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Research Article

PREGNANCY OUTCOME IN ADVANCED MATERNAL AGE IN COMPARISON WITH YOUNGER PREGNANT WOMEN – A COMPARATIVE STUDY IN CENTRAL REFERRAL HOSPITAL, GANGTOK, SIKKIM

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ABSTRACT

Objectives: The aim of the study was to compare maternal and neonatal outcome in pregnancy in advanced maternal age (>35 years) in comparison with pregnancy outcome in younger mothers of age 20–34 years.

Methods: This was a retrospective and comparative study conducted in the Department of Obstetrics and Gynecology of Central Referral Hospital, Gangtok, Sikkim. Institutional ethical committee approved the study. One thousand three hundred and thirty-five women were included in this study. Data of these mothers were retrieved from the MRD records and reviewed. Pregnancy outcomes were studied in terms of antenatal, intranatal, and postpartum complications. Each adverse obstetrical outcome was assessed if it has made a significant association with maternal age. Perinatal outcome was also compared.

Results: The mean maternal age was significantly higher in Group A (38.2±0.66) as compared to Group Y (25.85±4.41) and the difference was found to be statistically highly significant (p<0.0001). LSCS rate was more in advanced maternal age group as compared to patients <35 years and the difference was statistically significant (p=0.0009). Comparison for both the groups for gestational diabetes, gestational hypertension, anemia, preterm labor, prelabor rupture of membranes, and postpartum hemorrhage shows these pathologies to be more common in Group A. In Group A, the common causes of LSCS were patient request (41.39%) followed by FGR with abnormal Doppler (26.01%) whereas in Group Y common indications for LSCS included previous LSCS (36.56%) patient request (27.56%). Group A had a higher incidence of low birth weight (52 vs. 65, p<0.0001), large-for-gestational-age babies (>4 kg) (15 vs. 12, p<0.0001), NICU admission due to low APGAR score (35 vs. 42, p<0.0001), and pre-term births (43 vs. 10, p<0.0001).

Conclusion: Advanced maternal age pregnancies are associated with increased incidence of maternal medical disorders, cesarean section, and postpartum haemorrhage as well as adverse perinatal outcome.

Keywords: Advanced maternal age, Cesarean section, Post-partum hemorrhage, Neonatal outcome.

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INTRODUCTION

Although there is slight controversy about what is an advanced maternal age most of the studies and researchers have taken the age above 35 years to be advanced maternal age [1]. However, it needs to be mentioned at the outset that many studies have recommended cutoff age to be 40 years for defining advanced maternal age (AMA). With changing social scenarios, more and more couples are opting for pregnancies after the age of 35 years.

Childbearing later in life is a situation which has become increasingly evident in the last few years and will become much more in future existence.

As per statistics, there is an upward trend in women literacy, career, and employment, and plan for pregnancy comes at a later stage. Increasingly, women are delaying pregnancy until the 3rd or 4th decade of life. The reasons for the delay are multiple including late marriages, contraception techniques, child-care costs, higher education, and career prospects. The impact of advanced maternal age and parity on pregnancy outcome has become increasingly important as pregnancy in women aged >35 years are considered high risk.

Advanced maternal age increases pregnancy-related risks and obstetric complications. Several studies have described the risks, complications, and obstetric outcomes related to pregnancy in women aged over 35 years [4] Compared to younger women, women over 35 years are at increased risks of complications such as gestational diabetes, placenta praevia, pre-eclampsia, and miscarriage as well as cesarean sections. Rate of assisted conception is significantly higher among women aged 35 years and above [5] Various studies on neonatal outcome in cases of AMA pregnancies have reported that the morbidities such as incidence of preterm deliveries, low birth weight, and NICU admissions are significantly high in babies born to mothers >35 years as compared to babies born to mothers between 19 and 35 years. Whether these adverse outcomes are due to AMA or due to the presence of comorbidities present in AMA women needs to be further studied [6]. Older women are more likely to be having coexisting medical conditions such as hypertensive disorders, diabetes mellitus, and other chronic diseases, for which they are already taking medication. These chronic medical conditions may further complicate their pregnancies.

While many studies have explored risks tied to advanced maternal age, there are controversies regarding whether these risks are associated with advanced maternal age per se or it is the result of increased incidence of co-morbidities such as diabetes mellitus and hypertension that are more likely to be present in women with AMA pregnancies [8]. Some studies have suggested that adequate follow-up during prenatal period and optimum care during childbirth make maternal and neonatal outcome similar to those of younger pregnant women [9]. These conflicting conclusions drawn by various studies

have created a void in understanding comparative pregnancy outcomes between AMA pregnancies and younger pregnant women. Existing studies often focus on isolated complications or risk factors, offering a fragmented perspective. Few studies have addressed the issue of the collective impact of advanced maternal age on obstetric and neonatal outcomes [10].

With this present scenario, obstetricians are facing the challenge of treating elderly pregnancies, thereby supporting the importance of addressing the risks associated with pregnancy later in life.

With this background, we conducted this retrospective comparative study to compare maternal and neonatal outcome in pregnancy in advanced maternal age (>35 years) in comparison with pregnancy outcome in younger mothers of age 20–34 years.

METHODS

This was a retrospective comparative study conducted in the department of Obstetrics and gynaecology of Central Referral Hospital, Gangtok, Sikkim. Institutional ethical committee approved the study. 1335 women were included in this study on the basis of a predefined inclusion and exclusion criteria. All women who fall within either of these groups were included regardless of previous medical, surgical, or obstetric history. All deliveries took place in CRH conducted by doctors. They were divided into two groups depending on the age of patient.

Group A: 339 women above the age of 35 years (Advanced maternal age) were included as study group.

Group Y: 996 young pregnant patients having age between 19 and 35 were taken as reference group.

Data of these mothers were retrieved from the MRD records and reviewed. Details of mothers who gave birth in CRH from May 1, 2022, to April 30, 2023, through their medical charts were selected using systematic sampling. Variables such as sociodemographic status, obstetric history, and mode of delivery, and adverse obstetrical and perinatal outcomes were recorded and analyzed.

Pregnancy outcomes were studied in terms of antenatal, intranatal, postpartum complications, each adverse obstetrical outcome was assessed if it has made a significant association with maternal age. Each perinatal outcome was tested to see in terms of preterm delivery, post-dated delivery, low birth weight, low APGAR score, NICU admissions, and perinatal mortality were recorded.

Maternal and perinatal outcome was compared in both groups in terms of maternal complications, type of delivery, incidence of postpartum hemorrhage, and neonatal outcome.

Statistical analysis was done with the help of SPSS version 21.0 software. Quantitative data were presented as mean and standard deviation. Qualitative data were presented with incidence and percentage tables. For quantitative data, unpaired t-test was used and for qualitative data, Chi-square test was used. $p<0.05$ was taken as statistically significant.

Inclusion criteria

The following criteria were included in the study:

1. Advanced maternal age pregnant women (aged above 35 years) admitted for delivery (Group A).
2. Young pregnant patients (Age between 19 and 35) enrolled in control group.

Exclusion criteria

1. Teenage pregnancies were excluded from the study.

RESULTS

Out of the 1335 retrospectively analyzed cases, there were 996 (74.61%) women below the age of 35 and remaining 339 (25.39%) cases were above age of 35 years. The mean maternal age was significantly higher in Group A (38.2±0.66) as compared to Group Y (25.85±4.41) and the difference was found to be statistically highly significant ($p<0.0001$) (Fig. 1).

The mode of delivery data revealed significant differences between Group A and Group Y. In Group A, normal deliveries constituted 18.88% of cases, while emergency or elective lower segment cesarean sections (LSCS) were predominant at 80.53%. Forceps/vacuum deliveries were minimal at 0.59%. In contrast, Group Y exhibited a different distribution, with 27.91% normal deliveries, 70.68% emergency or elective LSCS, and 1.41% forceps/vacuum deliveries. LSCS rate was more in advanced maternal age group as compared to patients <35 years and the difference was statistically significant ($p=0.0009$) (Table 1).

Comparison for both the groups for gestational diabetes, gestational hypertension, anemia, preterm labor, premature rupture of membranes, intrahepatic cholestasis of pregnancy, hypothyroidism in pregnancy, antepartum hemorrhage, fetal growth restriction with abnormal Doppler, oligohydramnios, polyhydramnios, aneuploidy, twin gestation, myoma complicating pregnancy, operative intervention (cesarean section), and postpartum hemorrhage showed that all these conditions were more common in advanced maternal age group as compared to young patients below 35 years of age and the difference was found to be statistically highly significant in almost all cases ($p<0.0001$) (Table 2).

In Group A, the common causes of LSCS were patient request (41.39%) followed by FGR with abnormal Doppler (26.01%), fetal distress (6.59%), twin gestation (5.86%), and severe pre-eclampsia (5.49%). In Group Y, common indications for LSCS included previous LSCS (36.56%) patient request (27.56%), failed induction (13.64%), and 84 (11.93%) (Table 3).

Group A had a higher incidence of low birth weight (52 vs. 65, $p<0.0001$), large-for-gestational-age babies (>4 kg) (15 vs. 12, $p<0.0001$), NICU admission due to low APGAR score (35 vs. 42, $p<0.0001$), and preterm births (43 vs. 10, $p<0.0001$). However, there was no statistically significant difference in intrauterine deaths (IUD) between the two groups (3 vs. 2, $p=0.1073$) (Table 4).

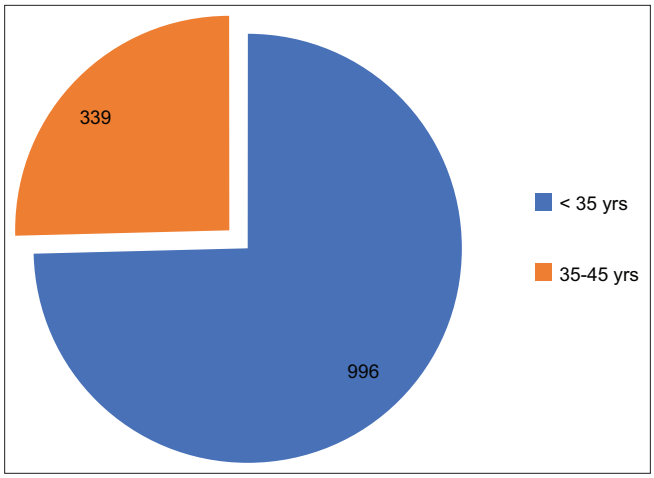

Fig. 1: Age distribution of studied cases

Table 1: Comparison of mode of delivery in both the studied groups

Mode of delivery	Mode of delivery			
	Group A (%)		Group Y (%)	
Normal delivery	64	18.88	278	27.91
Emergency or elective LSCS	273	80.53	704	70.68
Forceps/vacuum delivery	2	0.59	14	1.41
Total	339	100.00	996	100.00

p=0.0009 (Significant)

Table 2: Comparison of various maternal factors in both groups

Maternal factors	Group A (339)		Group Y (996)		p-value
	No of cases	Percentage	No of cases	Percentage	
Gestational diabetes	124	36.58	12	1.20	<0.001
Gestational hypertension	116	34.22	22	2.21	<0.001
anemia	132	38.94	25	2.51	<0.001
Preterm labor	43	12.68	10	1.00	<0.001
Premature rupture of membranes	64	18.88	45	4.52	<0.0001
intrahepatic cholestasis of pregnancy	47	13.86	12	1.20	<0.0001
Hypothyroid in pregnancy	134	39.53	15	1.51	<0.0001
Antepartum hemorrhage	8	2.36	2	0.20	0.0004
Fetal growth restriction with abnormal Doppler	71	20.94	8	0.80	<0.0001
Oligohydramnios	63	18.58	7	0.70	<0.0001
Polyhydramnios	18	5.31	4	0.40	<0.0001
Aneuploidy	5	1.47	0	0.00	<0.0001
Twin gestation	18	5.31	2	0.20	<0.0001
Myoma complicating pregnancy	8	2.36	1	0.10	<0.0001
Operative intervention (cesarean section)	273	80.53	704	70.68	<0.0001
Postpartum hemorrhage	47	13.86	32	3.21	0.0001

Table 3: Comparison of Indications for LSCS In studied cases

Indication For LSCS	Group A		Group Y	
	No of cases (273)	Percentage	No of cases (704)	Percentage
Failed induction	8	2.93	96	13.64
Non-progress of labor	4	1.47	84	11.93
Fetal distress	18	6.59	8	1.14
Cephalopelvic disproportion	8	2.93	35	4.97
Placenta previa	5	1.83	1	0.14
Abruptio placenta	3	1.10	2	0.28
Patient request	113	41.39	194	27.56
Abnormal lie	6	2.20	12	1.70
FGR with abnormal Doppler	71	26.01	8	1.14
Severe pre-eclampsia	15	5.49	4	0.57
Previous LSCS	6	2.20	258	36.65
Twin gestation	16	5.86	2	0.28
Total	273	100	704	100

Table 4: Comparison of neonatal outcome in studied cases

	Group A (35–45y) n=339	Group Y (20–34y) n=996	p value
Low birth weight	52	65	<0.0001
Large for gestational age (>4 kg)	15	12	<0.0001
NICU admission (low APGAR score)	35	42	<0.0001
Preterm babies	43	10	<0.0001
IUD	3	2	0.1073

DISCUSSION

In our study, the mean maternal age was significantly higher in Group A (38.2±0.66) compared to Group Y (25.85±4.41) and the difference was found to be statistically highly significant and advanced maternal age pregnancies had a significantly higher mean parity of 3.12±0.53 compared to young pregnancies with a mean of 2.19±0.34. In our study, the mode of delivery data revealed significant differences between Group A and Group Y. In Group A, normal deliveries constituted 18.88% of cases, while emergency or elective lower segment cesarean sections (LSCS) were predominant at 80.53%. Forceps/vacuum deliveries were minimal at 0.59%. In contrast, Group Y exhibited a different distribution, with 27.91% normal deliveries, 70.68% emergency or elective LSCS, and 1.41% forceps/vacuum deliveries.

Dunn *et al*. conducted a study to determine if advanced maternal age (AMA) is associated with emergency cesarean section (CS) following induction of labor (IOL) [11]. A total of 7459 women were included (≥38 years n=718, 9.6%; <38 years n=6741, 90.4%). AMA women had similar rates of unassisted vaginal births and CS but fewer instrumental deliveries compared to women <38 years. When controlled for confounders, AMA was independently associated with a two-fold increase in birth by CS following IOL There were no differences in neonatal outcomes. Similar increased incidence of cesarean sections among AMA pregnancies have also been reported by the authors such as Davey *et al.* [12] and Jeong *et al*. [13].

Comparison for both the groups for gestational diabetes, gestational hypertension, anemia, preterm labor, and prelabor rupture of membranes as well as post-partum hemorrhage showed that all these pathologies were more common in women with advanced maternal age as compared to young women. Lamminpaa *et al*. conducted a study to compare the obstetric outcomes in primiparous and preeclamptic women younger and older than 35 years [14]. The sample contained women under 35 years of age (N=15,437) compared with those 35 and over (n=2,387) who were diagnosed with preeclampsia and had their first singleton birth. The study found that Women of advanced maternal age (AMA) exhibited more preeclampsia than younger women. They had more prior terminations, were more likely to have a body mass index (BMI) >25, had more *in vitro* fertilization (IVF) and other fertility treatments, and a higher incidence of maternal diabetes and chronic hypertension. Similar findings were also reported by the authors such as Cleary-Goldman *et al*. [15] and Pinheiro *et al*. [16].

The analysis of neonatal outcome showed that the incidence of low birth weight, birth asphyxia, and need for NICU admission was more in advanced maternal age group as compared to pregnancies in young women. However, this difference was not found to be statistically significant (p>0.05). Guarga Montori *et al.* conducted a study to assess the association between advanced maternal age and adverse perinatal outcomes in single pregnancies [17]. For this purpose, a cohort study was conducted using data from 27,455 singleton births. Similar to our study this study also found that the risks of fetal death, neonatal admission, and small for gestational age were greater after 40 years of age. Similar perinatal outcome was also reported by the authors such as Jacobsson *et al.* [18].

Centre for Disease Control and Prevention (CDC) has reported a gradual increase in mean age of pregnant women. Globally, there has been a trend toward initiating pregnancy later, with most countries noting an increasing age at conception thereby supporting the importance of addressing the risks associated with pregnancy later in life [19]. In a small state like ours, that is, Sikkim with declining fertility rate, government is urging women to have more children. In a bid to boost the fertility rate, the government is encouraging people to have more children with Increments and incentives and infertility treatment schemes which has added and motivated women in advanced age to pursue fertility treatments and plan conception [20].

Thus, pregnancy counseling and pregnancy care recommendations can be tailored better toward the individual if specific patient age is considered. If available, a genetic counselor along with good antenatal fetal surveillance for pregnant individuals to assess growth with anticipate delivery on time to improve neonatal outcome.

Recommendation is that obstetrician–gynecologists and other obstetric care professionals be aware of the disproportionate rates of most adverse maternal and perinatal outcomes.

CONCLUSION

Advanced maternal age pregnancies are associated with increased incidence of Caesarean section, instrumental deliveries, and postpartum hemorrhage. In terms of neonatal outcome AMA pregnancies were found to be associated with increased incidence of low birth weight, birth asphyxia, and need for NICU admission.

Identifying the outcomes of AMA pregnancy will be useful in designing effective sensitization programs for couples and empowering them about informed choices for pregnancies during advanced maternal age. Furthermore, the result of this study can be utilized by concerned bodies to optimize natal care given for advanced aged mothers. This study seeks to provide evidence-based clinical recommendations for minimizing adverse outcomes associated with pregnancy with anticipated delivery at an advanced maternal age. We would like to infer from evidence and reasoning that older women managed by good obstetric care and delivered in tertiary care can expect good obstetric outcomes.

CONFLICTS OF INTEREST

None.

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