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# To Study Impact of Advanced Maternal Age on Pregnancy Outcome at Tertiary Care Center

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**Abstract**

*Introduction:* "Successful motherhood is the unique achievement in woman's life" Advanced maternal age is defined as age 35 years or more for the mother at the time of delivery. Across the world, there is a rising trend among women towards delaying pregnancy and child birth. In obstetric practice, maternal age is an important determinant of the outcome of pregnancy. Pregnancy after the age of 35 years can present a challenge because it is associated with the maternal and fetal risk factors. *Aims & Objectives*: To evaluate the Maternal outcome of labour & perinatal outcome with advanced maternal age. To study age and parity distribution. *Material & Methods:* Total 100 Patients of Pregnancy with advanced maternal age who met all the parameters in inclusion and exclusion criteria were taken. This is Hospital based retrospective study in ACPM Medical College over a period of 2 years from June 2014 to May 2016. Data collected from the patient's medical records and hospital database. *Results:* The mean age of the patients was 37.4yrs, in which 58% were multigravida. 42% were primigravida. The rate of LSCS was 41% which was significantly higher. There was increased incidence of hypertensive disorder, gestational diabetes mallitus, pre-eclampsia & malpresentations. *Conclusions:* Advanced maternal age is high risk pregnancy with adverse maternal & perinatal outcomes. It is a vital time to screen for congenital and chromosomal abnormalities. There was significantly increased rate of instrumental delivery and caesarean section. There is a need for individualising antenatal obstetric care based on age group in older to attempt to improve maternal and perinatal outcomes.

**Keywords:** Advanced Maternal Age; Pre-Eclampsia; Multiple Pregnancy; Caesarean Section; Antepartum Haemorrhage.

## Introduction

***"Successful motherhood is the unique achievement in women's life"***

Maternal age affects pregnancy from conception to delivery [1]. A young mother giving birth is a social rather than a medical problem, whereas the reverse is true for older mothers. Advanced maternal age, generally held to signify age after 35 years at the time of delivery, it is a term that implies decreased fertility and increased risk [2].

## History

Postponement of first births in a number of countries has now continued unabated for more than three decades, and has become one of the most prominent characteristics of fertility patterns in developed societies. A variety of authors (in particular Lesthaeghe) have argued that fertility postponement constitutes the 'hallmark' of what has become known as the second demographic transition. Others have proposed that the postponement process itself constitutes a separate 'third transition'. On this latter view, modern developed societies exhibit a kind of

dual fertility pattern, with the majority of births being concentrated either among very young or increasingly older mothers. This is sometimes known as the 'rectangularisation' of fertility patterns.

Globally, there is a rising trend among women towards delaying pregnancy and childbirth. This is due to improved outlook of women and the society regarding educational status, professional goals, easy access to wide range of modern contraceptive methods and availability of assisted reproductive technology [3]. But in a developing country like India, the scenario is different where poor socio-economic status, lack of contraceptive knowledge, religious issues, desire for male child, dowry system, concept of large family predominate.

Advanced maternal age is usually defined as age 35 or more for the mother at the time of delivery. Becoming pregnant after the age of 35 years can present a challenge because of the maternal risk factors associated with it, such as–subfertility, miscarriages, ectopic pregnancy, pre-eclampsia, gestational diabetes mellitus, anaemia, intrauterine growth restriction, antepartum haemorrhage, placental abruption, placenta previa, higher incidence of instrumental deliveries, caesarean section, post-partum haemorrhage and foetal risk factors such as – chromosomal abnormalities (Mainly down's), malpresentations, multiple pregnancy, IUGR, prematurity, increased NICU admissions due increased perinatal morbidity and mortality [1,4,5]. Hence to summarize advance maternal age of a pregnant women is a high risk factor and such patients needs to be handled by a trained person from the very early stage of pregnancy.

*Pre-Conception Issue*

There are multiple factors both physiological and acquired that contribute to this diminished fertility with increasing age. Acquired pathology contributing to infertility, particularly tubal disease, also uterine fibroids and endometrial polyps also accumulate over time and may also play a role. Ovarian occyte reserve declines with age, oocyte quality diminishes over time as well [6]. The risk of aneuploidy rises significantly with advancing maternal age [7,8]. Normal physiology predicts higher rates of aneuploidy with aging, errors accumulated over time seem to increase the risk of non-disjunction, leading to unequal chromosome products at completion of division. In a recent RCT involving preimplantation genetic diagnosis for women of AMA aneuploidy rate was 43.2% of the tested embryos [9]. A woman's chance of progressing from the beginning of ART to pregnancy and live birth (using her own eggs) decreases at every stage of ART as her age increases (25.7% in younger versus 2.9% in older) [10]. Age specific risk for Trisomy 21 and chromosomal anomalies in 20 years is 1/1667 and 1/526 respectively and in above 35 years is 1/378 and 1/192 respectively.

*First Trimester Complications*

It is well established that older women are at increased risk. From the Faster (First and Second Trimester Evaluation of Risk) trial, in which approximately 30,000 women at 10-14 weeks gestational age were enrolled in a prospective multicentre investigation of singleton pregnancies, revealed increasing rates of both threatened abortion and miscarriage with advancing maternal age. The leading cause of death in early pregnancy, ectopic gestation, remains one of the most significant obstetric complication.Older data suggests up to an 8-fold increased risk of ectopic pregnancy in women >35 years compared to younger women [11,12].

*Risk of Tubal Pregnancy*

Increased frequency of tubal problems prevalent in ARTs contribute to higher ectopic pregnancies in older women. The risk of tubal pregnancy is 1.4% at age 21 rising to 6. 9% at 44 years old [11].

*Gestational Diabetes*

Prevalence of diabetes increases with maternal age. Rate of overt diabetes and gestational diabetes increases 3-6 times in AMA [3,13,14].

*Chronic Hypertension*

More frequentin patients older than 35 yrs. Chronic hypertension is present in approximately 5% of pregnant patients. Patients who have chronic hypertension are more likely to develop superimposed pre-eclampisa [15], There is increased need to deliver by caesarean section, placental abruption, congestive heart failure, IUGR, hypertensive encephalopathy etc. than normotensive patients.

*Multiple Pregnancy*

Spontaneous conception of twins are more frequent in older women. This is explained by slightly increased FSH levels favouring releasing of two ova. The other reason for multiple pregnancy in this group is a widespread use of ART [16]. In multiple gestation,

there is additional risk of maternal morbidity and adverse outcomes with increasing maternal age and parity [17]. Multiple pregnancy is known to cause poor obstetric outcome in women. Being a vulnerable age group at the outset, women of advanced maternal age are expected to be at an increased risk of this complications as well [18].

**Pre-Eclampsia & Gestational Hypertension**

It is defined as the development of hypertension with proteinuria after 20 weeks of gestation. AMA (Advanced maternal age) can be considered as one of the many risk factors for pre-eclampsia [19].

*Abnormal Placentation*

Placental abruption and placenta previa. Lahmann and Chism reported placental abruption can occur in approximately 3.2% of pregnancies in AMA compared with 0.4% in younger counter parts.

*Caesarean Section and Dysfunctional Labour*

LSCS is performed more frequently in women of AMA [14,20]. In some cases it is related to confounding problems such as HTN, pre-eclampsia, placental abruption or fetal macrosomia. Cesarean section is associated with increased maternal risk like immediatehaemorrhage, infection, and aspiration pneumonitis. Hysterectomy following a caesarean section occur 10 times more frequently than vaginal delivery. The risk of maternal morbidity is 16 times more. Long term morbidity includes adhesions, bowel obstructions, bladder injuries and increased risk for placenta previa and ectopic gestation in next pregnancy.

The duration of labour tends to be increased by about 25% on an average. Much of this is due to the greater anxiety of the older women with labour for the first time, and some degree of inertia is common. Posterior positions of the occiput are much more usual, while the effects are more troublesome, and in about one third of the cases labour is likely toprolong because of this malposition. Inertia is also likely to be complicate the case where labour has been induced, and the response to induction tends to be more unsatisfactory. As in all cases of induction, one should have a sound indication for embarking upon it. It is said that labour may be adversely influenced by the impaired joint mobility that comes with increasing years, but the significance of this is small compared with the functional activity of the uterus and the elasticity of the soft tissues of the birth canal [21].

*Aims & Objectives*

1. To evaluate the outcome of labour with advanced maternal age (35 to 45yrs).
2. To study age and parity distribution.
3. To study complications of labour in relation to the advanced maternal age.

**Marerial & Methods**

- *Source of Data:* all women of advanced maternal age (35 to 45yrs) in tertiary care centre.
- *Study Design:* Hospital based Retrospective randomised study.
- *Study Setting:* ACPM Medical College, Dhule.
- *Study Period:* Over a period of 2 years from June 2014 to May 2016.
- *Sample Size:* 100 Patients admitted to Labour room above 35 years of age.

*Method of Data Collection*

Data collected from the patient's medical records and hospital database included: age, parity, BMI, pre-existing medical disorder, obstetric complications, and malpresentation, mode of delivery, average size of the baby, NICU admission, and any congenital or chromosomal abnormalities.

*Inclusion Criteria*

1. Pregnant women of age 35 to 45yrs were taken into the study population.
2. Pregnant women willing to participate in study.
3. All primigravida & multigravida above age 35 years to 45 years.

*Exclusion Criteria*

1. Women with multiple gestations.
2. Pregnant women <35 years and>45 years.
3. Women refuse for consent.
4. Pregnant women with congenital malformation of uterus.

**Results**

*Age Group*

In this study 88% belonged to 35-40yrs, 12%

belonged to 41-45yrs age group. The mean age group was 37.4yrs. Similarly in study conducted by Ramachandran N et al. mean age were 37.1years [3], 36.4years in study of Najah Abdul Rehman et al [22] and 35.8years in study conducted by sahu et al [23].

*Parity Status*

In study group 42% were primigravida and 58% were multigravida. In study conducted by rajmoham L et al, 65% were multigravida and 35% were primigravida [2].

*Treatment for Infertility*

15% cases of study group had assisted conception, comparable to study conducted by Ramachandran N et al. which was 14.3%[3] and study conducted by Padwe Anuya A et al which was 12.6% [1].

*Mode of delivery*

In study group 51% of patients underwent vaginal delivery, 8% underwent Instrumental delivery. 41% of study group patients underwent LSCS which was significantly higher. In study conducted by Rajmohan L et al. 47% delivered vaginally, 48% underwent LSCS and 5% had instrumental delivery [2], Which was comparable to our study. In study conducted by abdul rehman, 66% had vaginal delivery, 30% underwent LSCS and 4% had instrumental delivery [22].

*Indication for LSCS*

Commonest indication for LSCS in this study was Failure of Induction 30% followed by Previous LSCS as 25%. Results of study conducted by priyadatta patel et al also shows failure of induction was commonest indication for LSCS [24]. In study conducted by Abdul rehman, commonest indication was previous LSCS 16% followed by fetal distress 6% [22].

*Labour Profile*

In study group 22% were preterm delivery and 64% were term delivery, 14% post-term delivery. In study conducted by priyadutta shows 26% preterm delivery, 61% term delivery and 13% post term delivery [24].

*Maternal Complications*

- *Hypertensive Disorders:* 8% patients had Hypertensive disorder of pregnancy amongst them 4 had Gestational hypertension, 3 patients had pre-eclampsia and 1 patient had eclampsia. Incidence of hypertensive disorders in study conducted by pawed anuya was 17.54%[1] & 10.1% in study conducted by sahu T meenakshi [23].
- *Gestational Diabetes:* Incidence of GDM was 7%, 2 cases of overt diabetes in study group. In study conducted by rajmohan L et al incidence of gestational diabetes was 10.5% [2].
- *Malpresentations:* Malpresentation rate was 5% amongst them 4 had breech presentation and 1 was transverse lie. Incidence of malpresentation in study conducted by abdul rehman was 3% [22].
- *Preterm Delivery:* 5% patients of study group had preterm delivery. In study conducted by pawed anuya, incidence of preterm delivery was 10.3% [1].

**Table 1:** Parity status

| Parity Status | No of Cases | Percentage (%) |
|---|---|---|
| Primigravida | **42** | **42** |
| Multigravida | **58** | **58** |

**Table 2:** Mode of delivery

| Mode of Delivery | No. of Cases | Percentage (%) |
|---|---|---|
| Vaginal Delivery | 51 | 51 |
| Instrumental Delivery | 8 | 8 |
| LSCS | 41 | 41 |

**Table 3:** Indications for LSCS

| Indications for LSCS | No of Cases | Percentage (%) |
|---|---|---|
| Failure of induction | 12 | 29.26 |
| Previous LSCS | 10 | 24.39 |
| Foetal Distress | 8 | 19.51 |
| Malpresentation | 5 | 12.19 |
| Associated Medical Condition | 6 | 14.63 |
| TOTAL | 41 | 100% |

**Table 4:** Labour profile

| Labour Profile | No of Cases | Percentage (%) |
|---|---|---|
| Pre-term Delivery | 22 | 22 |
| Term Delivery | 64 | 64 |
| Post-term Delivery | 14 | 14 |
| **Labour Profile** | **No of Cases** | **Percentage (%)** |
| Pre-term Delivery | 22 | 22 |
| Term Delivery | 64 | 64 |
| Post-term Delivery | 14 | 14 |
| **Labour Profile** | **No of Cases** | **Percentage (%)** |
| Pre-term Delivery | 22 | 22 |
| Term Delivery | 64 | 64 |
| Post-term Delivery | 14 | 14 |

**Table 5:** Maternal complications

| Maternal Complications | No of Cases | Percentage (%) |
|---|---|---|
| Hypertensive Disorders | 8 | 8 |
| Gestational Diabetes Mellitus | 7 | 7 |
| Preterm Labour | 5 | 5 |
| Malpresentation | 5 | 5 |
| Antepartum Haemorrhage | 3 | 3 |
| IUGR | 2 | 2 |
| Post-Partum Haemorrhage | 2 | 2 |
| Multiple Pregnancy | 1 | 1 |

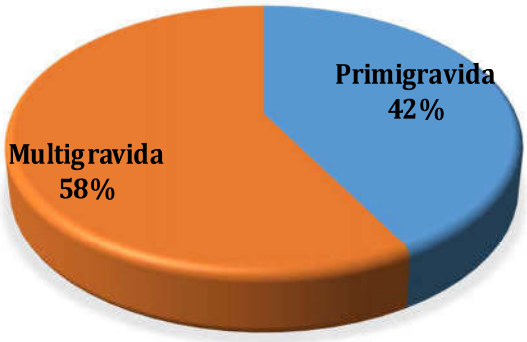


**Fig. 1:**

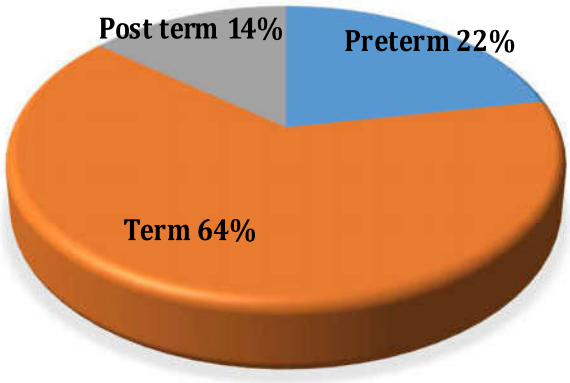


**Fig. 3:**

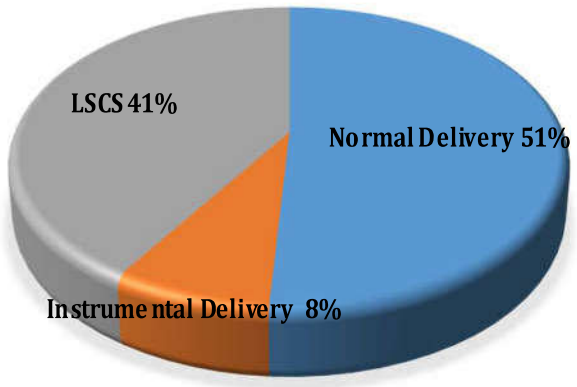


**Fig. 2:**

- 3% had *Antepartum haemorrhage*, 2% had *IUGR*, 2% had *postpartum haemorrhage*, and 1 patient was with *twin gestation*.

## Discussion

Having children later was not exceptional in the past, when families were larger and women often continued bearing children until the end of their reproductive age. What is so radical about this recent transformation is that it is the age at which women

give birth to their first child which is becoming comparatively high, leaving an ever more constricted window of biological opportunity for second and subsequent children, should they be desired. Unsurprisingly, high first birth age and high rates of birth postponement are associated with the arrival of low, and lowest low fertility. Effect of Advanced maternal age is a continuum where pregnancy is concerned and there is no definite cut-off age after which we can predict that there is no complication [16].

This could be due to impact on oocyte quality, defective chromosome segregation, aneuploidy and uterine factors [11]. Oocyte quality decrease in relation to increasing maternal age. Low quality oocytes cause increased DNA damage and chromosomal aneuploidy, secondary to age related dysfunction. These mitochondrial changes may arise from excessive reactive oxygen species. Higher level of oxidative stress have been demonstrated in women of advanced reproductive age group undergoing IVF. Reactive oxygen species perturb the intracellular calcium homeostasis in the oocyte and cause aging of the oocyte [25].

Preconception counselling is highly desirable, if not this should be seen early in pregnancy for assessment of their baseline condition and work out of pregnancy plan. Women with advanced maternal age required details supervision both during pregnancy and labour [26].

Relative indications for Caesarean Section have to be extended in pregnancy in advanced maternal age [21]. These patients are anxious and very unsure of their ability to deliver themselves safely. Sympathetic attitude and confident handling is required for an essential part of management. Epidural analgesia can be beneficial in reducing patient's anxiety and providing good pain relief in labour. A wealth of information is available documenting the age related increased risk of operative or instrumental delivery. The possible hypothesis are decreased pelvic compliance, reduced maternal efforts, decrease in oestrogen receptors and anxiety by mother and obstetrician [27-30]. However even after watchful labour, the incidence of caesarean is more with advanced maternal age group

Signs of maternal distress in labour, as might therefore be expected, appear more readily in the older women. Close monitoring of the foetal heart, weather by intermittent auscultation or by cardiotocography is essential. The progress in the 2nd Stage should also be watched closely since delivery may have to be assisted in up to half the cases. The perineum and lower vagina do not stretch so well, so that episiotomy is often indicated and should be unhesitatingly employed. Instrumental delivery is required about two or three times as often as in younger women and the caesarean section rate is increased 4 fold [21]. The inertia of the first and second stage of labour is likely to extend into the third stage. Manual removal of placenta is required more frequently, and the coexistence of fibroid makes this operation more likely. The incidence of postpartum haemorrhage is consequently increased as well.

Lastly to conclude, increased maternal age is definitely a high risk group with lots of maternal and perinatal complications; but these problems can be overcome and one can expect a good pregnancy outcome.

*Screening*

All such patients should get triple test at 16 weeks gestation and a targeted ultrasound scan in late first trimester and at 18 weeks gestation to look for congenital malformation in foetus.

Any advantages of advanced maternal age?

Although advanced maternal age is associated with many risks, conceiving later has certain benefits also. Childbearing women over 35 are likely to be better educated and of higher socioeconomic status.

These women are more likely:

- To follow a Healthy lifestyle
- To attend for regular antenatal care
- To have positive perception of their pregnancy

These woman will understand the importance of advanced prenatal screening, anomaly scan. This aspect of advanced maternal age is important in developing country like India [31].

*Suggestions*

- Young women should be encouraged to balance the biological advantages of having a child at younger age against the social and economic advantages of obtaining an education and establishing a career.
- They should be educated about the risks of delayed child bearing, age related risk of foetal aneuploidies, the increased risk of both early and late complications of pregnancy.
- If conception has not occurred after 6 months of actively attempting pregnancy, the couple should be referred to a clinician who can initiate an infertility evaluation and help formulate a plan to optimize the establishment of pregnancy.

- Older Women should be offered prenatal screening and prenatal diagnosis, targeted anomaly scan and liberal use of antepartum testing to ensure safe motherhood and a healthy foetus.
- In view of the increased morbidity and mortality associated with pregnancy in advanced maternal age, they should preferably be taken care in tertiary referral centres.

## Conclusion

Pregnancy after 35 yrs is becoming a reality of life in our society and one should have realistic approach to this problem. It is most significant hurdle for older women in their age related risk of infertility, changes in uterine or hormonal function and oocyte quality. Advanced maternal age is high risk pregnancy and it predisposes women to adverse pregnancy outcomes. It is a vital time to screen for congenital and chromosomal abnormalities.The result imply that there is a need for individualising antenatal obstetric care based on age group in older to attempt to improve maternal and perinatal outcomes.

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