

Maternal and Foetal Outcome in Women of 20-25 Years Age Group and Above 35 Years Age Group in a Tertiary Care Hospital in Eastern India: A Prospective Comparative Observational Study

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ABSTRACT

Introduction: Advanced maternal age is often associated with increased risk of pre-eclampsia, gestational diabetes, incidental medical problems, aneuploidy, and miscarriage. While it may sound overwhelming and translates into increased maternal mortality, but most mothers in their forties deliver satisfactorily and should not be deterred from conceiving unless there are specific issues for concern. In our study we aimed to clinically evaluate the maternal and foetal outcome in women of 20-25 years age group and those above 35 years age group.

Material and methods: Our study comprised of two groups of antenatal patients depending on their age- more than 30 years & 20-25 years, each group with 50 patients, and who attended our hospital during a span of 18 months. It was a prospective observational study with appropriate statistical analysis.

Results: In our study, the incidence of women aged ≥ 35 years (AM) was 19.3%. Of them, 76% were working women. This finding was statistically significant. Higher education was more common in AM. Sixty-four percent of AM who delivered in our hospital were booked cases. As expected multiparity was common in the AM, i.e. 66%. But a significant proportion of women (i.e. 34%) in AM were pregnant for the first time as compared to mothers aged 20-25 years (YM) (48%). In the AM, 48% had history of infertility, out of which 21 cases were primary and 3 cases were secondary infertility. This was statistically significant. The commonest previous pregnancy complication in both groups was pregnancy induced hypertension (PIH). In the current pregnancy, 66% of AM had undergone C-section whereas 30% of YM had C-section. This finding was statistically significant. The AM had 6% still births and 4% early neonatal deaths. The incidents of still births were 2% and early neonatal deaths were 6% in the YM. The commonest neonatal morbidity in AM was admission to neonatal intensive care unit (NICU) (22%). The common congenital anomalies seen in babies born to AM were neural tube defect (6%), club foot (4%) and tracheoesophageal fistula (TEF) (2%). The occurrence of congenital anomalies in AM was a statistically significant finding. The median duration of hospitalization of the AM and YM were 7 and 4 days, respectively. The range of duration of hospitalization in AM was 7-14 days. A 6% mortality rate was seen in the YM.

Conclusion: Child bearing at an advanced age is accompanied by a higher rate of complications like infertility, pre-eclampsia, placenta previa and gestational diabetes mellitus. The incidence of adverse foetal outcome such as congenital anomalies and admission to neonatal intensive care unit is also higher at increased age of mother. But despite all these adversities, the risk for pregnancy in elderly women is much lower than previously acknowledged due to improved healthcare facilities and advanced obstetrical care.

Keywords: Maternal Foetal Outcome, Advanced Age Pregnancy, Gestational Diabetes Mellitus, Infertility, Perinatal Morbidity

INTRODUCTION

The times have changed radically, and the Indian woman of today is no longer reconciled to her traditional role as a mere housewife, a mother, or a daughter. Whether it is higher education or the general and fast spreading enlightenment about rights and privileges and the concepts of equality between man and woman, that are responsible for the distinctly notable awakening among this section of mankind it is difficult to say.

In the late 1960s and early 1970s there was a decrease in the number of live births in general and a decrease in the proportion of mother aged 35 years and older. In the last three decades there has been a trend toward deferred childbearing, especially among healthy, well educated women with career opportunities, the proportion of pregnant women aged 35 years and older varies from country to country. Both socioeconomic circumstances and the nature of the population of elderly women have changed with time. Formerly pregnant women aged 35 years and older tended to have several unplanned children, whereas today the proportion of first births to "elderly" pregnant women is growing.

During the last decade of this country, a rather impressive proportion of Indian woman over the age of 35 years had babies, occurred as the result of rising education levels, effective means of birth control and increasing participation

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of women in the work force. Indeed, families that include both male and female wage earners are quite typical in India today. Other factors affecting birth rate undoubtedly include the higher cost of raising children and the availability of legal abortion. Many are choosing to delay childbearing in lieu of career goals but are yet unwilling to abandon motherhood.

Current study aimed to note the number of pregnant women in the age group of ≥ 35 years attending antenatal outdoor and indoor of our hospital and follow up their pregnancy irrespective of parity in singleton pregnancy and study their obstetrical outcome in comparison with mothers aged 20-25 years, to note the incidence of obstetrical complications in pregnant women aged ≥ 35 years in comparison with mothers aged 20-25 years, to observe the incidence of medical and surgical complications in pregnant women aged ≥ 35 years in comparison with mothers aged 20-25 years and to study foetal and neonatal complications like low birth weight, spontaneous abortions, congenital malformations, preterm delivery, still birth or perinatal death in pregnant women aged ≥ 35 years in comparison with mothers aged 20-25 years with special reference to the liquor volume and placental weight.

MATERIAL AND METHODS

The present study was a prospective observational comparative case-control study which was carried out at the Department of Obstetrics and Gynaecology, IPGME&R & SSKM Hospital, Kolkata, during the period 1st June 2010 to 30th June 2011. One hundred antenatal patients, of whom 50 belonging to the age group of ≥ 35 years (Case) (Advanced-aged mothers' group= AM) and 50 belonging to the age group 20-25 years. (Control) (Younger mothers' group= YM) were evaluated. All clinically normal antenatal mothers with singleton viable foetus were included in the study. Antenatal mothers with multifoetal pregnancy and those with major medical health problems like acute/chronic renal failure, chronic hypertension, diabetes mellitus, chronic liver diseases, cardiovascular disorders, connective tissue disorders or neurological diseases as well as alcoholism & malignant neoplasm were excluded from the study.

A detailed history including patients' age, educational status, occupation, socio-economic status, booked/ un-booked case, no of visits to antenatal clinic., etc. were taken. They

were interviewed for elicitation of history including- age of marriage, last menstrual period, estimated date of delivery, infertility, use of any contraceptive or postponement of pregnancy, previous obstetrical history, present pregnancy complaints, family history, past medical and surgical history. They clinically examined and per vaginal examination was done wherever indicated. Routine investigations of blood and urine were done as per departmental protocol. Ultrasonography for fetoplacental profile and measuring the amniotic fluid index between 36th–38th week of gestation other than the sonography at first trimester for dating-scan and second trimester to rule out congenital foetal anomaly, were done. Patients were also evaluated based on their obstetric outcome (with special reference to placental weight and whether labour was spontaneous or induced), peripartum maternal complications, foetal complications, period of hospital stay etc.

STATISTICAL ANALYSIS

Standard, appropriate statistical analysis of the observational data (such as history, clinical examination, obstetrical outcome, peripartal complications, foetal complications etc) in the population under study was done. Statistical analysis had been done using the software SPSS Version-11.0 Chicago. Approximate statistical technique by using- Chi-square test & students t-test were applied to establish the analysis and evaluate the study wherever applicable.

RESULTS

The total number of antenatal patients who delivered in SSKM Hospital from 1st June 2010 to 30th June 2011 was 2586. Of them 499 were women aged ≥ 35 years (AM) giving an incidence of 19.3% in our study. Age distribution of AM was as follows - 78% were in the age group 35-39 years while remaining 22% were in the age group 40-45. The percentage of AM who came from upper middle class, lower middle class and poor families were 20%, 54% and 26% respectively as compared to 14%, 30% and 56% respectively of mothers aged 20-25 years (YM). In the AM, 76% were working women whereas only 46% of YM were working. This was statistically significant ($p=0.021$) (Table-1). The education level, especially higher education

Variables	>35 years (in %) (AM)	20-25 years (in %) (YM)	X2 test	P value	Remarks
Occupation	76	46	9.46	0.0021	Significant
Infertility	48	24	6.25	0.0124	Significant
LSCS	66	30	12.98	0.0003	Significant
Threatened abortion	8	10	0.12	0.7267	-
PIH	6	14	1.78	0.1824	-
GDM	8	4	0.71	0.3997	-
Oligohydramnios	10	12	0.10	0.7492	-
PTD	14	18	0.30	0.5853	-
PPH	6	10	0.54	0.4609	-
Wound Infection	6	4	0.21	0.6463	-
Maternal Mortality	-	6	1.37	0.2410	-
Congenital anomaly	12	-	4.43	0.0352	Significant

Table-1: Statistical Analysis

was more common in AM. 56% were educated up to higher secondary level while 40% were university level. On the contrary, amongst the YM, 46% were illiterate and another 30% studied till 8th standard in school. Forty percent (20 cases) of AM were married for less than 2 years, reflecting late marriage does not necessarily complicate conception.

Sixty-four percent of AM who delivered in our hospital were booked cases whereas 46% mothers belonging to YM were booked. The remaining 36% of pregnant women in the AM who were unbooked, were referred cases from outside due to multiple complications. As expected multiparity was common in the AM, i.e. 66%. But a significant proportion of women (i.e. 34%) in AM were pregnant for the first time as compared to YM (48%). In the AM, 48% had history of infertility, out of which 21 cases were primary and 3 cases were secondary infertility. The current pregnancy was resulted from infertility treatment in 11 cases. On the contrary, 24% in YM had history of infertility. This was statistically significant ($p=0.0124$) (Table-1).

Thirty-three cases of AM and 26 cases of YM were multiparous. Six percent of AM had vaginal delivery in the previous pregnancy as compared to 15.3% of vaginal delivery in YM. The rates of previous caesarean section (C-section) were 60% in AM and 11.5% in YM. In the previous pregnancy, spontaneous abortion rate was 3% in AM as compared to 23% in YM. But medical termination of pregnancy (MTP) rate was higher in YM as compared to AM i.e. 7.6% and 3% respectively. The rates of stillbirth in previous pregnancies were 9% in AM and 19.2% in YM. One case of early neonatal death was seen in both groups. The commonest previous pregnancy complication in both groups was pregnancy induced hypertension (PIH), which was 6% & 19.2% in the AM & YM, respectively.

In the current pregnancy, 26% of AM had vaginal delivery whereas it was 52% in YM. Majority of patients in both AM and YM had spontaneous onset of labor. Sixty-six percent of AM had undergone C-section whereas 30% of YM had C-section. This finding was statistically significant ($p=0.0003$) (Table-1). The remaining patients had forceps & ventose deliveries. Out of the AM who had C-section, 84% had elective lower (uterine) segment Caesarean section (LSCS) and major indication was elderly gravida, followed by post C-section and associated obstetrical and medical complications. Fifteen percent had emergency C-section for which the most common indication was fetal distress. In YM, C-section rate was 30%. Among them 60% had emergency C-section, the common indication was intrapartum fetal distress. The remaining 40% had elective C-section and the major indication was Cephalopelvic disproportion (CPD).

The common peripartur complications in AM were preterm delivery (PTD) (14%), oligohydramnios (10%), Rh-negative (10%), gestational diabetes mellitus (GDM) (8%) and threatened abortion (8%). The other complications included PIH, postpartum hemorrhage (PPH), wound infection, blood transfusion, placenta previa, anaesthetic complications, and eclampsia (6% each) and postdated delivery (4%). The common complications in YM were PTD (18%), PIH

(14%), oligohydramnios (12%), PPH, threatened abortion, blood transfusion (10% each), Postdated pregnancy (8%), gestational diabetes mellitus, wound infection, Rh-negative, eclampsia (4% each) and placenta previa (2%). A 6% mortality rate was seen in the YM.

The AM had 6% still births and 4% early neonatal deaths. The incidents of still births were 2% and early neonatal deaths were 6% in the YM. The common neonatal morbidities in AM were admission to neonatal intensive care unit (NICU) (22%), preterm babies (18%), low birth-weight (LBW) (14%), congenital anomalies (10%), neonatal jaundice (6%), meconium aspiration, septicaemia (4% each) and Respiratory distress syndrome (RDS) (2%). The neonatal morbidities in YM were preterm babies (26%), LBW (20%), admission to NICU (14%), neonatal jaundice & septicaemia (10% each), meconium aspiration and RDS (2% each). The common congenital anomalies seen in babies born to AM were neural tube defect (6%), club foot (4%) and tracheoesophageal fistula (TEF) (2%). The occurrence of congenital anomalies in AM was a statistically significant finding ($p=0.0352$) (Table-1).

The Amniotic fluid index (AFI) measurements between 36-38 weeks gestation & placental weight in AM & YM have been illustrated in Table-2 & Table-3, respectively. The median duration of hospitalization of the AM and YM were 7 and 4 days, respectively. The range of duration of hospitalization in AM was 7-14 days.

DISCUSSION

The incidence of antenatal patients in AM was 19.3%. which reflects a high prevalence of early marriage in our society. Various literature had reported the incidence of pregnancy in elderly women ranging from 15-30%.¹⁻³ According to Williams textbook of obstetrics and gynecology, about 33% of pregnancies occur in women above 35 years.⁴ Seventy-eight percent of AM who delivered in our hospital belonged to 35-39 age group. The highest age was 42 years. In this study, the socio-economic condition was classified as low, lower middle, upper middle and high based on monthly income of (in Rs.) <1500, 1500-5000, 5000-10000, and

	≥35 years (n=50) (AM)		20-25 years (n=50) (YM)	
	No.	%	No.	%
AFI<5	9	18	5	10
AFI 5-20	36	72	42	84
AFI >20	5	10	3	6

Table-2: AFI measurements between 36-38 weeks gestation (n=50)

Placental weight	≥35 years (n=50) (AM)		20-25 years (n=50) (YM)	
	No.	%	No.	%
300-450g	8	16	3	6
450-550g	33	66	40	80
550-650g	9	18	7	14

Table-3: Placental Weight (n=50)

>10000, respectively. Using this classification, 26% of AM came from low socio-economic conditions in comparison to 56% of YM. Seventy-six percent of AM were working women whereas only 46% of YM were working. This observation was statistically significant ($p < 0.05$). This may reflect that in working women, late marriage and delayed childbearing were because of their professional demands. Higher education was more prevalent in AM as compared to YM. This higher education level also contributed to delayed childbearing in AM. Forty percent of AM were married for ≤ 2 years reflecting late marriage but no problems with conception. Those who were married for > 2 years, other factors like infertility may have contributed to the delay in conception. The fact that 84% of YM were married for 1-5 years, reflected high prevalence of early marriage in our society.

Sixty-four percent of AM were booked cases in comparison to 46% of YM. The unbooked cases in the AM were referred from peripheral hospitals due to their multiple complications to a tertiary care centre like our institution. The higher incidence of booked cases in case of AM was probably due to their better education and socio-economic status. Multiparity was common in AM versus the YM (66% vs 52%). But a significant proportion of AM (34%) were pregnant for the first time as compared to YM (48%). This indicates that in AM, the delay in childbearing was not only due to late marriage but also due to other factors causing infertility. In fact, 48% of AM had history of infertility which was a statistically significant finding. There were 21 primary and 3 secondary infertility cases. The current pregnancy resulted from infertility treatment in 11 cases. The incidence of infertility was only 12% in YM. Six percent of AM had vaginal delivery in the previous pregnancy as compared to 15.3% in the YM. C-section rate was 60% in AM and 11.5% in YM in their previous pregnancies. The AM had lower abortion rate (9%) as compared to YM. MTP rate was higher in YM. Stillbirth rate and early neonatal death was higher in YM. The commonest previous pregnancy complications in both groups was PIH. This shows that the previous pregnancy outcomes like spontaneous abortion and stillbirth also have a contributing factor for delayed childbearing in older women. The current obstetrical outcome revealed that elective LSCS was extremely common (84%) in AM. The major indications for LSCS were elderly gravida with associated obstetrical and medical complications followed by post C-section. In them 15% (5 cases) had emergency C-section and the most common indication was fetal distress. In the YM, the C-section rate was relatively much lower (30%) with most being emergency for intrapartum fetal distress. The major indication for elective C-section in them was CPD. Amongst the AM, only 3 had classical C-section. An indication of classical C-section was fetal distress in a 32 weeks premature baby of 39-year-old women with GDM with previous history of three intra-uterine deaths (IUD) and with no living issue. The high rate of C-section in elderly mothers was found in almost all previous studies. Martel et al reported that C-section rate in multiparous women increase from 13% in

those who were younger than 25 years old to nearly 28% for those aged 35 or older.⁵ It has been reported in literature that the primary C-section rate was 17% for women older than 35 compared with 10% in the women less than 25 years. The relative risk was increased by 1.3 in women older than 40 years compared with younger controls.^{6,7} Similar findings were reported in the other studies.^{8,9} Pregnant women aged 35-40 years were at increased risk of operation- vaginal delivery, elective and emergency C-section.¹⁰ Age and parity influenced the incidence of diabetes, labor disorders and C-section delivery.¹¹

In our study, during the current pregnancy 8% of AM and 10% of YM had threatened abortion for which they were hospitalized and treated conservatively. Early fetal wastage appears to increase as maternal age advances. Some concluded the spontaneous abortion rate increase in a consistent fashion with age so that there was twofold to fourfold increase when women reach their 40s.¹² The incidence of PIH was higher in YM. Three cases of eclampsia in AM and two cases in YM were seen. Studies have reported the incidence of pre-eclampsia to be 13% in previously non-hypertensive in their 40s compared with 10% in the general obstetrical population.^{7,13} The older women tended to have more severe pre-eclampsia than the younger women.⁵

The incidence of GDM in AM was higher (Table-1). In a study, the Los Angeles Country Women's hospital had performed 3 hours glucose tolerance screening in 652 conservative women attending prenatal clinic. They reported that 3.7% in women than younger than 20 years and 13.8% of women older than 30 years had abnormal results.¹⁴ While some had reported that older women with abnormal glucose tolerance tests had higher perinatal mortality rates, this finding was not substantiated by a later investigation of 261 class-A diabetic women.¹⁵ Many other studies had found similar findings.^{1,10,12,16} Oligohydramnios was taken in our study as ultrasonographical AFI of 5cm or less. The incidence has been illustrated in Table-2.

In our study, the incidence of placenta previa was more common in AM. We had two elderly patients of antepartum haemorrhage (APH) due to abruption placenta. A 3.2% incidence of placental abruption in women aged 40 or older compared with 0.4% for the general obstetrical population had been reported. The likelihood of placental accident was 1 in 100 after the age of 35 and 1 in 50 after the age of 40. Placental abruption was commonly associated with pregnancy induced hypertension.¹³ PPH was more common in YM. Six percent of AM required blood transfusion for the management of PPH whereas it was 10% in case of YM. However, it has been reported in a study that pregnant women aged 35-40 years were at increased risk of PPH.¹⁰ Preterm delivery is defined as delivery before 37 weeks of gestation. This was another complication which was also higher in AM. Many studies have reported higher rate of preterm delivery in women older than 40.^{5,10,16-18} Wound infection was also more common in AM. An Anaesthetic complication in the form of delay in reversal of general anaesthesia following C-section was seen in 3 patients

in AM. One required ventilatory support for five days in intensive care before gradual complete recovery.

We had 3 deaths in our study. The first was a 20-year-old primigravida who was referred from district hospital with severe PPH at 36 weeks gestation. She subsequently died due to excess blood loss. The second was a 22-year-old 3rd gravida at term with uncontrolled PIH and convulsion who died on the 2nd postoperative day following an emergency C-section. The third was a 20-year-old primigravida at 36 weeks with preeclampsia. She developed acute renal failure after emergency C-section and died on the 3rd postoperative day. Even though pregnancy in elderly women was accompanied by numerous complications, there was no mortality in AM. This may be probably due to the improvement in the health care as cited by Buehler.¹⁹ Their study on more than 5000 maternal deaths in USA, reported a fourfold increase in mortality for women aged 35-39 compared to women aged 20-24.

The rate of live births in our study was 94% & 98% for the AM & YM, respectively. The incidence of stillbirth & early neonatal death was 6% and 4% respectively in AM whereas it was 2% and 6% respectively in the YM. Even though pregnancy in AM was accompanied by many complications, meticulous antenatal and perinatal care has improved the fetal outcome in majority of the cases. Some studies reported that perinatal mortality rate increased with advancing maternal age and most occurred in those aged ≥ 40 years. This was due to excess stillborn rather than neonatal death in these older women.^{10,18}

Neonatal morbidity: LBW is defined as birth weight less than 2500 gm. Prematurity is defined as delivery before 32 completed weeks of gestation. LBW was 10% in YM.

However, many studies had concluded that the incidence of LBW infants and premature babies was directly proportional to the increasing age of the antenatal mothers.^{10,16-18,20} Meconium Aspiration which required gastric lavage seen in 1 baby born to AM and 3 babies born to YM. Septicemia was seen in 6% of newborns born to AM whereas the incidence was 13% in YM. RDS was seen in 4% and 11% of babies born to AM and YM, respectively. Five cases of neonatal jaundice which required phototherapy were seen in babies born to YM and another 7 such cases were seen in AM. Twenty-two percent & 14% of babies born to AM & YM respectively, required admission in NICU. A study reported a higher incidence of babies born to older mothers, required intensive care support.²¹

The incidence of congenital anomalies in our study was 12% which was exclusively seen in AM. This observation is statistically significant ($p=0.03$). The following congenital anomalies were seen in our study- neural tube defect (3 cases), TEF (1 case) & Clubfoot (2 cases). There was no incidence of chromosomal abnormalities such as Down's Syndrome. Antenatally we used maternal serum alpha fetoprotein (AFP) around 14 weeks and anomaly scan around 18-20 weeks in AM, to screen congenital anomalies. Serum maternal AFP was elevated in 5 cases with normal

ultrasound findings. We followed those pregnancies cautiously and subsequently none of the babies born to these mothers had congenital anomalies. But we have failed to detect TEF and clubfoot antenatally. Baby with TEF had low Apgar score at birth and subsequently developed feeding difficulty, investigations revealed TEF and died on the first day of life. The mothers with babies having neural tube defect were unbooked cases referred to our hospital as IUDs, all preterm. The ultrasound of first case revealed hydrocephalous, the second case revealed meningocele with spina bifida and the last case revealed meningomyelocele. All of them delivered macerated babies weighing 800 to 1200 gm. A study which reviewed birth certificate data from 29 states and they searched for 16 malformations that included spina bifida, cleft palate and syndactyly, reported that the association of age and congenital anomalies unrelated to morphological chromosomal aberrations, was not clear.²² It had been reported that the incidence of anomalies was doubled in women aged 40 or older compared with younger women. It should be emphasized that minor anomalies such as nevus and digital malformation were cited.⁷ The average of duration of hospitalization of AM and YM were almost similar. Increased incidence of long-term antepartum hospitalization for older mothers have been documented in literature.

CONCLUSION

The incidence of an adverse outcome is higher at the extremes of age during the reproductive years of a women. Present day surveys reveal that due to increasing education, career options and late marriages, many more women are now embarking on a pregnancy at a later age in life. However, for the normal weight, physically fit women without medical problems, the risk is much lower than previously acknowledged. Improved health care facilities, various antenatal investigations and active management have led to better pregnancy outcome in women older than 35 years. We can safely conclude that women should realistically appraise the risk of pregnancy later in life but not necessarily fear delaying childbirth. Pregnancy after 35 years is the fact of life in our society and better obstetrical care appears to have made advanced maternal age compatible with successful pregnancy for most of such women.

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