



## Advanced maternal age and obstetric outcome

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**OBJECTIVE(S) :** To evaluate the maternal and perinatal outcome of pregnancies in women aged 35 years or more at the time of delivery and to compare them with their younger counterparts aged between 20 and 29 years.

**METHOD(S) :** A retrospective review of hospital deliveries after 20 weeks of gestation between January 2000 and June 2004 was done. The maternal and perinatal outcomes of pregnancies in women aged 35 years or more (study group n=268) were compared with those in women between 20 and 29 years of age, their younger counterparts (control group n=268). Mann-Whitney and Mantel Haenszel and chi square tests were used for statistical analysis.

**RESULTS:** The mean age in study group was 35.8 years ranging from 35 to 40 years. Mean parity was significantly high in study group ( $P < 0.001$ ). Bad obstetric history, history of infertility, and diabetes were significantly present in the study group ( $p < 0.02$ ). There was no significant difference regarding mode of delivery. Preterm labor and apgar less than 7 at 5 min was significant in study group.

**DISCUSSION(S) :** Women aged 35 years or more constitute a high risk group but they can expect a good pregnancy outcome with careful and watchful antenatal care and delivery.

**Key words:** elderly gravida, pregnancy outcome

### Introduction

Advanced maternal age beyond 35 years is considered to have more adverse pregnancy outcomes as compared to those in younger women. Many studies have found adverse effects in the form of preterm delivery<sup>1</sup>, low birth weight<sup>2</sup>, perinatal mortality and morbidity<sup>3</sup>, and increased prevalence of medical disorders like hypertension, diabetes and placenta previa<sup>4,5</sup>. Majority of these studies are from developed countries and from western population. There is hardly any documented study from India, where relatively poor socioeconomic status, cultural practice of early marriage, and concept of large family size predominate. Therefore we planned to evaluate the data in our set up. The teaching hospital at which this study was performed has a reputation

for attracting population of all socioeconomic strata. It would therefore seem that the population at this hospital is matched for all socioeconomic status and race

### Methods

This is a retrospective study based on the labor records of women who delivered from January 2000 to June 2004. There were 268 booked women aged, 35 years or more at the time of delivery (study group). We compared their maternal and perinatal outcomes with those of women 20-29 years of age (control group n=268) delivering serially immediately after the women included in the study group. The power of the study is 90%. Women with high-risk pregnancies, who were transferred from other hospitals were excluded in order to minimize referral bias and to ensure that the study group would reflect a uniform obstetric population. Deliveries before 20 weeks and of babies weighing <500g were excluded. The major maternal parameters studied were age at the time of delivery, parity, gestational age, presentation, obstetric complications, medical disorders associated with pregnancy, mode of delivery, and history of infertility. History and/or development of hypertension, diabetes, thyroid

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abnormality, cardiac disease, asthma, epilepsy, and tuberculosis constituted medical disorders. Fetal parameters studied were fetal weight, congenital anomalies, apgar score at birth (less than 7 at 5 min.), still births, preterm delivery and intrauterine growth restriction (IUGR). We did not assess outcomes such as spontaneous abortion and chromosomal abnormalities since information on these and induced abortion of chromosomally abnormal fetus was not available in our labor records.

Women were classified as diabetic if they had a history of preexisting diabetes or gestational diabetes mellitus during the pregnancy (i.e. at least two abnormal values on glucose tolerance tests). Women who had a diagnosis of preexisting hypertension were labeled as chronic hypertensives whereas those who had hypertension after 20 weeks of gestation with proteinuria or edema or both were labeled as having pregnancy induced hypertension. Intrauterine growth restriction was considered when weight was less than 10th percentile. Birth weight less than 2500g was designated as low birth weight. When delivery occurred before 37 completed weeks of gestation, it was considered preterm.

Statistical analyses were performed using Mann-Whitney and the Mantel Haenszel chi square tests as appropriate. The

software used for statistical analysis was Epi Info.  $P < 0.05$  was considered significant.

## Results

During the study period, 268 women aged 35 years or more delivered. Their mean age was 35.8 years. In the control group mean maternal age was 25.3 years.

Mean parity in the study group was 1.69 (range of 0 to 9) whereas in the control group it was 0.73 and range was from 0 to 7. Mean parity was significantly high in the study group ( $P < 0.001$ ).

In the study group bad obstetric history was significantly high (35/268, 13.1%; vs 18/268, 6.7%;  $P = 0.02$ ) and so was history of infertility (16/268, 5.9% vs 5/268, 1.9%;  $P = 0.02$ ).

Of the antenatal complications only pregnancy induced hypertension was significantly higher in the study group (79/268, 29.4% vs 44/268, 16.4%;  $P < 0.001$ ) (Table 1).

Of the medical complications, only diabetes was significantly higher in the study group (11/268, 4.1%, vs 2/268, 0.7%;  $P = 0.02$ ) (Table 2). There were no significant differences in modes of delivery between the two groups (Table 3)

**Table 1. Antenatal complications**

Complication	Study group (n=268) Number (Percent)	Control group (n=268) Number (Percent)	P value
Preterm labor	79 (29.4)	44 (16.4)	0.0004
Pregnancy induced hypertension	27 (10.1)	19 (7.1)	NS
Ante partum hemorrhage	9 (3.3)	3 (1.1)	NS
Intrauterine growth restriction	24 (8.9)	21 (7.8)	NS
Multiple pregnancy	4 (1.5)	2 (0.7)	NS
Malpresentation	16 (5.9)	11 (4.1)	NS

NS - Not significant.

**Table 2. Maternal medical complications**

Complication	Study group n=268 Number (Percent)	Control group n=268 Number (Percent)	P value
Diabetes	11 (4.1)	2 (0.7)	0.02
Essential / Chronic Hypertension	6 (2.2)	1 (0.35)	NS
Cardiac Disease	10 (3.7)	10 (3.7)	NS
Epilepsy	1 (0.35)	2 (0.7)	NS
Hypothyroidism	3 (1.1)	3 (1.1)	NS
Anemia (Hb<10gm%)	8 (2.9)	3 (1.1)	NS
Hepatitis/Jaundice	1 (0.35)	2 (0.7)	NS
Tuberculosis	4 (1.5)	0 (0)	NS
Bronchial asthma	1 (0.35)	2 (0.7)	NS

NS - not significant

**Table 3. Mode of delivery**

Mode of delivery	Study group n=268 Number (Percent)	Control group n=268 Number (Percent)	P value
Vaginal delivery	127 (47.4)	133 (49.6)	NS
Cesarian delivery	131 (48.9)	121 (45.1)	NS
Instrumental delivery	10 (3.7)	14 (5.3)	NS

NS - Not significant

**Table 4. Fetal and neonatal outcome**

Variables	Study group n=268 Number (Percent)	Control group n=268 Number (Percent)	P value
Apgar <7 at 5 minutes	36 (13.5)	12 (4.5)	0.0005
Still Birth	17 (6.3)	9 (3.3)	NS
Congenital malformation	9 (3.3)	8 (2.9)	NS
Low birth weight (<2500g)	64 (23.9)	64 (23.9)	NS

Mean birth weight - 2702 ± 65g in the study group vs 2676 ± 2669 in the control group (P value NS)

NS = Not Significant

In the perinatal outcomes only apgar <7 at 5 minutes indicating fetal distress, was significantly higher in the study group (36/268, 13.5% vs 12/268; P<0.001) (Table 4).

## Discussion

There are numerous studies which have compared the effect of advanced maternal age on pregnancy outcomes with varied results. Our study is different because it is probably an only Indian study where relation between advanced maternal age with pregnancy and perinatal outcome is compared.

Our study finds that except for history of bad obstetrics and infertility, occurrence of preterm labor, development of diabetes, and fetal distress indicated by apgar <7 at 5 minutes there were no difference between the two groups.

In a study by Edge and Laros (6), rate of preterm delivery was modestly elevated in the group of older women (p<0.05), similar findings is seen in this study even when corrected for potential confounder factors for preterm birth like increased parity, malpresentations, placenta previa, diabetes and hypertension.

Hypertension whether in the form of chronic hypertension or pregnancy induced hypertension was more in study group as compared to control but statistically insignificant. The same finding was reported by Goldman J et al whereas Bobrowski et al reported that rate of preeclampsia in

multiparous women ≥ 35 year old is three times more as compared to younger counterparts. Similarly the rate of chronic hypertension is five times more in advanced maternal age.

The increased risk of gestational diabetes and placenta previa in advanced maternal age secondary to progressive vascular endothelial damage have been documented in the literature (4,7). In this study also, diabetes was significantly present in study group. Incidence of placenta previa and abruptio were more in study group as compared to control but statistically non significant.

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 estrogen receptors and anxiety by mother and obstetrician<sup>8,9,10,11</sup>. In this study no significant association between increase maternal age and operative interference was found and thus emphasizing the fact that vaginal delivery can be conducted safely in the particular group too, provided the labor is watched meticulously. However even after watchful labor, the incidence of cesarean is bit more with advanced maternal age group.

The frequency of low apgar score (<7) at 5 min was also assessed according to maternal age and the difference between the two groups was significant. The same finding was also noticed by Berkowitz et al<sup>1</sup>.

Fretts RC et al studied a relation between increased maternal age and the risk of fetal death and he concluded that even after controlling for recognized coexisting conditions that contribute to fetal death, women 35 years of age or older continued to have a risk of fetal death that was twice as high as that among their younger counterparts<sup>3</sup>. In our study, we find an increased incidence of still birth in advanced maternal age group (6.3%) as compared to younger mothers (3.3%) but 'p' value is non significant.

As started by Lee KS et al, advancing maternal age is associated with a decreased potential for fetal growth possibly reflecting biologic aging of maternal tissue and systems or the cumulative effects of diseases<sup>2</sup>. However in this study the incidence of low birth weight and congenital malformation was almost similar. Hence it needs further studies to support the above hypothesis.

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

#### References

1. Berkowitz GS, Skovron ML, PH Lapinski RH et al. Delayed child bearing and the outcome of pregnancy. *N Engl J Med* 1990; 322: 659-64.
2. Lee KS, Ferguson RM, Corpuz M et al. Maternal age and incidence of low birth weight at term: a population study. *Am J Obstet Gynecol* 1988; 158: 84-9.
3. Fretts RC, Schmittiel J, McLean FH et al. Increased maternal age and the risk of fetal death. *N Engl J Med* 1995; 333: 953-7.
4. Cleary-Goldman J, Malone FD, Vidaver J et al. Impact of maternal age on obstetric outcome. *Obstet Gynecol* 2005; 105: 983-90.
5. Bobrowski RA, Bottoms SF. Underappreciated risks of the elderly multipara. *Am J Obstet Gynecol* 1995; 172: 1764-70.
6. Edge VL, Laros RK. Pregnancy outcome in nulliparous women aged 35 or older. *Am J Obstet Gynecol* 1993; 168: 1881-5.
7. Abu-Heija AT, Jallad MF, Abukteish F. Maternal and perinatal outcome of pregnancies after the age of 45. *J Obstet Gynecol Res* 2000; 26: 27-30.
8. Bell JS, Campbell DM, Graham WJ et al. Can obstetric complications explain the high levels of obstetric interventions and maternity service use among older women? A retrospective analysis of routinely collected data. *BJOG* 2001; 108: 910-8.
9. Rosenthal AN, Paterson-Brown S. Is there an incremental rise in the risk of obstetric intervention with increasing maternal age? *Br J Obstet Gynaecol* 1998; 105: 1064-9.
10. Gordon D, Milberg J, Daling J et al. Advanced maternal age as a risk factor for cesarean delivery. *Obstet Gynecol* 1991; 77: 493-7.
11. Adashek JA, Peaceman AM, Lopez-Zeno JA et al. Factors contributing to the increased cesarean birth rate in older parturient women. *Am J Obstet Gynecol* 1993; 169: 936-40.