



Association of Maternal Age and Low Socio-Economic Status of Women on Birth Outcome

Mousumi Gogoi

International Institute for Population Sciences Deonar, Mumbai-400088 INDIA

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Abstract

Teenage pregnancy is a major public health problem showing poor socio-demographic consequences while poor socio-economic status shows the effects of weak national and local economies on health outcomes and limitation of resources which may reduce the availability of good-quality health services, including obstetric and neonatal care. The main objective of the study is to examine the risk of adverse pregnancy outcomes associated with young maternal age and poor socio-economic status of women in India. Third round of National Family Health Survey (2005-06) data has used and the eligible adolescent women were included in the analysis. Cross tabulation, chi-square test and binary logistic regression were performed to fulfil the study objective. Preliminary result shows that a young and poor woman reports more complications during pregnancy and lesser use of any health care services. Young mothers develop more perinatal complications like preterm delivery (34.5%), low weight at birth baby (27.4%), small size at birth baby (25.9%) as compared to adult mothers. There is a significant correlation found between having any complication during pregnancy and adverse birth outcome among adolescent women. Teenage pregnancy is still high privileged in India showing various health complication during pregnancy and adverse birth outcome. It is a serious matter of concern for the mother and child which need an effort to aware women about the health consequences of teenage pregnancy.

Keywords: Adolescent, birth outcome, poverty, pregnancy complication, preterm delivery.

Introduction

Pregnancy at young age has considered as one of the major social problem worldwide and serious issue for both the mother and the new-born as they are prone to various social, emotional, economic and health problems. Mothers who are pregnant at a young age are usually still less knowledge of nutrition so it will result in the lack of various substances that have needed when growth will thus result in the increase of premature birth, low-birth-weight and congenital defects. The association between mother's age and outcome simply reflect the harmful socio-demographic environment of most pregnant adolescents or whether biologic immaturity. Various literatures have suggested that there is an association between pregnancy in younger ages and poor birth outcomes like low-birth weight, pre-term births, and pregnancy wastage^{1,2}. In the developing countries, the problem of poor pregnancy outcomes among the young mothers is further exacerbated by poor maternal health-care utilization³. In India, teenage pregnancy is a major public health problem showing poor socio-demographic consequences. There is a relatively high level of pregnancy complications among young mothers because of physiological immunity, lack of experience regarding child care practices which may influence on the health of the mother and the child. Moreover, an early start to motherhood may reduce the educational attainment and employment opportunities of women and is associated with higher levels of fertility⁴.

On the other hand, the poor socio-economic status of the mother is associated with low-birth-weight babies⁵. Various house-hold responsibilities, working for an income, lack of adequate care during pregnancy along with severe malnutrition contributes women in delivering low-birth-weight infants^{6,7}. The consequences of young and illiterate mothers have reinforced by the fact that their children may also tend to face the same condition of economic and health burden as experienced by their mothers. Number of studies has showed that early marriages that have associated with various health consequences like early child bearing when the women is not biologically mature to bear the foetus. As such, a pregnant woman in her young age has a high risk of abortion and also with an increased risk of poor maternal and infant outcomes like maternal death and of delivering an infant with low-weight at birth⁸.

Measurement of pregnancy outcomes: For the study purpose adverse pregnancy outcomes like preterm delivery, abortion, low weight at birth infant and small size at birth infant were included. Preterm birth has defined as a birth occurring before 37 weeks' gestation. Abortion has defined as a pregnancy terminates or terminated before 20 weeks of gestational age, and a baby is said to have low-birth weight when the weight of the baby is less than 5 pounds (2,500 grams) at birth. The low-birth-weight new-born has higher chances of risk factors like early and post-neonatal mortality as compared to an infant with normal weight at birth. Low-birth weight can occur in premature babies or in babies who have born at the regular time but are

underweight (intrauterine growth restriction [IUGR]). In the absence of birth weight, the size of baby at birth has taken as a useful proxy variable for birth weight. Children whose birth weight is less than 2.5 kilograms or reported to be 'very small size at birth' or 'smaller size than average' are considered to have a greater risk of early childhood death.

Defining Poverty: Poverty as a distinct entity has proven difficult to measure. Socio-economic status (SES) often assessed by educational level, income, occupation, and housing conditions that have used as a proxy measure for poverty. Poverty is a wider concept in nature and more complicated implications on maternal health outcomes. Wealth Index has developed with the combination of household assets to see the inequalities in household income and used for health services and health outcomes⁹. In NFHS-3, the wealth index was constructed by using household asset data and various housing characteristics. Lower socio-economic status has associated with poorer health outcomes which cause of mortality, with particular diseases more affected by socio-economic status than others¹⁰. Lower socio-economic status can associate with various morbidities among man, women and children because of lack of wealth to access health care and nutritional supplementations. During pregnancy lack of money and utilization of health care facilities may lead to poor maternal outcome which causes morbidity and mortality for both mother and the child. Concerning the above mentioned views the main aim of the study is to see the association between maternal age and lower socio-economic status of women and adverse pregnancy outcome and also to examine the antenatal care utilization during pregnancy on complications and birth outcomes in India.

Material and Methods

For the study purpose data has been used from the third round of National Family Health Survey (NFHS-3), which was conducted during 2005-06. The NFHSs are large-scale population-based surveys that cover more than 99 percent of the total population of India. The first round of NFHS was conducted during 1992-93, the second round was conducted in 1998-99. These surveys provided and collected reliable information regarding various dimensions related to fertility, family planning, infant and child mortality, reproductive and child health, nutrition and other health related issues including HIV/AIDS in national and state level.

NFHS-3 collects information using three different survey schedules like household schedule, women's questionnaire and the men's questionnaire from the sampled households in all 29 states. In this study the woman's questionnaire has used which has collected detailed information regarding the reproductive histories, health of women and other health related complications, nutrition and other issues related to mother and the children for the five years proceeding to the survey. For the study purpose, the women's files have been used to bring out

how young maternal age and poverty has an association with adverse pregnancy outcomes. For this purpose, women belong to less than 20 years of age group and lower socio-economic strata were selected.

Description of variables: Dependent variables: Pregnancy outcomes such as premature birth (small for gestational age); low weight at birth (LWB), experience of ever had abortion and small size of the baby at birth (SSB) have taken as dependent variable in the study.

Independent variables: The study includes a set of independent variables to interpret or to understand the interrelationship between poverty and young maternal age with adverse birth outcomes. The other socio-demographic characteristics of women include current age of the women (less than 20 years and more than 20 years), place of residence (rural, urban), religion (Hindu, Muslim, Christian and others), educational attainment (uneducated, primary, secondary and higher), wealth index (poor and non-poor), and exposure to mass media (exposed and not exposed) and with any complications during pregnancy, etc.

Techniques for data analysis: Appropriate bivariate and multivariate analysis have done to capture the association between young maternal age and low socio-economic status with poor birth outcomes (premature birth, abortion, LWB and SSB). Cross tabulation and multivariate analysis, i.e. logistic regression analysis, has done to show the impact of selected socio-demographic factors on adverse pregnancy outcomes among young and poor mothers in India.

Binary logistic regression has been done to show the young maternal age and poverty and associated pregnancy outcomes. The dependent variables included in the study are premature delivery has coded as 1= premature delivery, and 0 = otherwise, abortion has coded as 1= ever had an abortion experience and 0 = otherwise, weight at birth has coded as 1= low weight at birth and 0= otherwise and lastly small size at birth has coded as 1= very small size as birth and 0= otherwise.

Ethic statement: There are no ethical issues related to the data that used for the study. The National Family Health Survey (NFHS-2005-06) data was conducted under the collaboration of Ministry of Health and Family Welfare, Government of India, with the International Institute for Population Sciences, Mumbai.

Findings: Childbearing status with Maternal Age and Wealth Index: Study shows that proportion of women aged 15-19 years, among them 12 percent has become mothers and 4 percent are currently pregnant with their first child. It meant one in six women age 15-19 have begun childbearing. The percentage of women who have begun childbearing or become pregnant increases sharply with the increasing in age from 3 percent at age 15 years to 36 percent at age 19 years. The

childbearing is more than twice among women aged 15-19 years in rural areas as compared to urban areas, which is 19 percent and 9 percent respectively. It shows a rural-urban differential in adolescent motherhood that is still prevalent in rural Indian societies. Finding reveals that the level of young age motherhood is about five times more for women belongs to the household of lowest wealth index than that of the women from highest wealth index has shown in table-1.

Pregnancy, Poverty and Birth Outcomes: Young age pregnancy and poverty, both are considered as a factor of poor health outcome. Proportion of women having adverse birth outcomes with different background variables has shown in table 2. Premature birth, abortion, low weight at birth and very small size at birth has considered as the poor birth outcome in the study. Around 35 percent of women aged, less than 20 years were ever experienced premature birth, and that is decreasing with increasing in age of the women (4 percent) ($\chi^2=14.5$; $p<0.01$). The results do not show differentials in reporting of ever experience of abortion by age of women as well as by wealth quintile in the study region. But there is a positive association has seen among having any complication during pregnancy and had an abortion among he studied women ($\chi^2=6.74$; $p<05$).

About 20 percent of women had reported of delivered a low-birth-weight baby and 21 percent reported of having a baby with small size at birth. Proportion of both the outcomes (LWB and SSB) is higher among young (27 and 26 percent) ($\chi^2=4.9$; $p<01$ and $\chi^2=15.0$; $p<0.01$) and poor (24 and 23 percent) ($\chi^2=2.8$; $p<0.10$ and $\chi^2=5.3$; $p<01$) mothers respectively. At the same,

low-weight baby and small sized baby is found higher among rural women as compared to urban women ($\chi^2=4.3$; $p<05$ and $\chi^2=3.0$; $p<01$). From the analysis, it has found that women having any complications during pregnancy were more likely to deliver low weight at birth baby and small size at birth baby ($\chi^2=2.8$; $p<10$ and $\chi^2=5.3$; $p<01$).

Access to Health Services and Pregnancy Outcome: The provision of affordable and accessible care can affect maternal health through level of usage of antenatal-care, safe delivery and essential obstetric care during pregnancy. The provision of care by the public sector has reviewed regularly to make the services more relevant. There is a rich-poor gap in adverse pregnancy outcomes that poorer women receive less prenatal care as compared to the rich women¹¹. Table 3 shows that those women are poor and young among them 38 percent reports of having preterm delivery and has visited more than three antenatal check-ups during her pregnancy. Low weight at birth baby is found to be higher among women those who are not receive any ANC check-up and not receiving any IFA tablets or equivalent syrup during her pregnancy. Proportion of small size at birth baby has found higher (31 percent) among women who do not receive any TT injection during her pregnancy as compared to those received more than two injections (24 percent). From the analysis it has found that young aged mothers have an increased the risk of poor health and pregnancy outcomes, and it has generally said that young women are less likely to use maternal health care services than older women because of lack of knowledge regarding probable health related complications during and after pregnancy.

Table 1
Percentage distribution of the studied women by background characteristics, India, 2005-06

Background Characteristics	Have had a live birth	Are pregnant with first child	% who have begun childbearing	Number of women
Age in years				
15	1.3	1.2	2.5	4,814
16	4.1	2.3	6.4	5,237
17	8.6	3.8	12.5	4,801
18	17.9	6.1	24.0	5,606
19	29.7	6.1	35.7	4,353
Residence				
Urban	6.3	2.4	8.7	7,463
Rural	14.5	4.6	19.1	17,343
Wealth Index				
Lowest	19.2	6.0	25.3	4,432
Second	17.3	4.5	21.9	5,071
Middle	12.6	3.7	16.3	5,390
Fourth	8.2	3.5	11.7	5,181
Highest	3.3	1.8	5.1	4,738
Total	12.1	3.9	16.0	24,811

Table-2
Distribution of respondents by background characteristics and experience of adverse birth outcome in India, 2005-06

Background Characteristics	Adverse Birth Outcomes							
	Premature Delivery	χ^2	Abortion	χ^2	Low weight at birth	χ^2	Small size at birth	χ^2
Respondent's Age								
Less than 20 years	34.5	14.5** *	0.1	4.90	27.4	4.9***	25.9	15.0** *
20-29 years	11.7		0.3		20.0		20.4	
30-39 years	5.1		0.2		16.3		19.4	
More than 40 years	3.8		0.2		15.5		16.2	
Residence								
Urban	11.8	0.9	0.1	12.4*	16.9	4.3**	18.3	3.0***
Rural	11.8		0.4		22.0		21.4	
Educational Attainment								
None	10.0	15.3** *	0.3	7.02* *	23.9	8.3**	21.6	8.3***
Primary	13.1		0.3		24.8		23.1	
Secondary	13.3		0.3		18.8		19.7	
Higher	12.2		0.0		13.8		13.4	
Religion								
Hindu	11.9	9.3**	0.3	5.07*	19.4	4.8	20.5	6.2*
Muslim	11.0		0.4		19.6		20.7	
Christian	9.7		0.6		18.3		17.0	
Others	14.5		0.0		23.9		22.9	
Wealth Index								
Poor	11.0	0.20**	0.7	3.44*	24.1	31.3**	22.7	5.8***
Non-Poor	12.3		0.2		18.5		18.9	
Exposure to mass media								
No	10.2	2.4	0.3	0.30	26.8	18.2	22.7	13.5*
Yes	12.8		0.3		20.8		20.2	
Any pregnancy complications								
No	12.0	0.94	0.2	6.74* *	19.2	2.8*	18.5	5.3***
Yes	11.6		0.3		20.3		21.7	
Total	11.8		0.3		19.6		20.5	

Note: ***p<0.01, **p<0.05, *p<0.10

Table-3
Access to health care services and pregnancy outcome among young and poor women in India, 2005-06

Access to health care	Birth Outcomes			
	Premature Delivery	Abortion	Low weight at birth	Small size at birth
ANC Visit				
No visit	20.9	0.6	44.4	24.3
At least one visit	27.5	-	12.5	31.9
More than one visit	38.0	0.1	27.2	25.8
Receive IFA tablet/syrup				
No	21.4	0.4	28.8	26.1
Yes	38.7	0.1	25.0	25.5
Receive TT injection				
No	22.9	1.0	10.5	31.0
Less than two injection	39.4	-	16.7	23.6
More than 2 injection	33.1	0.1	28.1	24.7
Place of delivery				
Home	30.0	0.3	26.8	29.8
Institution	33.3	0.1	23.5	22.5
Total	32.1	0.2	26.2	25.6

Note: '-' Number of sample size is very small (<20)

Table-4
Results of logistic regression analysis of adverse pregnancy outcomes in India, 2005-06

Background Characteristics	Premature Delivery	Abortion	Low weight at birth	Small size at birth
	Exp (β)	Exp (β)	Exp (β)	Exp (β)
Respondent's Age				
Less than 20 years [®]	1	1	1	1
20-29 years	0.24***	1.99	1.12	0.87**
30-39 years	0.10***	1.12	1.31**	0.86**
More than 40 years	0.11	1.65	1.47	0.56***
Residence				
Urban [®]	1	1	1	1
Rural	0.94	3.16**	0.79***	1.02
Educational Attainment				
None [®]	1	1	1	1
Primary	1.02	0.93	0.84	1.16**
Secondary	1.26***	1.09	1.17	1.04
Higher	1.62***	0.00	1.53***	0.59***
Religion				
Hindu [®]	1	1	1	1
Muslim	1.13**	1.53	0.87**	0.90**
Christian	1.02	0.44	0.96	1.02
Others	1.34**	0.00	0.69**	1.10
Wealth Index				
Poor [®]	1	1	1	1
Non-Poor	1.07	0.94	0.99	0.93*
Exposure to mass media				
No [®]	1	1	1	1
Yes	1.12**	1.10	1.16*	0.88***
Any pregnancy complications				
No [®]	1	1	1	1
Yes	1.85***	2.17**	1.07	1.20***

Note: *** p<0.01, **p<0.05, *p<0.10, [®] Reference Category

Results of logistic regression: The result of odds ratios and confidence intervals from the logistic regression analysis for pregnancy outcomes like pre-term delivery, abortion, low weight at birth baby and small size at birth baby presented in Table 4. Results suggested that the age is a significant factor of poor outcomes i.e. premature birth and very small size at birth baby. It implies that as compared to young mothers there is a lesser chance of delivering premature birth and small size at birth baby by the adult mothers. Regression analysis also confirms that there is an association between wealth index and poor health outcomes. It has found that non-poor women are less likely to have experience of adverse birth outcomes as compared to poor women, and a significant relationship has

seen between maternal poverty and birth outcome. It clearly shows that women having any complications during pregnancy were more likely to have any experience of adverse birth outcome, and it is statistically found significant.

Discussion:

The main focus of the study is to examine the association between maternal age and economic status of women on adverse impact on birth outcome. As maternal characteristics have an influence in pregnancy outcome. Appropriate maternal age to conceive without risk for undesirable outcomes is 20-35 years. Underage (below 19 years) and over age mothers (above 35 years) were at risk of poor pregnancy outcomes such as

premature birth, small for gestation and low-birth-weight babies and high neonatal mortality¹². Government and other international organizations have provided various efforts in improving maternal healthcare utilization during the last few years. Studies show that there is an association between early pregnancy and poor health and pregnancy outcome¹³⁻¹⁶ and various evidence from the developing world shows that young mothers are more likely to suffer from severe delivery complications resulting in adverse pregnancy outcomes, high maternal mortality, and poor maternal health¹⁷⁻²⁰.

Average monthly income also has an impact on the family as well as on health of the mother and the child. Low-household income directly affects the consumption of food habit and nutritional supplementation, thus increasing the risk for poor pregnancy outcome. Young maternal age and low socio-economic status has a positive association with adverse pregnancy outcome, and these have observed from bivariate and multivariate analyses. The result shows a higher incidence of poor pregnancy outcomes among very young aged mothers who resides in rural areas and mainly belongs to lower socio-economic strata. However, few of the factors that are not found statistically significant, possibly due to the small number of cases and, therefore, insufficient control to identify statistical significance. Poverty or low socio-economic status has an association with increasing various medical and behavioural risk factors that may lead to deliver preterm birth and other adverse pregnancy outcomes²¹. Preterm birth and low-weight birth has highly reported by young and poor mother's. India is the second largest populous country next to China, with an increasing rate of teenage pregnancy and which is an important factor for population increase, is likely to be aggravating the problem²². It may be because of poor literacy level among young girls' who are getting married early and becoming pregnant before achieving their own growth potential. Premature birth and small size at birth were the adverse outcomes of poor pregnant women with several chronic stressors, worse and overcrowded surroundings, lack of employment, lack of social support and financial problems²³. Proper antenatal check-ups, delivery at institute and postnatal care may also help to reduce maternal and perinatal morbidity and mortality, as well as poor birth outcome among adolescent motherhood²⁴.

Conclusion

In the recent decade, teenage pregnancy is more of a serious issue which may lead to various social, as well as individual health consequences among the teenagers. Lack of knowledge regarding sexual health and related health outcome among teenagers, plays an important role in childbearing at younger ages and poor health outcome which needs proper sex education. In spite of these there is an urgent need to understand the magnitude of the problem of poor birth outcomes and to better understanding the factors including cultural practices, access to health care facilities especially among young and poor women for healthy future generation.

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