU admission 48.9% babies of teenage mothers and the 57.7% of babies of elderly mothers. The admissions were higher in elderly because of precious pregnancy and other

associated risk factors during the antenatal period. High incidence of low birth weight babies and other adverse neonatal outcome indicate poor nutritional status coupled with demand of nutrition for her own growth affecting the fetus in the teenage. Studies of LBW babies are contradictory. For example one author could not find any relationship.<sup>[45]</sup> not independently associated with specific adverse the importance of both counseling patients for specific adverse outcomes associated with maternal age. Maternal age alone may be a factor influencing physician decision making. Some authors reported a higher incidence of low birth weight among babies born to teenage mothers.<sup>[46, 47]</sup> it was found no significant difference in birth weights between the two groups. He observed that factors known to vary with birth weight included socio-demographic and anthropometric characteristics of the mother, antepartum care, time of onset of labor, the length of gestation, and the sex of the infant. Maternal socio-demographic characteristics included race, marital status, and hospital ward status. Gestational age was the most important variable in predicting birth weight.<sup>[48]</sup> stated that the risk of low birth weight among teenage mothers was small and it could be further reduced by good antenatal care.<sup>[49]</sup> as shown in figure 7.

This present study shows that there was no newborn death was recorded in any of the two group of women i.e. teenage and elderly primigravida. Authors reported that perinatal mortality was relatively high in elderly groups and compared to young primigravida.<sup>[35, 50]</sup>

Importance of adequate prenatal care especially in adolescent pregnancy to reduce the adverse outcome is well known. As in our study, older teenagers (16-19 years) are the majority of teenage mothers in India and most of them are married. They often have adequate social and psychological support from the family. If they receive proper antenatal care, outcome of pregnancy improves to a comparable level to the adult age group. A benefit of prenatal care in the pregnancy is a well established fact. The effects of prenatal care specially to the teen mothers is reemphasised in our study as in some other studies.<sup>[51, 52]</sup>

Throughout the world, various measures are being taken to prevent teenage pregnancy. Educating and creating awareness about the perils of teenage pregnancy is the best approach for this problem.

In U.S., a national campaign has been started in February 1996 with the goal to reduce teen pregnancy rate by 1/3 over 10 yrs and in 2006, the goal was again revised to reduce teen pregnancy rate by another 1/3 between the years 2006 – 2015. In U.S. schools, a popular video 'Too young' is being telecasted, where teen parents from a variety of backgrounds share their stories and in their own words offer their candid view about the difficulties they have faced.<sup>[53]</sup>

In Jharkhand, a 16 hour course prepared by UNESCO, named 'Learning for life' '**Jeevan ke liye siksha**' has been made compulsory for class 11 and class 12 students which educates about HIV, STDs, teenage pregnancy and ways to prevent it.<sup>[54]</sup>

All over India, 2 programs have been initiated by FOGSI. '**Growing Up**' program initiated by FOGSI in partnership with Johnson and Johnson educates schoolgirls on menstruation, its myths and hygiene, anatomy and functioning of the reproductive system, value of good nutrition and exercises, problems of drugs alcohol and smoking and about sexual abuse. Another program '**Let's talk**' initiated by FOGSI in association with Organo educates college going women about various forms of contraception.<sup>[55]</sup> '**Teenage girl clinic**', set up in various Government hospitals tackles various problems encountered by teenage girls and distributes iron tablets to teenage girls to improve adolescent health.<sup>[56]</sup>

'**Family Welfare Clinic**' offers excellent services in the form of contraceptive measures including emergency contraception and by providing with MTP services in case they get pregnant. With these measures, we can hope to eradicate teenage pregnancy at least in the future generation, just as we have brought 100% immunization among antenatal women through various Government programs.<sup>[11]</sup>

Health education and counseling of women before pregnancy about adverse pregnancy outcomes associated with maternal age with due stress on the importance of early and adequate prenatal care in case of teenage or elderly pregnancy. Maintainance and upgrading of the quality of maternity care with high coverage is the corner stone to mitigate the potential adverse effects of teenage and older pregnancies.

## SUMMARY

1. This study was done to determine the incidence of teenage primi 15 to 19 yrs of age and elderly primigravida  $\geq 35$  to 41 yrs which is 2.8% and 1% respectively.
2. To determine the maternal and fetal outcome in nulliparous women at 15 to 19 yrs and  $\geq 35$  to 41 yrs of age.
3. Risk associated with different variables in teenage and elderly primigravida were estimated.
4. Detailed history, clinical examination and relevant investigations were done.
5. Incidence of Pregnancy induced hypertension was 8% in teenage primigravidae and in elderly primi it was 6% and incidence of chronic hypertension was 4%.
6. Incidence if gestional diabetes mellitus was more in elderly primigravida 4% and type II Diabetes Mellitus 2%.
7. The rate of vaginal delivery was 63.82% and caesarean section was 31.9% operative vaginal

deliveries 4.25% among the teenage primi and among the elderly primigravida were 57.7%, 40% and 2.2% respectively.

8. No perinatal mortality was observed during the study period October 2013 to September 2015.
9. No maternal mortality was observed during the study period October 2013 to September 2015
10. Factors such as Anemia, PIH, Eclampsia, Preterm labour, IUGR, IUD, Stillbirth, operative vaginal deliveries incidence were more in teenage group.
11. Factors such as Antepartum hemorrhage, chronic hypertension, Gestational diabetes mellitus, type II diabetes mellitus, increased rates of caesarean sections, congenital malformation were higher among elderly group.

## CONCLUSION

When planning healthcare for pregnant women, extremes of maternal age need to be recognized as risk factors for adverse delivery outcomes, and antenatal and intrapartum care needs to be planned accordingly. This study have significantly higher rates of complications in teenage group. This may cause retardation of growth and development, and also deprive them of their childhood and education with resultant deterioration of the overall health of the nation. The time has come to focus on this problem. Education, nutritional support, and family planning, along with creating awareness among the community and also the school girls about the importance of delaying marriage, reproductive health, family life, and population education will definitely help in transforming today's adolescent girls into healthy and responsible women, giving birth to a healthy future generation.

Advancing maternal age appear to be associated with much with hypertensive complications such as gestational hypertension and preeclampsia and with the medical complications concomitant with aging. This study better defines the importance of both counseling and following patients for specific adverse outcomes associated with advancing maternal age. Patients aged 35 years and older are at an increased risk for miscarriage and fetal chromosomal abnormalities, many of which may be diagnosed prenatally where NT Scan at 11 weeks, triple markers are to be done. Age 40 years and older is an independent risk factor for gestational diabetes, placenta previa, placental abruption, cesarean delivery, and perinatal mortality. The role of routine antenatal surveillance in women aged 40 years and older requires further investigation because these women seem to be at increased risk for perinatal mortality. Although the likelihood of adverse outcomes increases along with maternal age, patients and obstetric care providers can be reassured that overall maternal and fetal outcomes are favorable in this patient population if proper antenatal care and follow up done.

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