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## Advanced maternal age (AMA) and the pregnancy outcomes: A retrospective survey

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### Abstract

Reproductive age range from 15 years to 45 years or 49 years. Peak reproductive years are between later aspect of teen age and late 20's. There is a changing demographic phenomenon over last few decades with many women opting to delay their pregnancy. Delayed pregnancy is associated with adverse pregnancy outcomes but the effects of increasing age occur as a continuum rather than as a threshold effect. Indian literature in this regard is sparse. Objective of this paper was to identify the adverse pregnancy outcomes in the AMA women. Retrospective analysis of two years (2014-2015) data from a tertiary care hospital, Panchkula, Haryana was undertaken. A total of four hundred and sixteen (212 in the year 2014, 204 in the year 2015) women of the age group 30 years and above registered for delivery were taken for analysis from the hospital labour records. Women in their 30 years of age consisted of 33.4% in 2014; 25.9% in 2015; total 29.8%. Maximum percentage of the women belonged to 30-35 years 92.4% in 2014; 92.1% in 2015; total 92.2%. Among all the other adverse maternal outcomes pregnancy induced hypertension (PIH) (9.9% 2014; 7.8% in 2015; total 17.1%) and Gestational Diabetes Mellitus (GDM) (7.1% in 2014; 7.8% in 2015 total 14.3%) were on the higher side. Full term normal delivery was 46% in 2014; 49% in 2015; total 47.5%. Adverse fetal outcomes identified were IUGR, preterm babies, congenital anomalies and still birth. Congenital anomalies included cleft palate/lip and hypospadias.

**Keywords:** Advanced age pregnancy, pregnancy outcome, adverse maternal outcomes, adverse fetal outcomes

### 1. Introduction

Reproductive period covers the age from 15 years to 45 years or 49 years. As per American College of Obstetricians & Gynaecologists (ACOG) peak reproductive years are between later aspect of teen age and late 20's<sup>[1]</sup>. Age of the mother in pregnancy is believed to have some importance from olden times. In this teenage pregnancy was given more importance from the beginning but last two decades has seen a raising trend in advanced age pregnancy. Women delay pregnancy due to various reasons such as women willing to pursue her higher education, stable employment, financial security, inability to find a suitable partner, want of a male child, not having a two living issue etc. When the women reach age 30 fertility starts to decrease and this rate is more rapid in mid 30s and by the age 45 years fertility decline to that extent it is difficult to get pregnant. The occurrence of pregnancy in young women of 20 - 30 years it is 1 in 4 women but by the age 40 it is 1 in 10 women per single menstrual cycle. As women are aging they are prone for medical as well as reproductive complications such as HTN, preeclampsia, GDM, uterine fibroids etc.<sup>[1]</sup>.

### 2. Purpose of this study

Now it is widely known that effects of increasing age occur as a continuum rather than as a threshold effect<sup>[2]</sup>. Increased maternal age and associated risks were studied more in western countries. Indian literature in this regard is sparse. There are better services available and provided to advanced maternal age pregnant women in the developed countries. Even then, adverse maternal and neonatal outcomes were observed in these women. This paper is an initiative to identify the pregnancy outcomes in the advanced maternal age women.

### 3. Literature review

Worldwide there is a rising trend of delayed pregnancy. An extensive examination of maternal hygiene manuals i.e., self-help guidebooks on motherhood and pregnancy published between 1880 and 1920 from Canada, the United States and the United Kingdom was done.

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This analysis indicated that older age pregnancy was presented as potentially dangerous affair which requires constant surveillance by the women and concerned others to have favorable outcomes. The theme emerged from this analysis was that the older pregnant women should be morally responsible to take care of herself. These manuals also indicated that if women fail to seek expert advice and responsible practices it will lead to adverse outcomes in the pregnant women as well as in the newborn's health and moral character later in life<sup>[3]</sup>.

In a WHO multi-country survey 2014 on increasing maternal age by Loapaiboon M *et al.* 2014, AMA pregnancy was categorized into three age group, 35-39 yrs, 40-44 yrs and  $\geq 45$  yrs. It was also identified in the same survey that Japan having the maximum women bearing children in their advanced age Bangladesh being the next, Nepal and India ranked the last two among 29 countries<sup>[4]</sup>.

Age related health conditions directly or indirectly create threat to the pregnancy namely medical problems, gynecological problems, fertility related problems, developmental problems and others. Women delay pregnancy due to varied reasons such as changes in the gender roles, women empowerment policies, desire to achieve socioeconomic goals like education, employment financial security, liberal use of contraceptives, lack of contraceptive use, wider availability of ART, late marriages due to not finding a suitable match or partner, religious reasons, want of a male child, want of larger family etc.<sup>[5-7]</sup>. Older women have less number of eggs and are more likely to have abnormal chromosomes. Though the overall risk of having a baby with birth defect is small, in the very advanced age the risk of having a baby with missing, damaged or extra chromosomes increases. Down syndrome is commonest among all. As women are aging they are prone for medical and reproductive complications such as HTN, preeclampsia, GDM, uterine fibroids<sup>[1]</sup>.

Along with these the clinicians treating infertility are challenged with a decline in fertility and an increase in pregnancy wastage which is a result of advancing age. Young oocytes donated to older women indicates the decline in fertility with age attributed by aging oocytes. In the US there is raising trend in advanced maternal age pregnancy but there is decreased reproductive potential that is associated with the age and the quality of the oocyte. Though the reproductive potential is overcome through young oocyte donation but the abortion rate were found to be 44.5% in the women aged 35 years and older when compared with 14% of 20-24 years women. *In vitro* fertilization pregnancy in the advanced maternal age has resulted in reduced pregnancy rates whereas progesterone assisted young oocyte donation in older women achieved pregnancy rates that was similar in younger age women<sup>[8]</sup>.

Sauer states in his review that women delay their pregnancy due to the media portrayal of a youthful but older woman. Whereas this does not bring out the problems inherent in advanced age pregnancy. This review warrants the need for having a comprehensive view of the literature based realities from the health care professionals dealing with reproductive medicine about the high risk nature and the compromised outcomes of AMA pregnancy. It recommends that the clinicians should actively educate both the clients and the public about the real danger of childlessness if women choose to delay pregnancy<sup>[9]</sup>.

A multi country cross sectional survey was conducted by

World Health Organization to determine the prevalence of maternal near miss cases from worldwide health facilities. This study was conducted in a random sample of 359 health facilities in 29 countries from Asia, Africa, Latin America and the middle east. In this survey four categories of age groups are chosen i.e., 20-34 years, 35-39 years, 40-44 years and 45 years and above. AMA was taken as at or above 35 years. Pregnancy outcomes were classified as maternal and perinatal outcomes. Maternal outcomes was named as severe maternal outcomes (SMO) which comprised of Maternal Near Miss (MNM), Maternal Death (MD) and severe maternal outcomes. Perinatal outcomes included preterm birth (less than 37 weeks), still birth which is more than 22 weeks and less than or equal to 500gms, early neonatal mortality (death of the baby in the 1st 7 days of life), perinatal mortality, low birth weight (baby's weight less than 2.5 kgs) and NICU admissions.

Severe maternal outcomes ratio was 5/1000 live births among 20-34 years women and 20/1000 live births among women age at or above 45 years similarly adverse perinatal outcomes have also shown increasing trend among the AMA pregnant women. This survey concluded that AMA accounts for a significant proportion of all deliveries and national and international focus is needed for AMA pregnancies also recommended for more research to find appropriate and timely interventions to reduce the impact of AMA on pregnancy outcome<sup>[4]</sup>.

A large population based cohort study among 2, 15,344 singleton births in 2004-2008 from North Western Perinatal Survey based at University of Manchester, UK. Comparison was made on the pregnancy outcomes of women in the age group 30-34 years (n=62,371; 27.63%), 35- 39 years (n=33,966; 15.05%) and more than 40 years (n=7,066; 3.13%) with women aged 20-29 years (n=1, 22,307; 54.19%). Study identified that women at and above the age of 40 years had increased risk of the following: still birth (RR-1.83); preterm (1.25); Very preterm birth (1.29); Macrosomia (1.31); extremely large for gestational age (1.40); Caesarean section (1.83). This study concluded that AMA is associated with a range of adverse pregnancy outcomes<sup>[10]</sup>.

A large, contemporary prospective study among women in the age group of less than 35 years, 35 - 40 years and more than 40 years. This study states that as the women are getting older they become prone to various perinatal complications much beyond the medical complications. This study revealed that women aged 35years and more are at an increased risk for miscarriage and fatal chromosomal anomalies and many of these can be diagnosed prenatally. Another findings was age 40years and older is an independent risk for GDM, placenta previa, placental abruption, cesarean delivery and perinatal mortality.

This study recommended and emphasized the importance of both counseling and following the AMA women for analyzing specific adverse outcomes. As there is increasing trend of delayed child bearing this knowledge will help the obstetric care providers to benefit from up-to-date outcome data to enhance their pre conceptional and antenatal counseling<sup>[11]</sup>.

A hospital based survey had two categories of women selected one being more than 35 years (73 subjects) and the other one less than 35 years as reference group (471 subjects). The incidence of pre-eclampsia and eclampsia were not significantly different whereas gestational non-

proteinuria HTN and essential HTN were statistically higher in AMA group along with increased proportion of placenta previa. As per the mode of delivery cesarean section and instrumental deliveries proportion did not significantly differ between the two groups [12].

A retrospective population-based cohort study done obtaining data from ART registries in order to compare the effect of maternal age on ART and spontaneous conception pregnancies regarding maternal and neonatal complications. A total of 39,919 ART conception and 2, 60,166 spontaneous conception singleton deliveries were taken for comparison. The following risks were significantly higher in ART than in spontaneous conception- placenta previa (Adjusted odds ratio 4.11-6.05), cesarean delivery (AOR 1.18-1.50), preterm birth (AOR 1.23-2.19), and LBW (AOR 1.44-2.35). Adverse neonatal outcomes have shown greater increase in Spontaneous conception than in ART conception [13].

A retrospective cohort study done on 472 women aged at and above 45 years with an aim to determine the differences in adverse pregnancy outcomes in very advanced maternal

age (vAMA) women who conceived with ART compared with spontaneous conceptions. vAMA women conceived by ART were significantly older and more likely white. These vAMA women were at significantly increased risk for cesarean delivery and more likely to undergo elective Cesarean delivery before even going into labour. This was also associated with the risk of retained placenta [14].

**4. Methods**

Retrospective analysis of two years (2014-2015) data from a tertiary care hospital, Panchkula, Haryana was undertaken. A total of four hundred and sixteen (212 in the year 2014, 204 in the year 2015) women of the age group 30 years and above registered for delivery were taken for analysis. Presence of adverse maternal and neonatal outcomes of these women was taken from the hospital labour records.

**5. Results**

A total of two hundred and twelve (212) women in the age group 30 years and above registered and delivered in the year 2014 and 204 women in the year 2015.

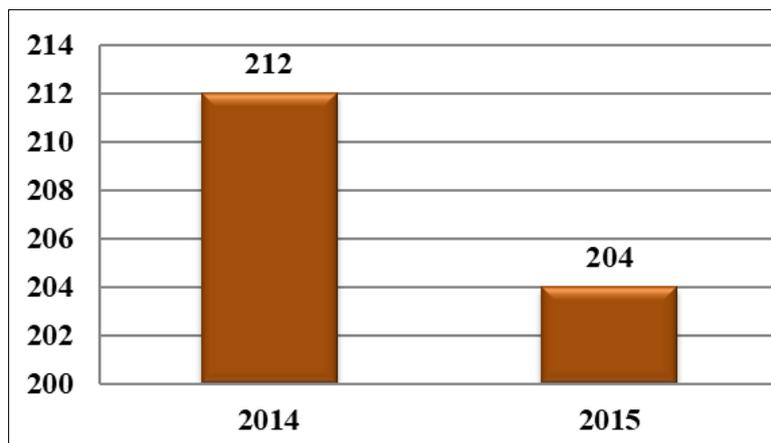


Fig 1: Number of Advanced Maternal Age cases

**5.1 Inference:** In the year 2014 a total of 212 advanced maternal age women registered and delivered where as in the year 2015 it was only 204.

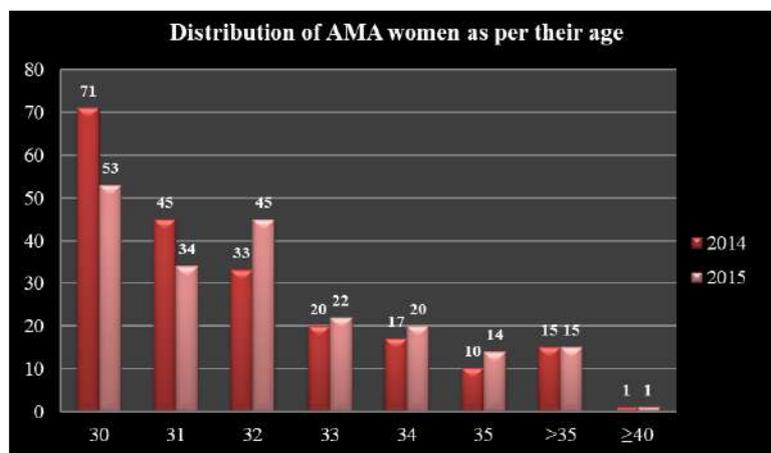


Fig 2: Age wise distribution of Advanced Maternal Age women

**5.2 Inference**

Maximum women were in the age group of 30 years. A Total of 196 (92.4%) women out of 212 of the year 2014 were from the age group between 30-35 years. A total of 188 (92.1%) women out of 204 of the year 2015 were from

the age group between 30 -35 years.

**6. Adverse maternal and fetal outcomes**

This table represents the adverse maternal and previous pregnancy factors and other maternal problems.

**Table 1:** Adverse maternal outcomes among AMA women in the year 2014 and 2015

Adverse antepartum outcomes				
Criteria	2014		2015	
	F	%	F	%
PIH – GHTN, Pre-eclampsia	21	9.9	16	7.8
GDM	15	7.1	16	7.8
PROM >37 weeks	4	1.9	5	2.5
PPROM <37 weeks	3	1.4	5	2.5
Oligohydramnios	3	1.4	1	0.5
Polyhydramnios	0	0	1	0.5
Postdatism	2	0.9	7	3.4
multiple gestation	4	1.9	5	2.5
Bleeding PV	0	0	2	1
Malpresentation	8	3.8	10	4.9
Previous pregnancy factors & Others				
Post LSCS	50	24	56	27
BOH	8	3.8	8	3.9
Other maternal problems	21	9.9	26	13

**6.1 Inference**

Among all the other adverse antepartum outcomes PIH and GDM were on the higher side in both the years. AMA women also had the previous pregnancy factors such as Post LSCS pregnancy which was 24% in the year 2014 and 27% in the year 2015. Other maternal factors included hypothyroidism, PCOD, uterine fibroids etc.

**Table 2:** Distribution based on Mode of delivery

Mode of delivery	2014		2015	
	F	%	F	%
FTND	97	46	99	49
Vacuum delivery	6	2.8	3	1.5
Preterm vaginal delivery	5	2.4	4	2
Vaginal Birth After Caesarean Section	0	0	2	1
Elective LSCS	76	36	50	25
Emergency LSCS	28	13	46	23

**6.2 Inference:** Though full term normal delivery was more in both the years ie. 46% and 49% respectively, Elective caesarean section was also present more ie. 36% and 25% respectively.

**Table 3:** Distribution based on adverse fetal outcomes

Adverse fetal outcomes				
	2014		2015	
	F	%	F	%
IUGR	6	2.8	3	1.5
Preterm babies	8	3.8	6	2.9
Congenital anomalies	2	0.9	3	1.5
Still birth	2	0.9	3	1.5

**6.3 Inference**

Adverse fetal outcomes were IUGR, preterm babies, congenital anomalies and still birth. Out of all these preterm babies were 3.8% in 2014 and 6% in 2015. Presence of Congenital anomalies and the still births were equal in both the years among the AMA women. Congenital anomalies included cleft palate/lip and hypospadias.

**7. Conclusion**

Advanced maternal age pregnancy is in significant proportion worldwide and India is not an exception. Appropriate measures to be taken by the health care professionals in sensitizing the reproductive age group

women to make informed decisions in planning their childbirth. Adequate prenatal services and counseling sessions specific to AMA pregnancy should be provided to these women in order to have safer pregnancy and childbirth.

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