

## Original Research Article

# Study of the neonatal outcomes in babies born to elderly mothers and young mothers

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### ABSTRACT

**Background:** More and more women are focusing on obtaining higher education and reaching career objectives. This has in turn, lead to delayed marriage and child birth at a later age. Advanced maternal age at birth has been found to be associated with preterm delivery, low birth weight, intrauterine fetal death and increased perinatal morbidity and mortality. The aim of our study was to know the neonatal outcome in elderly mothers and young mothers, and to compare the neonatal outcome of these two groups.

**Methods:** Present study was a cross sectional, analytical case control study, done in babies delivered to mothers >35 years and <35 years. Information like period of gestation, birth weight, APGAR at 1 minute and 5 minutes, NICU admissions, neonatal outcome like respiratory distress, jaundice, convulsion, etc. were recorded in a proforma. Collected data was analysed using appropriate statistical tests.

**Results:** In the present study, total sample size was 460 (230 cases and 230 controls). Incidence of preterm deliveries, Low birth weight, NICU admissions were significantly more in case group (babies born to mothers >35 years) than the control group (babies born to mothers between 19 to 35 years).

**Conclusions:** It was observed that low birth weight, prematurity and NICU admissions were more common in babies born to elderly mothers.

**Keywords:** APGAR, Advanced maternal age, Low birth weight, Neonatal outcome

### INTRODUCTION

Women who are pregnant at the age of 35 years or more are referred as elderly mothers.<sup>1</sup> Nowadays more and more women are focusing on obtaining higher education and reaching career objectives. This has in turn, lead to delayed marriage and child birth at a later age. Advanced maternal age at birth has been found to be associated with preterm delivery, low birth weight, intra uterine fetal death and increased perinatal morbidity and mortality.<sup>2</sup> Increased maternal age has been regarded as a risk factor for complications in pregnancy. The association between increased maternal age and increased risk of chromosomal abnormalities and spontaneous abortion is

well known.<sup>3,4</sup> Advanced maternal age at birth has been found to be associated with gestational diabetes, pre-eclampsia, placenta previa, caesarean section (CS), placental abruption, preterm delivery, low birth weight, intrauterine fetal death and increased perinatal morbidity and mortality.<sup>5</sup> Majority of these studies are from developed countries and from western population. Several studies have shown that advanced maternal age is associated with a significantly increased risk for perinatal death.<sup>6,7</sup> However other studies have failed to show such an increase in mortality.<sup>8,9</sup> There are not many studies from India, where relatively poor socioeconomic status, cultural practice of early marriage, and concept of large family size predominate. The aim of our study was to

know the neonatal outcome of babies born to elderly mothers (>35 years) and mothers aged less than 35 years (19 years to 35 years) and to compare them.

## METHODS

The study was a cross sectional, analytical case control study done by going through the Medical Records of the mother/neonate admitted in Father Muller Medical College Hospital from 1<sup>st</sup> September 2015 to 31<sup>st</sup> August 2017. Cases were all babies born to elderly mothers (>35 years). Controls were selected in the ratio of 1:1.

Mothers between 19 to 35 years who delivered immediately after the case and by same mode of delivery were taken as controls. Neonates born to mothers with chronic illnesses of lungs, kidney and heart were excluded from the study.

Sample size was calculated using following formula.

$$N = 1.96 \times 1.96 (pq) / d^2$$

Where,

n= sample size

p = proportion of elderly pregnant women having an abnormal outcome

q= 1-p

d= absolute precision of 10

Data selected were compiled in Microsoft XL sheet, analysis was done by using software SPSS version 16.

Outcomes (period of gestation, low birth weight, APGAR, NICU admissions) of babies born to elderly mothers of age more than 35 years and babies born to mothers between 19 to 35 years were compared.

Statistical analysis was done using chi square test, confidence interval, odds ratio and fisher exact test.

### Operational definition

#### Preterm

Babies born before 37 completed weeks of gestation (258 days).<sup>10</sup>

#### Low birth weight (LBW)

Any neonate who at birth has a weight of less than 2,500 g irrespective of gestation.<sup>11</sup>

#### Small for gestational age

A neonate whose birth weight is <10<sup>th</sup> percentile (fenton growth chart) for gestational age or <2 standard deviations (SD) below the mean for the infant's gestational age.<sup>10</sup>

## RESULTS

In the present study, total sample size was 460, which included 230 cases of babies born to mothers >35 years and 230 controls which were born to mothers between 19 to 35 years.

Number of premature babies in case group were 49 (21%), and in controls 12 (5%). The chi square value was 25.87, P value was <0.0001 (95% CI: 2.53 - 9.52.), which was statistically highly significant, the odds ratio was 4.918. This implies that elderly mothers have 4.918 times more risk of delivering premature babies (Table 1).

**Table 1: Preterm and term babies born to mothers aged >35 years and <35 years.**

Mothers	Term	%	Preterm	%	Total
> 35 years	181	79	49	21	230
< 35 years	218	95	12	5	230
Total	399	86	61	14	460

Out of 230 cases, 21 babies (9%) had APGAR <7 at 1 minute and 5 (2%) babies had APGAR <7 at 5 minutes. Out of 230 controls, 11 babies (4%) had APGAR <7 at 1 minute and only 3 babies (1%) had APGAR <7 at 5 minutes, which was statistically non-significant.

Out of 230 cases, 167 cases (73%) had normal birth weight and 63 cases (27%) had low birth weight. Among 230 controls, 219 babies (95%) had normal weight at birth and only 12 babies (5%) had low birth weight. The chi square value was 41.44 and the P value was < 0.0001 (95% CI: 3.57-13.12). This finding was statistically highly significant with an odds ratio of 6.85. This implies that elderly mothers have 6.85 times more risk of delivering LBW babies (Table 2).

**Table 2: LBW in babies born to mothers aged >35 years and <35 years.**

Mothers	Normal	%	LBW	%	Total
>35years	167	73	63	27	230
<35years	218	95	12	5	230
Total	385	84	75	16	460

**Table 3: AGA and SGA in babies born to mothers aged >35 years and <35 years.**

Mothers	AGA	%	SGA	%	Total
>35 years	208	90	22	10	230
<35 years	229	99.5	1	0.5	230
Total	437	95	23	5	460

Out of 230 cases, 22 cases (10%) were SGA and among controls only 1 baby was born SGA. The chi square value was 20.18, the P value <0.0001 (95% CI: 3.23 - 181.28) which was statistically highly significant. The odds ratio was 24.22. This finding implies that elderly mothers have

24.22 times more risk of delivering SGA babies (Table 3).

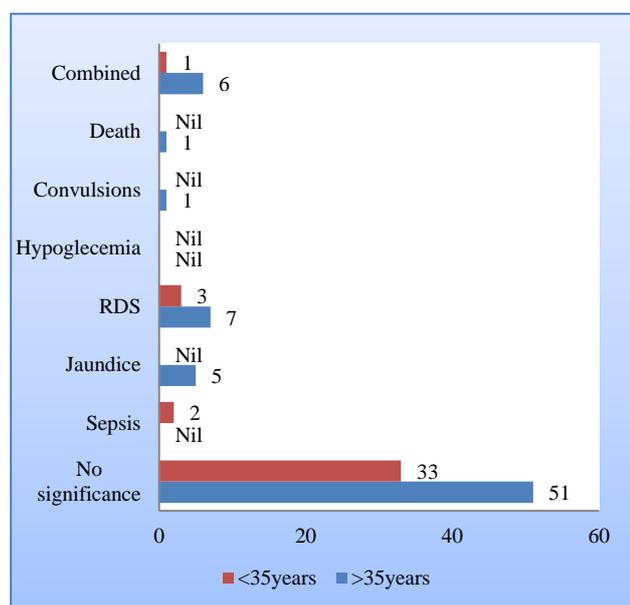
3 cases out of 230 born to mothers with > 35 years of age were still born and there were no still birth in controls ( $\leq$  35 years). Fisher exact value was 0.24.

Among case group, 71 babies (31%) had NICU admission and 39 babies (17 %) had NICU admission in the control group. The chi square test was 12.23, the P value was < 0.00047 (95% CI: 1.4 - 3.4) which was statistically highly significant with an odds ratio of 2.19 (Table 4).

**Table 4: NICU admissions in babies born to mothers aged >35 years and <35 years.**

Mothers	Mother side	%	NICU	%	Total
>35 years	159	69	71	31	230
$\leq$ 35 years	191	83	39	17	230
Total	350	76	110	24	460

Among 71 cases who had NICU admission, 20 cases had significant events in NICU, which included sepsis, jaundice, RDS, convulsions and death. Out of 39 controls shifted to NICU, only 6 had significant events. The chi square test was 2.28, the P value was 0.13 (95% CI: 0.78 - 5.93) with an odds ratio of 2.15 (Figure 1).



**Figure 1: Significant events in babies admitted to NICU.**

## DISCUSSION

The present study included 460 babies. Out of which 230 babies born to mothers aged more than 35 years were taken as cases and 230 babies born to mothers aged 19 to 35 years were taken as controls.

Out of 230 mothers above 35 years, 49 (21%) delivered prematurely in comparison with 12 (5%) mothers who delivered prematurely in the control group (mothers aged 19 to 35 years). The p value was <0.0001, which was statistically highly significant. This finding implies that the incidence of premature babies in elderly mothers was 4 times more than the control group. Minoo R et al and Berkowitz GS et al found similarly, that incidence of preterm deliveries was higher in mothers aged 35 years or more.<sup>12,13</sup>

In the present study group, 63 (27%) babies were low birth weight in comparison with 12 (5%) babies in the control group. The Chi square value was 41.44 and p value was <0.0001, which was again statistically highly significant. This finding suggested that, elderly mothers had 6 times higher chance of delivering low birth weight babies in comparison to younger mothers. Studies by Minoo R et al and Berkowitz GS et al found that the incidence of LBW babies was more in elderly mothers than the younger control group.<sup>12,13</sup>

Babies born to elderly mothers had lower APGAR scores at birth (<7 at 1 minute and 5 minutes) in comparison to babies born to mother's aged less than 35 years. P value of APGAR <7 at 1 minute was 0.06 and fisher exact value of APGAR <7 at 5 minutes was 0.724. These findings were statistically non-significant. Ates S et al found that 25% of babies in the study group had low APGAR score at 5 minutes and none in the control group. P value of APGAR <7 at 5 minutes was 0.032, which was statistically significant.<sup>14</sup>

In the present study, 22 (10%) babies were SGA in the case group and only one (0.5%) baby was born SGA in the control group. The p value was <0.0001. Statistically these values were highly significant. Odds ratio was 24.22, implying that elderly mothers have 24 times more chance of delivering SGA babies.

71 (30%) babies in our case group had NICU admissions in comparison with 39 (17%) babies in the control group. 20 (8%) babies had significant NICU events in case group, whereas 6 (3%) babies had significant NICU events in control group. The p value for NICU admission was 0.00047, which was statistically highly significant. This finding suggested that NICU admissions were more in babies born to elderly mothers in comparison to babies born to mothers between 19 to 35 years. Study done by Seda A and Gonca B in Turkey, also found that NICU admission was more frequent in babies born to older women although the difference was not statistically significant.<sup>14</sup>

Among 71 (30%) cases who had NICU admission, 20 (8%) cases had significant events in NICU, which included sepsis, jaundice, RDS, convulsions and death. Out of 39 (17%) controls shifted to NICU, only 6 (3%) had significant events.

## CONCLUSION

In our study, incidence of LBW, SGA, Prematurity and NICU admissions was more in babies born to elderly mothers than babies born to mothers aged  $\leq 35$  years. These findings suggest that babies born to elderly mothers have high morbidity.

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