FOETOMATERNAL OUTCOME AMONG ELDERLY PREGNANT WOMEN ATTENDING A PERIPHERAL TEACHING INSTITUTION OF WEST BENGAL, INDIA- A PROSPECTIVE OBSERVATIONAL STUDY

Suman Ranjan Dutta[1], Debdulal Mandal[2], Anirban Mandal[3], Dibakar Haldar[4], Nita Ray[5], Debilina Roy[6]

[1]Specialist Medical Officer, Onda Superspeciality Hospital, Bankura, West Bengal.
[2]RMO-Cum-Cilinical Tutor, Department of Obstetrics and Gynaecology, Bankura Sammilani Medical College, Bankura, West Bengal.
[3]Assocaite Professor, Department of Obstetrics and Gynaecology, Bankura Sammilani Medical College, Bankura, West Bengal.
[4]Associate Professor, Department of Community Medicine, Bankura Sammilani Medical College, Bankura, West Bengal.
[5]RMO, Department of Obstetrics and Gynaecology, Diamond Harbour Government Medical College and Attached Hospital(S), Diamond Harbour, 24 Parganas(South), West Bengal.
[6]Consultant, Department of Obstetrics and Gynaecology, RK Mission, Sevashram, Kankhal, Hardwar, Uttarakhand.

ABSTRACT

BACKGROUND
Advances in assisted reproductive technology, delayed marriage and increase in the rate of divorce followed by re-marriage all lead to an increased number of women giving birth for the first time at the age of 35 years or more resulting in adverse maternal and foetal outcomes.
Aims and Objective- To estimate various foetomaternal outcomes and their influencing factors among women aged 35 years or more.

MATERIALS AND METHODS
A prospective observational study was conducted in the Department of Gynaecology and Obstetrics of Bankura Sammilani Medical College and Hospital, Bankura from April 2014 to March 2015 involving total 100 elderly primi as study group and another 100 pregnant women below the age of 35 years as comparison group, selected randomly. Data was collected at the time of inclusion, during follow up visit in antenatal clinic and in the labour room, as well as post-natal ward and special neonatal care unit during and after delivery. Interview, clinical examination including anthropometry and record review were used for data collection via a predesigned questionnaire.

RESULTS
Significantly higher proportion of maternal and foetal mortality and morbidity was found among the participants belonging to the study group. Antenatal and intranatal complications were all increased in study group. Only, 3% maternal deaths were observed among study group.

CONCLUSION
The fact 'delayed child bearing was associated with poor pregnancy outcome' was reaffirmed even in this setting. These pregnancies need quality antenatal, intranatal, post-natal and perinatal care using sophisticated techniques like amniocentesis, chorionic villus biopsy and early and more frequent ultrasonography etc.

KEYWORDS
Elderly Primi, Foetomaternal Outcome, Antenatal, Intranatal, Perinatal, Preeclampsia.

BACKGROUND
"When a child is born, there are two births; the birth of the child & the birth of the mother"- Laura Ramirez. The well-being of the society is directly linked to the health and survival of the mother and children.[1] Advances in assisted reproductive technology (ART), delayed marriage and increase in the rate of divorce followed by re-marriage, all contribute to this upward trend in age at first pregnancy leading to an increased number of women giving birth for the first time at the age of 35 years or more.[2]

The International Federation of Gynaecology & Obstetrics set the age limit of 35 in the year 1958. This age of 35 years have also been supported by other workers like Tuck et al.[3] In recent years, ART has challenged the traditional age-related boundaries of reproduction, enabling even postmenopausal women to conceive and give birth.[3] The reasons for the high rate of Caesarean section (CS) in older women include an increased prevalence of medical complications, fetal malposition, cephalopelvic disproportion (CPD), induction of labour, a failed trial of labour, and uterine rupture[4-9] Due to associated complication in old age, these patients are at greater risk of: postpartum thrombotic complications, Post-partum haemorrhage (PPH), fever & wound sepsis.[5] There is often difficulty in establishing breast feeding.[10] Common foetal-neonatal complications which are increased in elderly primigravidae are: low birth weight (LBW), congenital anomalies like Down syndrome, anencephaly, hydrocephalus and macrosomia. Incidence of LBW varies from 8.2% to 17%[11] Overall, perinatal morbidity and mortality is shown to

be increased in elderly women.[9] All these unfavourable outcomes of pregnancy at advanced age compelled the Obstetricians and health care manager to provide extra sophisticated care to this group of pregnant ladies. Keeping this in view, the present study was carried out in Bankura Sammilani Medical College and Hospital (BSMCH), one of the peripheral teaching institution situated in South-Western part of West Bengal catering a huge patient's load attending from the district Bankura itself and adjoining districts like Puruliya, Birbhum, Bardhaman as well as from the adjacent state Jharkhand. Most of these patients with nil or poor literacy level living in rural areas belonged to poor socioeconomic status (SES) and. Many of them had unfavourable awareness and practice towards contraceptive resulting in pregnancy at advance age.

The research hypothesis for this study was: advanced maternal age is associated with unfavourable foetomaternal outcome necessitating arrangement for extra care.

Aims and Objectives

1. To estimate various unfavourable pregnancy outcomes among the women, 35 years and above, of age.
2. To find out correlates of unfavourable pregnancy outcomes, if any.

MATERIALS AND METHODS

The present study was a prospective observational study conducted in the department of Gynaecology and Obstetrics (G&O), BSMCH, Bankura, West Bengal from April 2014 to March 2015 with prior permission from the 'Institutional Ethics Committee' and hospital authority after fulfilling all other requirements. Participants were selected randomly from antenatal (AN) clinic of G & O department and divided in to two groups i.e. study group comprising of pregnant women aged 35 years and above & comparison group containing pregnant women of <35 years of age. One hundred pregnant women of 35 years & above and 100 pregnant women of <35 years selected based on a formula,

$$ n = \frac{[Z_\alpha 2\sqrt{\overline{pq}} + Z_\beta \sqrt{(p_0 q_0 + p_1 q_1)}]^2}{(p_1 - p_0)^2}, $$

where Z_α=1.96 (two tailed) at 95% confidence interval with 5% precision, Z_β= 0.84 for 80% power of test, p_0 & p_1=incidence (s) of event of interest e. g. proportion of newborns requires care in special newborn care unit (SNCU) in study & control group, q_0 & q_1=complements of p_0 & p_1=100-p_0 & 100-p_1, $\overline{p}$=(p_0+p_1)/2 and $\overline{q}$=100-$\overline{p}$. Subjects belonged to the study and comparison groups were selected @ 1:1 basis. Here, p_0 & p_1 were considered to be 1.93% and 13.33%, respectively as per the existing literature.[12] Estimated sample size was revised assuming 20% drop out and finally, it became 100 for each group.

Data collection was done via twice a week 'Schedule sampling' e. g. either Monday-Thursday or Tuesday-Friday or Wednesday-Saturday for a period of 17 weeks. The pair of the days was selected randomly for each week of data collection. As per record 5-6 elderly pregnant women out of total 100 new attendance visited per day in the AN clinic, G & O. Daily three participants for each group were selected via systematic random sampling followed on each day of data of collection i.e. starting unbiasedly following simple random

sampling every alternate participant for elderly group and every 30th for the <35 years age group was selected for the purpose of study. As it was a prospective study involving two dynamic cohorts i.e. study cohort and comparison (Control) cohort, the participants were selected in such a way that the pregnancy outcome of last participant of both the groups could occur within the study period. They were included minimum 6 months before their expected date of delivery (EDD) as the AN booking is done usually within 1st trimester.

Only those who were willing to attend for follow up as per physicians' instruction and had A N booking within 1st trimester were included in the study at their first visit in the A N clinic, BSMCH. Baseline data were collected at the time of inclusion in the study via interview using a predesigned and pretested interviewer administered questionnaire after obtaining informed consent of each participants. Data related to progress of the pregnancy, compliance to A N services and advices, pregnancy complications etc. were collected prospectively in follow up A N visits via detailed history taking (interview) and clinical examinations including anthropometry. Information about outcome(s) of pregnancy was collected from labour room as well as post-natal ward and SNCU through interview, observation as well as clinical examination including anthropometry.

Collected data were gathered in micro-soft (MS) excel spread sheet and analysed using SPSS software, version 20.0. Data were described by parameters e.g. mean and standard deviation (SD) for continuous variables and proportion for categorical variables. Displaying of data was done by tables. The inference regarding the relationship between the variables was drawn based on the statistical tests like Chi-square (χ2)/Fisher exact test, Relative risk (RR) and Odds ratio (OR) with their 95% confidence interval (CI). P value of ≤0.05 was considered to be significant with 95% confidence interval (CI) at 5% precision.

RESULTS

The participants of both the groups were comparable in respect of their religion, SES, overall nutritional status. [Table-1] Higher proportion of cases with history of primary infertility was observed in study group but no statistically significant difference could be revealed to exist in contrast to comparison group. Multiparity was found significantly more in study group.

Average gestational age in the study group was 35 ± 8.04 (Mean±SD) and in comparison group, it was 37.06 ± 5.80 years. The difference was revealed to be significant (unpaired t=2.08 at df 198, p<0.05).

It was observed that 40%, 56.66%, 1.1% and 2.2% women of the study group were delivered by normal vaginal delivery, CS, forceps delivery and assisted breech delivery, respectively with respective figures of 55.2%, 40.62%, 2% and 2% in comparison group. Rate of delivery by CS was high in both the groups but it was significantly more among the participants of study group compared to their counterpart. Operative vaginal delivery was comparatively less.

Overall, medical complications were found more in study group in contrast to comparison group (48% vs 26%) and the difference was statistically significant (χ2=10.38 with p=0.001 at df 1).

Regarding associated individual medical complications, a statistically significant higher proportion of participants in the study group was revealed to have preeclampsia (p=0.035), anaemia (p=0.014) and other overall associated medical complications (p=0.051) like hypothyroidism, gall bladder stone, fever, thalassaemia, asthma, epilepsy, jaundice etc.

However, no such between group difference was found in this study regarding pregnancy induced hypertension (PIH) [p=0.228], eclampsia (p=1.00), heart disease (p=0.081) or gestational diabetes mellitus (GDM) [p=0.497].

The present study showed overall obstetric complications of 76% in the study group and 54% in comparison group with statistical significant (χ^2=10.64 at df 1 with p=0.001) difference.

Among all the obstetric complications, intrauterine growth retardation (IUGR) [p=0.00016], scanty liquor (p-0.018), post CS pregnancy (p=0.0079) and premature rupture of membrane (PROM) [p=0.014] were found to have statistically significant difference across the groups.

But no such statistically robust difference could be found among study and comparison groups in regard to post-dated pregnancy (p=0.476), preterm labour (p=0.144), foetal distress (p=1.0), malpresentation (p=1.0), non-progress of labour (p=0.721), intrauterine foetal death (IUFD) [p=1.0] and ante-partum haemorrhage (APH) [p=0.128].

Incidence of twin pregnancies (p=0.516), miscarriages (p=0.194) and ectopic pregnancies (p=1.0) were also found more in study group, but there was no statistically significant between group differences. [Table-2]

Variables	Attributes	Study group [n1=100] No. (%)	Control group[n2=100] No. (%)	χ^2 at df 1, P	OR (95% CI)
Religion	Hindu	88 (48.89)	92 (51.11)	0.889, 0.346	0.64 (0.23-1.78)
	Muslim	12 (6.0)	8 (4.0)		
SES	Average	57 (54.28)	48 (45.71)	1.624, 0.202	1.44 (0.79-2.61)
	Poor	43(45.26)	52 (54.73)		
Nutritional status	Good	24 (37.50)	35/40 (62.50)	2.91, 0.88	0.59 (0.30-1.13)
	Average or poor	76 (55.88)	65/60 (44.11)		
BMI†	Normal (18.5-24.9)	62 (46.61)	71 (53.38)	1.818, 0.177	0.67 (0.35-1.25)
	Under/over weight	38(56.71)	29 (43.28)		
Gravidity	Primi	22 (30.55)	50 (69.44)	17.02, 0.0001	0.28 (0.15-0.54)
	Multi	78 (60.93)	50 (39.06)		
History of Infertility	Present	6 (85.71)	1 (14.28)	3.701, 0.054	6.32 (0.73-41.91)
	Absent	94 (48.70)	99 (51.29)		

Table 1. Distribution of participants as per socio-demographics and other attributes (N=200)

†BMI=Body mass index.

Variables	Attributes	Groups		χ^2 at df 1, p	RR (95% CI)
		Study No. (%)	Comparison No. (%)		
No. of foetus [n1=91, n2=96]	Single tone	85 (48.02)	92 (51.97)	0.54, 0.461	0.80 (0.47-1.36)
	Multiple	6 (60.0)	4 (40.0)		
Gestational age at termination [n1=n2=100]	Term	67 (44.96)	82 (55.03)	5.921, 0.014	0.69 (0.53-0.91)
	Preterm	33 (64.70)	18 (35.29)		
Miscarriages [n1=n2=100]	Present	7 (70.0)	3 (30.0)	1.68, 0.194	1.43 (0.93-2.20)
	Absent	93 (48.68)	97 (51.32)		
Ectopic pregnancy [n1=n2=100]	Present	2 (66.66)	1 (33.33)	1.00*	1.34 (0.59-3.02)
	Absent	98 (49.74)	99 (50.25		
Mode of delivery [n1=91, n2=96]	Vaginal	40 (41.24)	57 (58.76)	4.357, 0.035	0.73 (0.54-0.98)
	CS	51 (56.7)	39 (43.3)		
Duration of labour [1=40, n2=57]	<12 hrs	26 (46.42)	30 (53.57)	1.473, 0.224	1.36 (0.82-2.26)
	≥12 hrs	14 (34.14)	27 (65.85)		
Induction/ Augmentation [n1=81, n2=88]	Given	12 (21.42)	44 (78.57)	23.57, 0.000	0.35 (0.21-0.59)
	Not given	69 (61.06)	44(38.94)		

Table 2. Distribution of participants according to their antenatal and intranatal attributes (N=200)

*p for Fisher exact test (Two tallied).

Regarding the indications of CS, significant differences existed between the groups in respect to PROM, preterm labour, post CS, IUGR, scanty liquor and hypertensive disorders in pregnancy. Among these, hypertensive disorders (31.37%), post CS (27.45%), post-dated pregnancy (27.45%) and IUGR (25.49%) ranked on the top.

Increased incidence of different postpartum complications like PPH, retained placenta, eclampsia, ruptured uterus and subtotal hysterectomy, shock, fever and postpartum maternal death was observed in elderly mothers. Among all of these complications, PPH had significantly higher incidence among elderly pregnant mothers (20% vs 4%, p=0.001) and it had concurrence other studies. Overall complication rates were significantly higher in the study

group (p=0.051). Subtotal hysterectomy had to be done in one case in the study group.

Present study revealed increased incidence of LBW babies among study group compared to the comparison group (40.20 % vs 24%) leaving the difference significant (p=0.014). It might partly be considered as the impact of low gestational age among women belonged to study group on foetal birth weight.

Analysis reflected that the still birth rate in study group was 7.21% versus 3% in comparison group (p=0.172), severely asphyxiated babies (Apgar score at 5 minute=0-3) was 10.30% in study subjects compared to 4% in comparison group. These differences across the groups weren't statistically robust.

Regarding extra special care to the newborn, it was found that 26% of babies in study group versus 20% of comparison group had admission in SNCU for different reasons among which perinatal asphyxia was most common. The groups didn't differ in regard to the admission in SNCU (p=0.388). Among those admitted in SNCU 6.18% and 3.0% died in study and comparison group, respectively, however, leaving no statistically significant difference in between (p=0.284). Analysis revealed 3.61% and 1.0% newborns with congenital malformation among the study and comparison group, respectively but this difference wasn't established to be statistically significant (p=0.297).

Although majority of the parameters of perinatal outcomes did not give significant results in terms of p values, their incidence was found clearly higher in study group compared to that of the comparison group. Three maternal deaths occurred in the study group caused by-cardio-vascular accident (CVA), sudden respiratory distress and congestive cardiac failure (CCF) in a severely anaemic with rheumatic heart disease (RHD) compared to no death in comparison group and the difference was insignificant.

DISCUSSION

Age of the pregnant mother has great impact on foetomaternal outcome(s). Very low age group of conceiving, as well as elderly group, both have deleterious effects on antenatal, intranatal and postnatal period as well as on perinatal outcome and it always remains a challenge to the obstetrician to get rid of the complications arises out of the older age group. In this study 35 years was considered as a cut off value for the purpose of international comparison.

Multiparity was found significantly more in study group. As it is an established fact that pregnancy complication was more for primiparous women. Here, the proportion of primiparous was more in the control group expecting its confounding effects on the elderly pregnant women would be low. A study conducted by Pattnaik L et al.[12] also involved 16% primiparous and 84% multiparous in the study group whereas 50.19% primiparous and 49.81% multiparous in control group. It might partly be due the lacuna in implementation of family planning programme.

CS delivery was revealed to be higher in advanced age group which had concurrence with observation made by Katwijk C V et al. in their review that the older gravida also has a higher chance of being delivered by CS.[13]

The present study didn't reveal any significant difference between the groups in regard to PIH, eclampsia but preeclampsia contrary to the findings of Pattnaik L et al.[12]

Liux et al[14] and Khalewad P S et al.[15] who reported higher incidence of hypertensive disorders was lower.

This study reported no significant higher incidence of GDM among the mothers belonging to advanced age group. It is not in concurrence with what was found in the study carried out by Pattnaik L et al.[12] as well as Lamminpaa R et al.[16] It also agrees with the study of Carolon M et el.[17]

Analysis of this study revealed an increased incidence of hypothyroidism in advanced age mothers consistent with the observation made by Pattnaik L et al.[12] The possible reason might be an increased incidence of autoimmune thyroiditis with advanced age. However, Pandit S et al. observed no such trend.[18]

Oligohydramnios was present in significantly higher proportion of advanced age women as was also reported by Pattnaik L et al.[12] Khalewad P S et al.[15] in 2016 and Antsaklis A et al. in January 2013.[19] However, contrary to the findings of Pattnaik L et al.[12], malpresentation wasn't found more among the elderly group of pregnant women.

Pattnaik L et al.[12] reported no difference between groups in gestational age at delivery, but this study revealed significant difference in gestational age at termination of pregnancy irrespective of foetal viability.

There was no statistically robust difference in APGAR scores across the groups, but there was an increased incidence of IUGR babies in the study group, which is similar to those reported by Pattnaik L et al., Khalewad P S et al., Li-Chun Liu et al. and Odibo A O et al.[12,15,20,21]

Contrary to the findings of this study, an increased number of SNCU admissions in older women was observed by Pattnaik L et al., Bahtiyar M O et al., Jacobson B et al. and particularly a large study done by I-Jan Hu.[12,22-24]

The present study revealed no difference between groups in regard to still birth rate, however, as reported by Pattnaik L et al.[12] and by a large study done by I Jan Hu et al.[24], the still birth percentage was significantly higher in the older women due to increased incidence of medical and obstetrical conditions complicating the pregnancy.

CONCLUSION

Delayed child bearing is associated with increased risk of poor pregnancy outcome. It may demand extra inputs in the form of special A N care like amniocentesis, chorionic villus biopsy and early and more frequent ultrasonography. Labour should preferable be conducted in a well-equipped institution where skilled obstetrician, anaesthesiologist, neonatologist are available. No doubt, advances in prenatal diagnosis, early detection and management of pregnancy complications, antenatal and intranatal foetal monitoring and modern perinatology have reduced the problems associated with advanced maternal age. Now, healthy elderly women who receive appropriate pre-pregnancy counselling and up to date perinatal care can achieve results comparable to those achieved by younger women. But in a resource poor country like India the role of prevention of delayed pregnancy, especially in multigravida via effective implementation of family welfare programme may not be overemphasized.

REFERENCES

[1]   Coope MA, Fraser DM. Myles text book for Midwives. 14th edn. China: Churchill Livingstone 2003.

[2]   Hansen JP. Older maternal age and pregnancy outcome: a review of the literature. Obstet Gynecol Surv 1986;41(11):726-42.

[3]   Tuck SM, Yudkin PL, Turnbull AC. Pregnancy outcome in elderly primigravidae with and without a history of infertility. BJOG 1988;95(3):230-7.

[4]   Callaway LK, Lust K, McIntyre HD. Pregnancy outcomes in women of very advanced maternal age. Aust N Z J Obstet Gynaecol 2005;45(1):12-6.

[5]   Lin HC, Xirasagar S. Maternal age and the likelihood of a maternal request for caesarean delivery: a 5-year population-based study. Am J Obstet Gynecol 2005;192(3):848-55.

[6]   Main DM, Main EK, Moore DH. The relationship between maternal age and uterine dysfunction: a continuous effect throughout reproductive life. Am J Obstet Gynecol 2000;182(6):1312-20.

[7]   Smith GC, Cordeaux Y, White IR, et al. The effect of delaying childbirth on primary Caesarean section rates. PLoS Med 2008;5(7):e144.

[8]   Greenberg MB, Cheng YW, Sullivan M, et al. Does length of labor vary by maternal age? Am J Obstet Gynecol 2007;197(4):428.e1-7.

[9]   Bujold E, Hammoud AO, Hendler I, et al. Trial of labor in patients with a previous caesarean section: Does maternal age influence the outcome? Am J Obstet Gynecol 2004;190(4):1113-8.

[10]   Edmonds DK. Dewhurst's textbook of obstetrics & gynaecology. 8th edn. John Wiley and Sons, Ltd., Publication 2012.

[11]   Prysak M, Lorenz RP, Kisly A. Pregnancy outcome in nulliparous women 35 years and older. Obstet Gynecol 1995;85(1):65-70.

[12]   Pattnaik L, Das A, Avasthi A. Advanced maternal age & adverse fetomaternal outcome: a retrospective study. International Journal of Science and Research (IJSR) 2017;6(9):1475-8.

[13]   Van Katwijk C, Peeters LL. Clinical aspects of pregnancy after the age of 35 years: a review of the literature. Human Reproduction Update 1998;4(2):185-94.

[14]   Liux X, Ruan Y, Zhang W. Relationship between maternal age and hypertensive disorder of pregnancy. Zhonghua Yi Xue Za Zhi 2015;95(1):19-22.

[15]   Kalewad PS, Nadkarni T. The perinatal and maternal outcome in pregnancy with advanced maternal age 35 years and >35 years. Int J Reprod Contracept Obstet Gynecol 2016;5(6):1929-35.

[16]   Lamminpää R, Vehviläinen-Julkunen K, Gissler M, et al. Pregnancy outcomes in women aged 35 years or older with gestational diabetes - a registry-based study in Finland. The Journal of Maternal-Fetal & Neonatal Medicine 2016;29(1):55-9. DOI: 10.3109/14767058.2014.986450

[17]   Carolan M, Davey MA, Biro MA, et al. Maternal age, ethnicity and gestational diabetes mellitus. Midwifery 2012;28(6):778-83.

[18]   Pandit S, Kale D. Obstetric outcome in elderly primigravida... How did they fare? Bombay Hospital Journal 2011;53(4):715-20.

[19]   Antsaklis A, Veachos D, Pergialiotis V. The advanced maternal age primigravida: a case control study in a tertiary centre. Arch of Perinatal Medicine 2013;19(1):50-4.

[20]   Liu LC, Wang YC, Yu MH, et al. Major risk factors for stillbirth in different trimesters of pregnancy--a systematic review. Taiwan J Obstet Gynecol 2014;53(2):141-5. doi: 10.1016/j.tjog.2014.04.003.

[21]   Odibo AO, Nelson D, Stamilio DM, et al. Advanced maternal age is an independent risk factor for intrauterine growth restriction. American J Perinatol 2006;23(5):325-8.

[22]   Bahtiyar MO, Funai EF, Rosenberg V, et al. Stillbirth at term in women of advanced maternal age in the United States: when could the antenatal testing be initiated? Am J Perinatol 2008;25(5):301-4. doi: 10.1055/s-2008-1076605.

[23]   Jacobson B, Ladfors L, Milsom I. Advanced maternal age and adverse perinatal outcome. Obstet Gynecol 2004;104(4):727-33.

[24]   Hu IJ, Chen PC, Jeng SF, et al. A nationwide survey of risk factors for stillbirth in Taiwan, 2001-2004. J of Pediatrics & Neonatology 2012;53(2):105-11.