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Study of Obstetric Outcome in Primiparous Women in Different Age Groups in our Population

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Abstract: ***Objectives: To evaluate the associations between maternal age and obstetric outcome in primiparous women with emphasis on teenagers and older women. Design: A prospective observational study. Setting: Gauhati Medical College and Hospital. Materials and methods: A prospective observational study was performed over a period of one year. Primiparous women with singleton births from July 2015 to June 2016 (N=500) were divided into five age groups, 17–19 years and an additional four 5-year clusters. The reference group consisted of the women aged 25–29 years. Groups were compared for obstetric outcome. Primary outcome: Obstetric outcome. Results: The teenager groups had significantly more vaginal births [OR 1.8 (0.9 to 3.2) for 17–19 year]; fewer caesarean sections [OR 0.6 (0.3 to 1.1)], and instrumental vaginal births [OR 0.6 (0.06 to 5.8] compared with the reference group. The opposite was found among older women reaching a fourfold increased OR for caesarean section. The teenagers showed no increased risk of adverse neonatal outcome but presented an increased risk of preeclampsia and eclampsia [OR 1.66 (1.10 to 2.51) and 1.20 (1.04 to 1.38)]. Women with advancing age (≥30 years) revealed significantly increased risk of abruption, placenta previa, and postpartum haemorrhage compared with the reference group.***

Keywords: Primiparous pregnancy, obstetric outcome

1. Introduction

Childbirth is one of the most awaited and cherished events in the life of a woman wherein she steps into a world of creation i.e. motherhood. The physiological transition from being pregnant to becoming a mother is an enormous emotional and physiological accomplishment for the women and her family. Labour is an enigma and complications may arise at any stage that may threaten the life of mother and the fetus.

Young mothers have been shown to be exposed to an increased risk of anaemia, low birth weight, fetal death, eclampsia and preterm birth although, at the same time, they were more likely to have a spontaneous normal vaginal birth and the risk of preeclampsia and postpartum haemorrhage (PPH) were significantly decreased [1]

Complications during pregnancy and birth at an advanced maternal age (either defined as 35 years and older or 40 years or older) have also been evaluated in high-income countries. Advanced maternal age at birth has been found to be associated with gestational diabetes, preeclampsia, placenta previa, caesarean section (CS), placental abruption, preterm delivery, low birth weight, intrauterine fetal death and increased perinatal mortality [2]. India has, during several decades, actively developed strategies in social care, education and healthcare in order to improve antenatal care and parenthood. Consequently, there is a constant need for evaluation both of single diagnostic procedures and intervention and of outcomes. The objective of the current study is to assess the impact of maternal age on obstetric outcome among singleton primiparous women in Gauhati Medical College with special emphasis on adolescents and older mothers.

2. Materials and methods

This is a prospective observational study which analyses the obstetric outcome of all singleton primiparous women prospectively registered in the Gauhati Medical College and hospital who gave births from 1st July 2015 to 30th June 2016. Starting with the first antenatal visit, usually in gestational weeks 10–12, the information is collected prospectively in standardised medical record forms completed at antenatal care visits and the birth units. The study population was grouped according to maternal age into five subgroups: 17–19, 20–24, 25–29, 30–34 & ≥35years. In the outcome analyses we selected the group of women aged 25–29 years as reference group. The obstetric outcome variables studied included gestational age, mode of delivery, perineal laceration, preeclampsia, eclampsia, abruption placenta, placenta praevia, PPH etc.

3. Results

In the period July 2015–June 2016, 500 numbers of primiparous women giving birth at Guwahati Medical College and Hospital were studied. The obstetric data subdivided into maternal age groups are presented in the form of tables and figures.

Table 1: Distribution of Cases According to Age

Age in years	Total no of cases	Percentage
17 -19	71	14.2%
20-24	248	49.6%
25-29	129	25.8%
30-34	39	7.8%
≥35	13	2.6%
Total	500	100%

As shown in table 1, out of 500 primiparous cases, age group of 20-24 is 49.6% and that of 25-29 is 25.6%. This is true as the optimal age group in India is between 20 and 30 years. Teenagers constitute 14.2%, age group 30-34 years constitute 7.8% while elderly primipara constitute only 2.6 %.

Table 2: Gestational age (in weeks) in the study population

Gestational age in weeks	Age in years									
	17 to 19	%	20 to 24	%	25 to 29	%	30 to 34	%	≥ 35	%
< 32	2	3	9	4	2	1	1	3	0	0
32 – 36	10	14	36	14	11	8	8	20	3	23
37 – 41	38	53	146	59	89	70	21	54	10	77
≥ 42	21	30	57	23	27	21	9	23	0	0
Total number	71		248		129		39		13	

From table 2 , it is seen that majority of preterm births occurred in the age group of ≥35 years (23%) between 32-36 weeks while there is no case of delivery <32 weeks among the elderly. Most of the post term pregnancy occurred in the age group of 17 -19 years (30%). Term pregnancy was highest for the elderly age group >35 years i.e. 77%. Most of the teenagers (53%) delivered at 37-41 weeks of gestation. Only 3% (<32 weeks) and 14% (32-36 weeks) of preterm deliveries are seen in teenagers in this study. 30% of teenagers delivered after 42 weeks. Most of the delivery between 25-34 years occurred at 37-41 weeks of gestation (70% for 25-29 years and 54% for 30-34 years of age). Elderly primiparas >35 years had no preterm (<32 weeks) or post-term births in our study. Most of the deliveries in the age group of 20-24 years occurred between 37-42 weeks of gestation (59%).

Table 3: Onset of labour

Onset of labour	Age in years									
	17 to 19	%	20 to 24	%	25 to 29	%	30 to 34	%	≥ 35	%
Spontaneous	63	88.7	219	88.3	112	86.8	38	97.4	8	61.5
Induced	8	11.3	29	11.7	17	13.2	1	2.6	5	38.5

From the above table it is seen that most of the spontaneous delivery occurred in the age group of 19-34 years. Patients belonging to the age group of 30-34 years showed the highest incidence of spontaneous delivery (99.4%) while elderly age group ≥35 years had only 61.5 % spontaneous births. Percentage of spontaneous births in teenagers, 20-24 years and 25-29 years are 88.7%, 88.3% and 86.8 % respectively. Patients above 35 years were mainly induced (38.5%). Age group between 30-34 years are the least induced (2.6%). Only 11.3 % of teenagers were induced while patients in the age groups of 20-24 years and 25-29 years had 11.7 % and 13.2 % induced onset of labour. Patients between 30-34 years of age have the lowest incidence of induced labour (2.6 %).

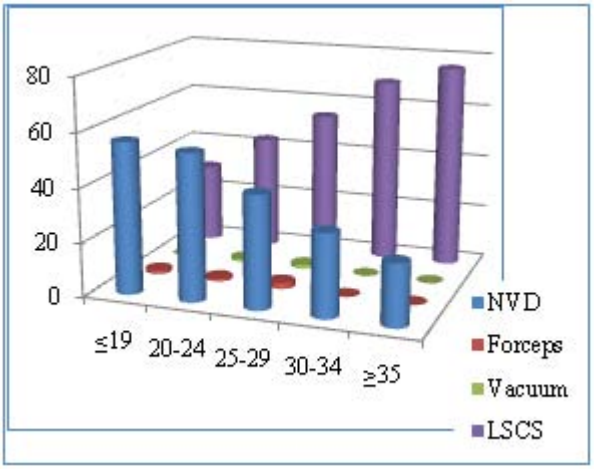

Figure 1: Showing Mode of delivery in different age groups

NVD-normal vaginal delivery; LSCS-Lower segment caesarean section

Table 4: odds ratio of mode of delivery

Mode of delivery	Age in years							
	17 – 19		20 – 24		30 – 34		≥ 35	
	Crude OR (95%CI)	P value	Crude OR (95%CI)	P value	Crude OR (95%CI)	P value	Crude OR (95%CI)	P value
Normal vaginal delivery	1.8 (0.9 -3.2)	0.05	1.6(1.07-2.55)	0.02	0.6(0.28-1.32)	0.2	0.4(0.10-1.58)	0.19
Forceps	0.60(0.06-5.8)	0.6	0.51(0.10-2.58)	0.4	0.4(0.02-9.04)	0.6	1.3(0.06-27.3)	0.8
Vacuum	0.3(0.01-7.5)	0.5	0.7(0.12-4.71)	0.7	0.64(0.03-13.7)	0.7	1.8(0.08-41.42)	0.6
LSCS	0.6(0.34-1.1)	0.1	0.6(0.41-0.98)	0.04	1.8(0.88-4.06)	0.1	2.8(0.7-10.6)	0.12

The odds ratio for normal vaginal delivery are 1.8 (17-19 years), 1.6 (20-24years), 0.6 (30-34 years) and 0.4 (≥35 years). P value of normal vaginal delivery is statistically not significant in all the age groups (p value >0.05). The odds ratio of forceps delivery in teenagers and elderly >35 years are 0.60 and 1.3 respectively. The odds ratio for LSCS is highest in the age group of ≥35 years (2.8) and is the least in the teenager group. None of the findings are statistically significant (p value >0.05).

Table 5: Maternal complications

Maternal complications	Age in years									
	17 – 19	%	20 – 24	%	25 – 29	%	30 – 34	%	≥ 35	%
PPH	0	0	2	0.8	0	0	0	0	0	0
Preclampsia	2	10.5	7	2.8	3	2.3	4	10.2	1	7.6
Eclampsia	4	5.6	6	2.4	2	1.5	1	2.5	0	0
Placenta previa	0	0	1	0.4	1	0.7	1	2.5	1	7.6
Abruption	0	0	0	0	0	0	1	2.5	0	0
Obstructive labour	0	0	4	1.6	0	0	0	0	0	0
Jaundice	0	0	1	0.4	0	0	0	0	0	0
Prolonged labour	0	0	5	2.01	5	3.8	7	17.9	0	0

From the above table (table 5) it is seen that most of the patients who developed preeclampsia (10.5%) and eclampsia (5.6%) belonged to teenage group. The lowest incidence of preeclampsia is seen in the age group 20-24 years (2.8%). However there is no case of eclampsia recorded in ≥35 years. PPH is seen only in the age group of 20-24 years (0.8%). 4 cases of placenta praevia is seen in the age group of ≥20 years, the highest being in the age group ≥35 years (7.6%). However there is no case of placenta praevia in teenagers. There is only one case of abruption in the age group of 30-34 years (2.5%). Only one case each of obstructive labour and jaundice are seen in the age group of 20-24 years (1.6% and 0.4 % respectively). Prolonged labour is highest in the age group of 30-34 years (17.9%). There is no case of prolonged labour in the teenager group. Overall the age group 30-34 years showed so many complications-PPH (10.2%), eclampsia (2.5%), placenta praevia (2.5%), abruption (2.5%) and prolonged labour (17.9%).

Mode of delivery and obstetric outcome of teenagers

Compared with the reference group, the teenagers had a significantly higher likelihood of having spontaneous onset of labour and of having a normal vaginal delivery. The incidence of teenage pregnancy is only 14.2% in the present study. Of these 17% had preterm delivery which is less compared to other age groups in the current study. Compared with the reference group (25-29 years), the teenagers had a significantly higher likelihood of having spontaneous onset of labour and of having a normal vaginal delivery. Out of 71 cases in the age group of ≤19 years, majority delivered by normal vaginal delivery (56.3%) while 1.4% delivered by outlet forceps application and 42.3% underwent LSCS. Among those who were induced, it was only 11.3 % in <19 years and 13.2% in the reference age group. In this study, the teenagers have the highest incidence of normal vaginal delivery (56.3%) while the elderly have the highest incidence of caesarean delivery (76%). Instrumental delivery is highest in the reference group i.e. 25-29 years (2.3% for forceps and 1.5% for vacuum). Labour was induced by giving prostaglandin E2gel or E1 tablet. Preclampsia and eclampsia are highest in the teenagers (10.5% and 5.6% respectively). No cases of prolonged labour or placenta praevia are seen in teenage age group.

Table 6: odds ratio of maternal complications

Maternal complications	Age in years							
	17 – 19		20 – 24		30 – 34		≥ 35	
	Crude OR (95%CI)	P value	Crude OR (95%CI)	P value	Crude OR (95%CI)	P value	Crude OR (95%CI)	P value
PPH	1.8(0.035-92.2)	0.7	2.62(0.12-55.12)	0.53	3.27(0.06-167.9)	0.55	9.59(0.18-508.14)	0.26
Preclampsia	1.21(0.19-7.46)	0.83	1.21(0.31-4.79)	0.77	4.80(1.025-22.4)	0.04	3.50(0.33-36.31)	0.29
Eclampsia	3.79(0.67-21.23)	0.12	1.57(0.31-7.91)	0.58	1.67(0.14-18.93)	0.67	1.88(0.08-41.42)	0.68
Placenta previa	0.59(0.02-14.89)	0.75	0.51(0.01-8.35)	0.64	3.36(0.20-55.13)	0.39	10.66(0.62-181.53)	0.10
Abruption	1.81(0.03-92.25)	0.76	0.52(0.01-26.41)	0.74	10.09(0.40-252.76)	0.15	9.59(0.18-508.14)	0.26
Obstructive labour	1.81(0.035-92.25)	0.76	4.76(0.25-89.23)	0.29	3.27(0.06-167.92)	0.55	9.59(0.18-508.14)	0.26
Jaundice	1.81(0.035-92.25)	0.76	1.56(0.06-38.80)	0.78	3.27(0.06-167.92)	0.55	9.59(0.18-508.14)	0.26
Prolonged labour	0.15(0.008-2.90)	0.21	0.51(0.14-1.79)	0.29	5.42(1.6-18.22)	0.0062	0.83(0.04-16)	0.90

Mode of delivery and obstetric outcome of women aged 20–24 years

The young women, 20–24 years of age, differed in some aspects from the reference group as well as from the adolescents. The obstetric and neonatal outcomes were similarly as favourable as those observed for the adolescents in comparison with the reference group. In our study it is observed that most of the women belong to the age group of 20-24 years (49.6 %). Very preterm delivery <32 weeks is more common in 20-24 years of age (4%). Most of the deliveries in the age group of 20-24 years occurred between 37-42 weeks of gestation (59%). Spontaneous births accounted for 88.3% (OR 1, 14).Only 11.7% had induced labour (OR 0.8). In the age group of 20-24 years, majority had normal vaginal delivery (54.4%, OR-1.6) while 1.2% is delivered by forceps, 1.2 % by vacuum and 43.1 % delivered by LSCS. The lowest incidence of preeclampsia is seen in the age group 20-24 years (2.8%). PPH is seen only in the age group of 20-24 years (0.8%). Only one case each of obstructive labour and jaundice are seen in the age group of 20-24 years (1.6% and 0.4% respectively).

Mode of delivery and obstetric outcome of women older than 29 years of age

Compared with the reference group almost all obstetric outcome variables demonstrated a continuously progressive deterioration with increasing age. The likelihood of normal vaginal births decreased; induced labour and caesarean

section (CS) increased. The likelihood of pregnancy complications such as placenta previa was high. The incidence of patients between 30-34 years is 7.8% and elderly ≥35 years are 2.6%. It is seen that majority of preterm births occurred in the age group of ≥ 35 years(23.07%; OR 2.7) between 32-36 weeks while there is no case of delivery <32 weeks among the elderly. Term pregnancy was highest for the elderly age group >35 years i.e. 77% (OR-3.8). Elderly primiparas >35 years had no preterm (<32 weeks) or post-term births in our study. The p values of births at 32-36 weeks and 37-41 weeks for the elderly >35 years are 0.04 and 0.04 which are statistically significant. Patients belonging to the age group of 30-34 years showed the highest incidence of spontaneous onset of labour (99.4%) while elderly age group ≥35 years had only 61.5% spontaneous labour (86.8% in the reference group). Patients above 35 years were mainly induced (38.5%).Age group between 30-34 years are the least induced (2.6%). A patient between 30-34 years of age group has the lowest incidence of induced labour (2.6 %).

The p values of the mode of onset of labour for the patients above 35 years (both spontaneous and induced) are <0.05 which is statistically significant. The findings in other age groups are not statistically significant (p value >0.05).The odds ratio (OR) of spontaneous and induced labour in patients ≥35years are 0.24 and 4.11 respectively. The highest incidence of LSCS is seen in the age group of >35 years (76%; OR 2.8). There is no delivery by forceps application and vacuum extraction in the age group ≥30 years. There is no case of eclampsia recorded in ≥35 years. There is only one case of abruption in the age group of 30-34 years (2.5%). Prolonged labour is highest in the age group of 30-34 years (17.9%). However there is no case of prolonged labour in ≥35 years. Overall the age group 30-34 years showed so many complications-PPH (10.2%), eclampsia (2.5%), placenta praevia (2.5%), abruption (2.5%) and prolonged labour (17.9%). Most of the caeserian done in our study was emergency LSCS. Majority were done for fetal distress (41.02%); highest in the age group ≥30 years (41.02% between 30-34 years and 30.8 % in patients above 35 years). Prolonged labour which is also highest in the age group of 30-34 years (17.9%). Majority of the LSCS done for placenta praevia is seen in the elderly age group ≥35 years (7.7%). Highest number of LSCS done for breech presentation is seen in the reference age group (3.8%). Most of the LSCS done for patients ≥35 years is for induction failure (15.4%).

4. Discussion

This population-based study with prospectively collected data concerning singleton primiparous women showed that the mode of delivery differed over the maternal age strata. Significantly more normal vaginal deliveries and fewer CS and instrumental vaginal deliveries were seen among the teenagers and among women aged 20–24 compared with the reference group of women aged 25–29. The opposite was found among older women showing an increased risk for CS compared with women aged 20–24 years. Women aged 20–24 were more prone to PPH. The risk of placentae praevia increased dramatically with maternal age.

The finding of a preferable birth outcome with lower CS rates and lower rates of instrumental delivery among teenagers compared with older women has been pinpointed to a lesser extent than observed adverse outcomes. Earlier studies have shown relatively consistent results concerning a decreased rate of CS in the adolescent group and a higher rate in women with advancing age. Babagana et al [3] (2014) in their study found that the incidence of caesarean section among the elderly primigravidae was higher than among the younger group. This is similar to the series reported from other centres (Bell JS et al., 2001; Cleary-Goldman et al., 2005;. Jirattigalachote and Prechapanich, 2008). Concerns about the maternal age as a cause of increase maternal and perinatal morbidity and mortality has made the routine recommendation of elective caesarean section for these women in the past and this tradition has been maintained by many doctors as seen in their study with many of the caesarean sections been done based on this presumption. Those done for fetal distress accounted for only 6.89 %.

Yu Jin Koo (2011) [4] found in their study that the risk for arrest disorder was higher in the elderly age group. Furthermore physicians tend to worry more about older mothers. Therefore, it is unclear whether elderly women actually have higher intrinsic factors for arrest disorder.

J D Ojule(2011) [5] in their study showed that up to 58.1% of the elderly primigravidae had caesarean delivery as compared to 32.1% of the younger primigravidae ($\chi = 23.75$, $P = 0.001$). The main indications for the caesarean deliveries were severe pre-eclampsia with unfavourable cervix, breech presentation, cephalopelvic disproportion, and placenta previa. However, the instrumental vaginal delivery rates of 4.4% and 2.9%, respectively, for the elderly and young primigravidae was not significantly different ($\chi^2 = 4.57$, $P = 0.06$).

Labour becomes difficult with advancing age because the perineum becomes less rigid and due to less reserve power of uterine contractions. Because of presence of high risk factors and the labour abnormalities there is a high risk of caesarean rate in the elderly age group.

A low rate of instrumental deliveries and CS among adolescents and a high rate among older women have almost unanimously been shown in several reports from high-income as well as low-income countries [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18]. Whether this phenomenon depends on differences in handling the delivery, inherent or cultural behavioural, domestic or social attitudes among the obstetric staff or biological factors has not been investigated. Advancing age is associated with impaired uterine contractility as well as endothelial dysfunction which theoretically may lead to impaired uterine and uteroplacental function. [19, 20]. Adolescents in our study had a lower risk of induction of labour, PPH, placental abruption and placenta previa, and women with advancing age had higher risks of preeclampsia and placenta praevia .The study was to evaluate obstetric and neonatal outcomes in different maternal age groups compared with women aged 25–29 overall. To demonstrate causality between the different outcomes evaluated in the analyses and maternal age a great number of putative intermediaries could have been

considered such as the use of fertility treatment, fetal size, gestational weight gain, etc, but that was not the purpose of the study. There may be other variables (which are not intermediaries) but we have not been able to identify them.

5. Conclusion

In conclusion, in a country like India, with a developing social and antenatal maternity healthcare security system, giving cost-free maternity and obstetric care to all pregnant women had a decreased risk for adverse obstetric outcome compared with the reference group. In the same social context childbirth at extremes of ages was associated with a number of serious complications for the woman. For clinicians, counselling young and elderly mothers are of great importance to highlight the positive consequences, obstetric complications and favourable outcomes that can come with antenatal care. There is a need for individualising the antenatal surveillance programmes and obstetric care based on age grouping in order to improve the outcomes in the age groups with less favourable obstetric outcomes. India, with its growing population needs to address this issue with all possible measures.

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