

# Advanced Maternal Age in Tertiary Level Hospital

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## ABSTRACT

**Introduction:** Comparative study to find maternal and perinatal complication in age  $\geq 35$  years and below.

**Method.** Prospective study was done in the Department of General Practitioner, in Patan Academy of Health Science, Lalitpur during two year period (Jan 2020-Dec 2021) to see impact of advanced maternal age (AMA) in the maternal perinatal outcome by comparing the obstetric performances by women 35 years and above (study group) with those below age 35 years (control group).

**Result:** Perinatal complication were slightly higher in women of AMA, in study group, age  $\geq 35$  years in comparison to equal number of women (n=212) in control group, age 35 years without bearing any statistical significance stillbirth, preterm birth, low APGAR Score  $< 7$  very low birth weight.

**Conclusion:** Maternal and perinatal outcome in women of advanced maternal age (AMA) found comparable to women age  $< 35$  years but with a slight increase in preterm birth and minimal neonates seeking perinatal intensive care PICU confers an early booking, counselling, close supervision during antenatal and intrapartum period is called for all women and especially in women of AMA for promising result.

**Keywords:** APGAR score, hypertension, low birth weight, maternal age, neonatal death

## INTRODUCTION

Evidences have shown that at the maternal age between 21-29 years, condition are favourable both for mother and her developing fetus, pregnancy normally taking course with lower rate of abortions, prematurity and fetal growth restriction ending in birth of healthy newborn without birth defects devoid of perinatal mortality, mother happily being able to breast feed new born.

Conversely pregnancy whereas on advanced maternal age (AMA), earlier defined as age 35 years or more but presently reconsidered to be age 40 years or more, very advanced maternal age (VAMA) and extremely AMA (EAMA) for age of 45-49 has been shown to be associated with adverse pregnancy outcomes when compared to pregnant women of age less than 35 years.<sup>1</sup>

This begins right from conception. As maternal age increases the genetic material contained in the ova ages and oocyte quality gets poorer resulting in errors occur during cell division and migration during meiosis, which results in aneuploidy (an abnormal number of chromosomes) leading

to increased risk of trisomies and Down's syndrome.<sup>2,3</sup>

Thereafter there is potential risk of complication during pregnancy and or delivery with adverse outcome. Hypertensive disorders of pregnancy (HDP), diabetes, gestational diabetes mellitus (GDM), mal-presentations, mal-position, antepartum hemorrhage (APH), induction of labor, prolonged labor, instrumental deliveries, increased caesarean section rate and postpartum hemorrhage (PPH). Guarded perinatal outcomes, congenital anomalies, preterm birth, intrauterine growth restriction, including low birth weight requiring Pediatric Intensive Care Unit none the less with the unfortunate occurrence of stillbirths, perinatal

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mortality and early neonatal mortality.<sup>4</sup> In Austria perinatal deaths in women aged  $\geq 40$  yrs is twice as high compared to the risk of women aged 25-34 yrs. with increased incidence of preterm delivery.<sup>5</sup>

Therefore the concern lies currently both in the developed and the developing countries with the increase incidence of women in AMA with quoted highest incidence in Norway as 33.4% with an average of 12.3% from the studies done in 29 countries which for Nepal is 2.8%.<sup>6</sup>

So, through this study we aim to evaluate the maternal and perinatal outcomes in Nepalese women of advanced maternal age. This information is believed to facilitate counselling women of advanced maternal age intending to become pregnant and allow them to improve on potential amendable risk factors, monitoring, and effective management of complications.

## METHODS

In order to study and analyze whether advanced maternal age in Nepalese women was associated with adverse perinatal outcome, the perinatal outcome of women of advanced maternal age taken 35 years and more was studied and respectively compared with women delivering below 35 years.

Preliminaries included taking informed written consent from the pregnant women willing to be enrolled in the study, who were explained thoroughly about the nature of the study procedure.

Women of age 20-34 yrs age group who had presently delivered and fulfilled the inclusion criteria were taken as the comparative group. For this, Labor Room was checked daily.

Period of gestation was calculated from the last menstrual period as reliable if the previous 3 cycles before the last menstrual period was regular and spontaneous. However, if the last menstrual period was unreliable, the gestational age was calculated by the first trimester ultrasound. Second trimester ultrasound was taken if first trimester ultrasound was not available. If neither record was available then period of gestation was calculated from the time of positive urine pregnancy test, her obstetrical records indicating first trimester clinical uterine size and the time of quickening. If above parameters failed to confirm the period of gestation, then the sample was omitted from the study.

Details on mode of delivery and indications for either operative vaginal delivery or cesarean delivery were noted. All these findings were recorded on the predesigned and pretested pro forma.

### Data Analysis

A structured questionnaire was used on all the study population and all of them were filled up. If any woman was in doubt about her age, she was asked to recall important events of their life such as duration of their marriage, age at marriage, age of 1<sup>st</sup>/last child. If the woman was still not sure of her age then was excluded from the study.

Details on mode of delivery and indications for either operative vaginal delivery or cesarean delivery were noted. All these findings were recorded on the predesigned and pretested pro forma.

Data collection was done using a structured questionnaire

and information were filled up. Information obtained were entered into the master chart. Computer software SPSS 20 was used for processing and analysis of the data.

Total number of women in each group was calculated.

Chi-square ( $\chi^2$ ) test was used. Odds ratio to compare obstetrical outcome of women of advanced maternal age with women of 20-34 yrs was calculated. Confidence interval of 95% was taken and P value  $< 0.05$  was taken as statistically significant.

Analysis of data was performed upon completion of the study. The data were entered into the computer Epi-info software and Microsoft excel. Results are presented in tables, graphs and diagrams. Odds ratio was calculated to investigate statistical significance. Result obtained from the study were discussed with reference to current world literature. Conclusions were drawn based on these results and recommendations regarding current practices are being made.

### Ethical consideration

Approval of the study was obtained from the Institutional Review Board (IRB) of PAHS. Informed written consent were obtained from all participants. For written consent generic PAHS format in English and Nepali were used. Participants were given the option to withdraw from the study at any time without giving any reason during the study period. Confidentiality of the research participants were guaranteed.

A statement indicating that the participant has understood all the information in the consent form and is willing to participate voluntarily was obtained. Participant were explained about the research detail, its significance, the benefit and harm, in the language he or she understands before obtaining the consent, their queries were answered. When required, a witness was present during the interview.

### Definitions

- 1) Perinatal death: defined as death of a fetus or newborn with a birth weight of at least 500 gms occurring antenatal or within the first 7 days after delivery
- 2) Stillbirth: death of a fetus weighing 500 grams or more; if birth weight is unknown, by gestational age of 22 weeks or more; or, if both these criteria are unknown, by crown heel length of 25 cm or more according to World Health Organization (WHO) / the International Statistical Classification of Diseases (ICD)
- 3) Preterm delivery: defined as delivery before 37 completed weeks of gestation
- 4) A. Low Birth weight (LBW) - baby weighs less than 2500 grams
  - B. Very low birth weight (VLBW) - baby weighs less than 1500 grams
  - C. Extremely low birth weight (ELBW)- baby weight less than 1000gms

## RESULTS

In this study, 112 women of advanced maternal age (AMA) were taken for study and their obstetrical outcome and perinatal outcome was compared with a similar number

(112) pregnant women of age less than 35 years. The sample of case and comparative group was taken in the ratio of 1:1. For calculation, odds ratio and 95% confidence interval was taken.

Out of 1813 deliveries during the study period, 112 were above the age of 35 years at the time of admission. The overall prevalence of advanced maternal age at pregnancy was 104 (5.73%) of which 91 (87.50%) of pregnant mothers were in advance maternal age group (35-39 years) and 13 (12.50%) were in very advance age group ( $\geq 40$  years).

Co-morbidities were observed in the both groups but it was more in women less than 35 years, among them two women were already diabetic. There were less numbers of mothers in advance maternal age group (AMA) who were hypertensive and diabetic than the counterpart mothers (Table 1) although PPH occurred equal number 2 (1.78%).

Regarding perinatal outcome, congenital malformation / birth defects was nil. There were three stillbirths two in mother of AMA while equal numbers perinatal deaths, one each were seen, both the groups (Table 2).

Overall low birth weight was observed in 40/224 (17.8%) without marked differences in relation to age, although the number of very low birth weight was twice as high ( $n=5:2$ ) in mother of AMA as compared to mothers below 35 years (Table 3). Findings of low APGAR Score  $<7$  was seen in AMA (Table 4). Preterm delivery and Pediatric Intensive Care Unit care admission doubled in mother of AMA [22 (19.6%) vs 10 (8.9%)] Table 5.

Table 1. Co-morbidities and maternal age

	Hypertension	DM	PPH	PL
$\geq 35$ years ( $n=112$ )	5 (4.6 %)	1 (0.8%)	2 (1.8%)	2 (1.78%)
$< 35$ years ( $n=112$ )	10 (8.9 %)	8 (7.1%)	2 (1.8%)	3 (2.67%)

Table 2. Perinatal Outcome with respect to maternal age

Maternal Age	Perinatal outcome			P value
	Live birth	Stillbirth	Perinatal death	
$\geq 35$ years ( $n=112$ )	109 (97.3%)	2 (1.8%)	1 (0.9%)	.845
$< 35$ years ( $n=112$ )	110 (98.2%)	1 (0.9%)	1 (0.9%)	
N=224	219 (97.8%)	3 (2.6%)	2 (1.8%)	

Table 3. Birth Weight and maternal age

Maternal age	Birth weight					p value
	A	B	C	D	E	
$\geq 35$ years ( $n=112$ )	89 (79.5%)	16 (14.3%)	5 (4.6%)	1 (0.8%)	1 (0.8%)	.653
$< 35$ years ( $n=112$ )	94 (83.9%)	15 (13.4%)	2 (1.8%)	1 (0.8%)	0	

n=224	31 (13.8%)	7 (3 %)	2 (0.8%)		
	40 ( 17.8 %)				

Note: A= normal weight, B= low birth weight, C= very low birth weight, D= extreme low birth weight, E= Over weight

Table 4. APGAR Score

Maternal Age	APGAR		P value	Odds ratio	95% confidence interval
	$\geq 7$	$< 7$			
$\geq 35$ years ( $n=112$ )	101 (90.2%)	11 (9.8%)	.518	.706	.2732- 1.828
$< 35$ years ( $n=112$ )	104 (92.9%)	8 (7.1%)			

Table 5. Preterm Delivery/ Pediatric Intensive Care Unit -PICU admission

Maternal Age	Preterm Delivery <37 weeks)		P value	Odds ratio	95% Confidence interval
	Yes	No			
$\geq 35$ years ( $n=112$ )	22 (19.6%)	90 (80.4%)	.022	2.493	1.121- 5.546
$< 35$ years ( $n=112$ )	10 (8.9%)	102 (91.1%)			
n=224	32 (14.2%)	192			

## DISCUSSION

Although economically proficient western women, who in their conscious decision, make independent choice in postponing first and subsequent pregnancies with building professional career advancement or educational accomplishments with affordability and access to ARTs.<sup>7-9</sup> The scenario of women in AMA in Nepal is different and seldom is based on the desire for male child, second marriage and carelessness to the use effective contraceptives

It is interesting to believe that AMA pregnancy is still prevailing as obtained from figures of maximum number of women being in the age group of 35-39 years (89.93%), followed by 40-44 years (10.71%) sharing similarity to other studies.

Diabetes, Gestational diabetes and Hypertensive disorder of pregnancy were independent of AMA so was the maternal delivery third stage complications of PPH. A double fold increase in the number of preterm labour in mother of AMA with intriguingly overall high percentage of preterm birth and entire preterm born acquiring Perinatal Intensive care Unit - PICU admission, is indeed being a matter of concern. Admission to nursery and PICU was significantly high consistent with similar observation.<sup>10,11</sup>

Except for the significant difference in the number of very low birth weight, twice as high in mother of AMA as compared to below 35 years ( $n=5:2$ ); the overall low birth

weight was observed in 40/224 (17.8%) without marked differences in relation to age, contrary to the report saying that the rate of fetal growth restriction increases in women in extremes of age.<sup>12</sup>

## CONCLUSION

Women of advanced maternal age (AMA) having found with fewer complications of preterm birth and same number of preterm newborn needing Pediatric Intensive Care Unit admission and very low birth weight newborn in comparison to its counterpart (mother under the age of 35 years), thus confers early booking, counselling, closely supervised antenatal and intrapartum care as integral part for promising result for all women especially mother with AMA

## RECOMMENDATIONS

Counselling should be done to women in advanced maternal age to overcome their anxiety. Encourage women to plan pregnancy before 35 years of age to eliminate the possible little risk of adverse maternal perinatal outcome.

Therefore, further studies are needed to examine the relationship between AMA and adverse pregnancy outcomes that are related to placental dysfunction to consider the underlying cause(s) for Pregnancy in advanced maternal is thought be a 'high risk' pregnancy however, in this study women in advanced maternal outcome had favorable perinatal outcome.

## LIMITATIONS

The main limitation of this study was that the results of this study are applicable to a narrow population of patients. The failure to examine the different population may be addressed in future studies. Other limitations include the single center population, small number of women in the sample with age > 40 years and the lack of data on race/ethnicity, subfertility issues and the reasons of women for delayed pregnancy, antenatal and intra partum complications, mode of delivery, gravida-parity status. The neonates were not followed after 7 days of life. To implicate this study further analysis is needed on large scale.

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