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Original Research Article

The obstetric factors and outcome of adolescent pregnancy having IUGR babies

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ABSTRACT

Introduction: Adolescent childbearing is still a common social and health concern in Bangladesh. Adolescent maternity is causally associated with many poor obstetric complications. Low birth weight is one of the most common problems in adolescent pregnancy and majority of these LBW babies is due to intrauterine growth retardation (IUGR). The aim of the study was to evaluate the obstetric factors and outcomes of adolescent pregnancy having IUGR babies.

Methods: This cross-sectional descriptive type of study was conducted at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital from the period of January 2012 to June 2012. In this present study, 150 adolescent mothers selected. Sample technique was purposive sampling. Detailed medical, obstetric and neonatal information recorded on a designed data sheet. Data were analyzed using statistical program SPSS.

Results: The mean age of all adolescent mothers was 18.14 ± 0.85 , while mean age at marriage found 16.24. All the adolescent respondents were married and 9 out of 10 were living with husband (91%). Higher proportion (70%) of Hindu respondents delivered IUGR babies. 60% pregnancies were unplanned, of them, 36% developed IUGR. High proportion of maternal and neonatal complications found among the mothers having IUGR babies. More common maternal complication were severe anemia (65%), fetal distress (56.2%), oligohydramnios (43.8%), pre-eclampsia (35.4%), eclampsia (33.3%), PPH (23%), puerperal sepsis (14.6%) and more common neonatal complications were birth asphyxia (96%), hypoglycemia (83%), hyperbilirubinemia (8.3%) and sepsis (8.3%).

Conclusions: Adolescent pregnancy complicated with IUGR demonstrated higher proportion of maternal complications like severe anemia, pre-eclampsia, eclampsia, oligohydramnios, PPH, and adverse perinatal outcome.

Keywords: Adolescent pregnancy, Pregnancy outcome, Intrauterine growth retardation

INTRODUCTION

Adolescent childbearing is still a common social and health concern in Bangladesh. Twenty-eight percent of Bangladeshi girls age 15-19 have begun childbearing.¹ Adolescent maternity is causally associated with many poor obstetric factors. Low birth weight (LBW) is one of the most common problems in adolescent pregnancy and majority of these LBW babies is due to intrauterine growth retardation (IUGR). Hospital-based studies conducted in developing countries including Bangladesh,

clearly documented that adolescent maternity is causally associated with poor obstetric indicators like antenatal care, delivery by skilled personnel and perinatal death. Neonatal, infant and under-5 mortality also found highest among adolescent mothers. In Bangladesh, fifty-nine percent of women marrying before the age 18, the legal age of marriage¹. Early marriage typically leads to increase risk of adolescent childbearing.² The adolescent specific fertility rate has declined by almost a quarter between 2001 and 2016, from 123 to 104 per 1,000 women.² Consequently, age specific maternal mortality

rate for the age group 15-19 has also declined to 134/100000 live births which was 170 during 20012. For years, it has accepted that adolescent pregnancy is a high-risk pregnancy. It is estimated that in developing countries about 21 million girls aged 15-19 years become pregnant and of them about 12 million give birth each year.³ Bangladesh LBW survey 2004 reported that in Bangladesh, more than one out of every three children, or 1.03 million babies each year, are born with low birth weight. Only 23% of all these LBW infants were pre-term, which means that remainder 77% of LBW infants was growth retarded. Some of the preterm LBW infants may have been growth retarded as well as preterm. This confirms that the majority of LBW infants in Bangladesh are small due to IUGR. Usually adolescent girls are anemic, malnourished and neglected. They become pregnant before achieving their own growth potential. This leads to disappointing pregnancy outcome. Feature of IUGR in adolescent pregnancy can explain in part by biological factors such as immaturity of the female reproductive system and inadequate prenatal weight gain, and in part by socio cultural and lifestyle factors such as education and poverty. Several studies conducted previously focusing on LBW rather than IUGR. IUGR not well demarcated in those studies. Very limited efforts made to identify the obstetrical and lifestyle determinants of IUGR among adolescent pregnancy. IUGR still accounts for a large incidence of infant mortality and morbidity in Bangladesh. Identification of IUGR is crucial because proper evaluation and management of IUGR can result in a favorable outcome. So, it is very important to diagnosis earlier IUGR during pregnancy especially among adolescent.

Objectives

General objective

To evaluate the obstetric factors and outcome of adolescent pregnancy having IUGR babies.

Specific objectives

To identify the proportion of IUGR among adolescent pregnancy. To describe obstetric characteristics related to IUGR in adolescent pregnancy. To evaluate the outcome of adolescent pregnancy having IUGR. To identify the socio demographic factors related to develop IUGR in adolescent pregnancy.

METHODS

This cross-sectional descriptive type of study conducted at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital from the period of January 2012 to June 2012. Sample technique was purposive sampling. 150 pregnant adolescents (13-19 years) admitted to the obstetrics and gynaecology department for delivery were enrolled in this study following the inclusion and exclusion criteria. IUGR baby was

diagnosed as the new born with birth weight less than the 10th percentile for their gestational age and less than 2500 gm, meeting physical features of growth restriction like, larger head circumference, dry and wrinkled skin, less subcutaneous fat, scaphoid abdomen, thin meconium stain, old man look, etc. The reliability of the diagnosis further investigated using per abdominal finding of height of the uterus. Amount of liquor also carefully recorded to diagnosis of IUGR. The age at marriage defined as the age at which the respondent began living with her husband. Gestational age was calculated from the first day of the last menstrual period reported by the mother, as well as estimates of gestational age was derived by available ultrasound measurement at antenatal visits. LBW was defined as birth weight less than 2500 gm. Preterm labor (PTB) was defined as labor occurs before 37 completed weeks. Weight of previous babies were determined based on mother perception of size of infant. Detailed medical, obstetric and neonatal information recorded on a designed data sheet. Data were analyzed using statistical program SPSS. Point estimate of different variables computed; data expressed as mean \pm SD or in percent. Findings also compared between the two groups of adolescent pregnancy (pregnancy complicated with IUGR and normal adolescent pregnancy).

Inclusion criteria

Adolescent girls aged 13 to 19 years. Pregnancy duration beyond 28 completed weeks of pregnancy.

Exclusion criteria

Mother with pre-existing medical complication like, heart disease, kidney disease, bronchial asthma, diabetes mellitus, hypothyroidism, connective tissue disorders, hypertension. Intra uterine death.

RESULTS

The mean age of all adolescent mothers was 18.14 ± 0.85 , while mean age at marriage found 16.24. All the adolescent respondents were married and 9 out of 10 were living with husband (91%). All most similar distribution found among the adolescent mothers who developed IUGR. About three fourth of all respondents were from rural areas and the remaining 25% were from urban and urban slum areas. Among the respondents of urban slum, two third developed IUGR. Among the all respondents, the vast majority (84%) belonged to Muslim and most of the remainder was Hindu (11%). Higher proportion of Hindu respondents developed IUGR. When total 17 Hindu respondents were enrolled in the study, 12 (70%) of them delivered IUGR babies (Table 1). Employee women were more than twice as likely as housewife women to develop IUGR (57% and 24% respectively). Respondents were also asked about their type of daily work and it was found that 22% respondents were involved with strenuous work. Among the strenuous

worker 61% developed IUGR while among the normal worker, 24% developed IUGR.

Table 1: Distribution of respondents by selected background characteristics.

Characteristic	Mother of IUGR babies (n=48)	All adolescents mother (n=150)
Age of the respondents		
Mean Age (years)*	18.27±0.73(17-19)	18.14±0.85(16-19)
Residence		
Urban	4 (8 %)	29 (19%)
Rural	35 (73%)	107 (71%)
Urban slum	9 (19%)	14 (10%)
Marital status		
With Husband	44 (92%)	137 (91%)
Separated	3 (6%)	12 (8%)
Widowed	1 (2%)	1 (.7%)
Mothers' age at marriage		
Mean age at marriage*	16.52 ±1.09	16.24 ±1.24
Religion		
Islam	30 (63%)	126 (84%)
Hinduism	12 (25%)	17 (11.3%)
Buddhism	1 (2%)	1 (.7%)
Christianity	5 (10%)	6 (4%)

* Data are expressed in mean ± standard deviation (range)

Table 2: Distribution of respondents by socio-economic variables.

Variables	Mother of IUGR babies (n=48)	All adolescents mother (n=150)
Occupation		
Housewife	28 (58 %)	115 (77 %)
Employee	20 (42 %)	35 (23 %)
Physical activity during pregnancy		
Strenuous	20 (42%)	33 (22%)
Sedentary	28 (58%)	117 (78%)
Habit of mid-day sleep		
Yes	5 (10%)	10 (7%)
No	43 (90%)	140 (93%)
Family monthly income		
Mean monthly income (Taka)	5838	6126
Mothers' education		
Primary	21 (44%)	82 (55%)
Secondary	4 (8%)	11 (7%)
No education	23 (48%)	57 (38%)

The average monthly income was calculated 6126 taka among all adolescent mothers and 5838 taka among mother who delivered IUGR babies. IUGR was more likely to found among the women with no education.

Table 3: Distribution of respondents by history of present pregnancy.

Variable	Among all adolescents mother (n=150)	Developed IUGR babies (n=48)
Parity		
0	97 (64.7%)	32 (67%)
0+1	11 (7.3%)	6 (13%)
1	24 (16%)	6 (13%)
1+1	9 (6%)	3 (6%)
0+2	9 (6%)	1 (3%)
Pregnancy plan		
Planned	61 (40.7%)	16 (33%)
Unplanned	89 (59.3%)	32 (67%)

Table 4: Anthropometric parameters of the respondents.

Variable	Total adolescents mother	Mother of IUGR babies
Mother height (cm)		
<145	21(14%)	7(15%)
145-150	27(18%)	7(15%)
151-156	81(54%)	30(63%)
>156	21(4%)	4(8%)
Mean height*(cm)	152.68± 9.4	151.94± 9.97
Body built		
Lean	32 (21%)	20 (63%)
Medium	112 (74%)	25 (22%)
Obese	6 (4%)	3 (50%)
Pre delivery BMI		
<19.8 kg/m2	40%	42%
19.8-26 kg/m2	51%	53%
>26 kg/m2	9%	5%
Mean Pregnancy BMI*	25.3± 4.57	24.3± 3.95

* Data are expressed in mean ± standard deviation

Among all adolescent mother more than one in three (38%) women had never been to school and IUGR found 40% among those mothers (Table 2). About two third of the adolescent studied were primi gravida irrespective of developing IUGR babies. Among the all-adolescent 60% were unplanned, of them, 36% developed IUGR while among the planned pregnancy 26% developed IUGR (Table 3). Adolescent having lean body build and height ranges from 151 to 156 cm, developed more IUGR babies. More than half IUGR developing mother's pre delivery BMI ranges from 19.8-26 kg/m2 (Table 4). Among the all-150 adolescent mothers, 48 mothers (32%) developed IUGR baby and 43 (29%) were PTB, while 17% of them were both PTB and IUGR. Not all preterm babies developed IUGR. It was found that out of 43 PTB, 26 (60%) developed IUGR while a large portion (40%) of them did not develop IUGR. Mean gestational age of

IUGR babies recorded as 36.27±1.84 weeks (range 33-40) (Table 5).

Table 5: Distribution of adolescent mothers by gestational age.

Gestational age (weeks)	Mother of IUGR babies n=48(32%)	All adolescents mother n=150
<37 (Preterm)	26 (54%)	43 (29%)
37-39	19 (40%)	80(53%)
40-42	3 (6%)	21 (14%)
>42	0 (0.0%)	6(4%)
Mean gestational age (weeks)*	36.27 ±1.84 (33-40)	37.78 ± 2.13 (33-42)

*Data are expressed in mean ± standard deviation (range)

Among all the 150 adolescent mothers, 67 mothers (45%) developed LBW baby, 38 mothers (25%) developed both LBW and PTB and 26 (17%) mother developed together LBW, PTB and IUGR. It was found that while among all the LBW babies, 38 (57%) were preterm, then 48 (72%) of them developed IUGR (Table 6). High proportion of

IUGR developing mother found having poorer dietary pattern during their pregnancy period. Substantial proportion of adolescent girls who develop IUGR babies did not consume milk (65%), meat (59%) and Fish (19%) at least one time per week (Table 7).

Among the IUGR developing mothers, proportion of IUGR progressively increased with decreased number of ANC taken. For example, 12% of IUGR developed among those mother who had taken more than two ANCs compared with 35% and 37% who had taken one and no ANC respectively (Table 8). Most of the maternal complications found high proportion among the mothers who developed IUGR. Severe anemia (65%), fetal distress (56.2%), oligohydramnios (43.8%), pre-eclampsia (35.4%), eclampsia (33.3%) were found more common among the mother who developed IUGR babies. On the other hand, proportion of PIH, GDM, APH, POL, PROM were noted very less among the IUGR baby's mother and similar low proportion of these characteristics were also noted among all adolescent mothers (Table 9). Among the IUGR baby's mother, major mode of delivery was cesarean section (67%), followed by Induced vaginal delivery (23%) and NVD (10%). No forceps delivery was noted among them (Table 10).

Table 6: Distribution of all respondents by gestational weeks and birth weight and development of IUGR.

Babies weight at birth (kg)						
Gestational age (weeks)	Developed IUGR	≤1500	1501-2000	2001-2499	≥2500	Total
<37	IUGR	3 (2.0 %)	22 (15.0%)	01 (0.6 %)	0 (0.0%)	26 (17%)
	No IUGR	0 (0.0%)	01 (0.6 %)	11 (7.0%)	5 (3.3 %)	17 (11%)
37-39	IUGR	0 (0.0%)	11 (7.0%)	08 (5.0%)	0 (0.0%)	19 (13%)
	No IUGR	0 (0.0%)	01 (0.6 %)	06 (4.0%)	54 (36%)	61 (41%)
40-42	IUGR	0 (0.0%)	02 (1.3%)	01 (0.6 %)	0 (0.0%)	03 (2%)
	No IUGR	0 (0.0%)	0 (0.0%)	0 (0.0%)	18 (12%)	18 (12%)
>42	IUGR	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (4%)	06 (4 %)
	No IUGR	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total		3 (2%)	37 (25%)	27 (18%)	83 (55%)	150 (100%)

Table 7: Weekly pattern of consumption of selected food items by the respondents.

Food items	Frequency of consumption /week					
	Mother of IUGR (n=48)			All Adolescents (n=150)		
	%			%		
	0	1-3	>4	0	1-3	>4
Egg	17	65	18	16	65	19
Milk	65	30	5	60	30	10
Meat	59	36	5	55	39	6
Fish	19	57	24	15	60	25
Vegetable	16	51	33	18	44	38

The most common complication was inadequate lactation, which occurred among 37% of mother who delivered IUGR babies. PPH, UTI, PPE were recorded in

20 to 23% cases and proportion of RTI and puerperal sepsis were about 13% each. Only one adolescents experienced anemic heart failure (Table 11). Babies who

developed IUGR more likely to have birth asphyxia (96%) and hypoglycemia (83%). Few proportion of IUGR babies developed sepsis, hyperbilirubinemia, diarrhoea. However, meconium aspiration syndrome, convulsion, congenital pneumonia and anomalies were recorded none of the IUGR baby (Table 12).

Table 8: Distribution of respondents by number of antenatal care visits.

Number of ANC visits	Mother of IUGR babies (n=48)	All adolescents mother (n=150)
One time	17 (35.4%)	42 (28%)
Twice	7 (14.6%)	54(36%)
More than two	6 (12.5%)	26 (17.3%)
No ANC	18 (37.5%)	28 (18.7%)

Table 9: Obstetric characteristics of the mother having IUGR baby.

Obstetric characteristics	Mother of IUGR babies (n=48)	All adolescents mother (n=150)
Severe anemia	31 (65%)	76 (51%)
Oligohydramnios	21 (43.8%)	26 (17.3%)
Pre-eclampsia	17 (35.4%)	27 (18%)
Eclampsia	16 (33.3%)	22 (14.7%)
Fetal distress	27 (56.2%)	59 (39.3%)
Jaundice	5 (10.4%)	16 (10.7%)
APH	3 (6.2%)	9 (6%)
Pregnancy induced hypertension (PIH)	2 (4.1%)	25 (16.7%)
Premature onset of labor (POL)	4 (8.3%)	18 (12%)
Premature rupture of the membranes	4 (8.3%)	27 (18%)
Gestational diabetes	1 (2.1%)	2 (1.3%)
Polyhydramnios	0 (0.0%)	0 (0.0%)
Chorioamnionitis	0 (0.0%)	6 (4%)

Table 10: Distribution of respondents by mode of delivery.

Mode of delivery	Mother of IUGR babies (n=48)	All adolescent mothers (n=150)
NVD	5 (10%)	24 (16%)
Induced vaginal delivery	11 (23%)	44(29%)
CS	32 (67%)	70 (47%)
Forceps delivery	-	12(8%)

Table 11: Distribution of IUGR developing mother by development of post-natal complications.

Complications	Mother of IUGR babies (n=48)	All adolescents mother (n=150)
PPH	11 (23%)	31 (20.7%)
Post-partum Eclampsia (PPE)	10 (20.8%)	14 (9.3%)
Anemic heart failure	1 (2.1%)	2 (1.3%)
Puerperal sepsis	7 (14.6%)	14 (9.3%)
UTI	11(23%)	27 (18%)
RTI	6 (12.5%)	7 (4.7%)
Failure of lactation	6 (12.5%)	8 (5.3%)
Inadequate lactation	18 (37.5%)	45 (30%)

Table 12: Neonatal complications of IUGR babies.

Complications	Mother of IUGR babies (n=48)	All adolescents mother (n=150)
Birth asphyxia	46 (96%)	102 (68%)
Hypoglycemia	40 (83%)	47 (31%)
Respiratory distress syndrome (RDS)	1 (2.1%)	1 (.7%)
Suspected sepsis	4 (8.3%)	4 (2.7%)
Meconium aspiration syndrome (MAS)	0 (0.0%)	0 (0.0%)
Congenital pneumonia	0 (0.0%)	0 (0.0%)
Diarrhoea	3 (6%)	3 (2%)
Convulsion	0 (0.0%)	0 (0.0%)
Neonatal hyperbilirubinemia	4 (8.3%)	5 (3.3%)
Congenital anomalies	0 (0.0%)	0 (0.0%)

DISCUSSION

In Bangladesh there is no official epidemiological data regarding characteristics of adolescent pregnancy complicated with IUGR. The national low birth weight survey of Bangladesh conducted in 2004 indicated a significantly higher rate of LBW and IUGR among teenage mothers, which is in accordance to the current study findings. This survey found that national prevalence of LBW was 36%. 77% of this LBW was due to IUGR. In that survey prevalence of LBW among Adolescent mothers was found 38% which is considerably less than our findings. Many studies have reported the greater risks of IUGR and preterm birth in the younger teenagers.^{4,5} Respondents included in this study were from very poor economic status (average monthly income was 76 USD), high proportion (71%)

were from rural areas with low level of education (38% were illiterate). In addition, inclusion of more mothers those referred in this study place were also at higher risk to develop IUGR. Studies worldwide have examined the effect of socio-economic status (SES) indicators on birth weight and IUGR. After adjusting for all potential confounders, observations point to the fact that teenage pregnancy is more associated with poor socio-economic background.⁶ In our study, 23% adolescent mother found paid employee. It is found that, employee women were more than twice as likely as housewife women to develop IUGR (57% and 24% respectively). On the other hand, regardless of employment status, based on type of work this study found that 22% adolescent mother were involved with strenuous work and among the strenuous worker 61% developed IUGR while among the normal worker, 24% developed IUGR. In developing countries, women are responsible for a wide range of household work and childcare duties, as well as work outside the home. These women are also at highest risk for a poor birth outcome.⁷ Women who had moderate/heavy physical activity in the 1st trimester of pregnancy had a significantly higher odd of giving birth to lower birth weight babies as compared to women who had sedentary physical activity.⁸ Maternal illiteracy shown to be major risk factors for IUGR.⁹ Maternal height has less value than weight or BMI for predicting IUGR. In the other hand, maternal weight gain during gestation predicts IUGR risk better than only pre-pregnancy weight. Women with a low BMI and who do not gain adequate weight are at greatest risk of developing IUGR. In this study no data was available on pre-pregnancy weight thus weight gain could not be assessed. Hence only pre delivery BMI was calculated which has little value to predict IUGR. In the case of pregnant women, BMI of <19.8 kg/m² indicated an undernourished individual, while BMI of 19.8–26 kg/m² was considered to be within the normal range¹⁰. Need of high biologic quality protein such as eggs, milk, meat or other animal sources increases during pregnancy to support continued growth and development in both the foetus and the young pregnant adolescents.¹¹ In the present study, general dietary pattern of adolescent mother found very poor. Moreover, frequency of selected food consumption by adolescent who developed IUGR found more inadequate particularly intake of Meat and milk product. Substantial proportion of IUGR developing adolescent mother did not consume milk (65%), meat (59%) and Fish (19%) once a week. On the other hand, only a small portion adolescent mother take egg and fish regularly 19% and 25% respectively. Vegetable the main sources of vitamin A and iron in the Bangladeshi diet consumed regularly only by 33% of adolescent mother who developed IUGR. Our findings on pattern of food intake differ from other study findings may be due to the socioeconomic difference in dietary intake as found in a study by Islam.¹² This study also reveals that, proportion of IUGR progressively increased with decreased number of ANC taken. For example, since 35% and 37%, IUGR has developed among the mother who had taken one and no

ANC respectively, only 12% of IUGR developed among those mothers who had taken more than two ANC. Some maternal complications found high proportion among the mothers who developed IUGR. Anemia (65%), Oedema (75%), Fetal Distress (56.2%), Oligohydramnios (43.8%) Pre-eclampsia (35.4%) Eclampsia (33.3%) found more common among the mother who developed IUGR babies. Thus, our findings on different obstetrics characteristics among IUGR developing mother were contrasted with some of these study findings. Several studies found anemia to be a common complication in adolescent.¹³ In some study significantly higher incidences were also found for preeclampsia, eclampsia and UTI, fetal distress, among adolescent mother which is accordance with our study.¹⁴⁻¹⁷ Along with their poor nutritional status, Anemia, Oligohydramnios, Preeclampsia, UTI were added reasons for increased number of IUGR to adolescent mothers. In current study, 67% of mothers having IUGR delivered by caesarean section. Unlike our findings, many studies reported that due to better myometrial function, greater connective tissue elasticity and lower cervical compliance adolescent had few induced, operative vaginal deliveries and caesarean deliveries. Our findings differ from them possibly because more than half of our IUGR babies also developed fetal distressed thus to avoid the stress of labor, caesarean section was preferred as mode of delivery. In this study, newborn tended to develop Asphyxia, hypoglycemia hyperbilirubinemia and suspected sepsis more commonly. In this study only fewer proportion of babies were found to develop Respiratory distress, diarrhea that found more commonly among the babies of adolescent mother in other studies.^{18,19} However Meconium Aspiration Syndrome, convulsion, congenital pneumonia and anomalies, were recorded none of the baby in this study. It did not have sufficient power to address rare outcomes.

Limitations

It is a descriptive type of study thus any association or causality cannot be inferred from this study. It is a hospital-based study and therefore the findings cannot a true reflection of the situation in the community. The study place is a tertiary level Hospital. Due to shortage of bed, hospital stay is only a short period, so all-maternal and perinatal mortality and complications cannot be properly estimated.

CONCLUSION

Adolescent pregnancy complicated with IUGR demonstrated higher proportion of maternal complications (severe anemia, pregnancy induced hypertension, pre-eclampsia, eclampsia, oligohydramnios, PPH, PPE, UTI and adverse perinatal outcome (fetal distress, birth asphyxia, hypoglycemia, neonatal hyperbilirubinemia etc.). Simultaneously, some socio demographic factors, which might influence to develop IUGR among adolescent pregnancy, also

observed at higher rate. High rate of adolescent fertility (104 births per 1000 women aged 15-19) is existence in Bangladesh which is a potential threat for developing more IUGR. Thus prevention of early marriage as well as adolescent pregnancy should be given immediate priority through synchronized advocacy communication and social mobilization activity at all the levels. Special attention should be given to the working pregnant adolescent to address significant determinants for developing IUGR like prolonged periods of standing, long working hours and heavy workload and stress during pregnancy. To ascertain the association of these risk factors for developing IUGR among the adolescent mother further population-wide study is needed.

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