

**A study on the incidence and the outcome of teenage pregnancies
and the associated socio-economic factors:
an interim analysis**

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Abstract

Introduction: Teenage pregnancy is known to be associated with adverse pregnancy outcomes for both the mother and her offspring. Knowledge on the socio-economic conditions associated with teenage pregnancy and the short term and intermediate outcomes would provide information useful in prevention and management of teenage pregnancy.

Objective: To describe the prevalence of teenage pregnancy in a low risk population and two identified high risk populations and to identify the associated socio-economic characteristics as well as to assess the incidence of short term and intermediate adverse outcomes in the mother and the offspring.

Methods: The study will be conducted in three phase. The prevalence of teenage pregnancy and associated socio-economic factors would be assessed at three study settings of Ragama, Nuwara Eliya and Puttalam. Second phase would be at Ragama and the pregnancy outcome of the teenage mothers would be compared against a parity matched sample of controls while in phase three a community based follow up study would be done in teenage mothers who delivered at Ragama Hospital two years ago to assess the intermediate outcome of mothers and their offspring.

Here we report the results of the Ragama component of Phase I and a part of the data accumulated for Phase II.

Results: Review of records of 5249 deliveries yielded a teenage pregnancy rate of 4.74% (n=249). Results pertaining to 25 subjects and 50 parity matched controls in phase I and 102 subjects with 179 controls are described here.

The distribution according to religion and ethnicity was not different between the subjects and the controls. The occupations and marital status as well as alcohol consumption of fathers did not demonstrate a difference between the teenage mothers and the controls.

Five percent of subjects were not married while all were married in the control group ($p < 0.05$). There was a significant difference in the educational level between subjects and controls ($p < 0.001$); education beyond Ordinary level was 14% in subjects as compared to 33% among

controls. Partners of subjects were significantly younger ($p < 0.001$), less educated ($p = 0.01$) and earning less ($p < 0.001$) than those of controls.

The unplanned pregnancy rate was much higher among the subjects as compared to the controls (9.4% ($n = 12$) vs. 2.6% ($n = 6$)) ($p = 0.005$).

Antenatal and prenatal complications did not show a clinically important significant difference between the two groups.

Discussion: In this suburban area in close proximity to the capital city, Colombo, the prevalence of teenage pregnancy was nearly 5% while the prevalence rates in the other two study areas planned to be studied is expected to be higher than this as they have known risk factors for a higher prevalence. The subjects and their parity matched controls were very similar in many socio-economic factors and failed to demonstrate some associated risk factors described by other workers; probably due to the small sample size.

Introduction

Teenage pregnancy is known to be associated with many health and social problems which have an impact on both the mother and the baby. It is an important public health problem as it often occurs in the context of poor social support and maternal wellbeing (Smith & Pell 2001).

In 1996, there were 28,271 and teenage pregnancies between the ages of 15-19 years and 139 between the ages of 10-14 years in Sri Lanka (Wijesinghe 2004). These accounted for 8.3% of all births within that year (Wijesinghe 2004). These figures are thought to be an underestimate of the actual incidence as many are not reported due to legal implications in relation to pregnancies under the age of 16 years, which is the legal consenting age for intercourse in Sri Lanka. As age is not routinely checked on hospital admission, a submission of a false age is commonly seen in clinical practice.

In Sri Lanka, 22.2% of maternal deaths due to illegal abortions were in the teenage population in 1996 (Wijesinghe 2004). Though this is not a problem directly related to the effects of pregnancy such data helps us to understand the incidence of pregnancy terminations among this age group that are taking place which are never accounted for in the national statistics. The incidence of teenage pregnancy is thought to be higher among some populations of the country such as the estate sector workers and the Muslim communities where early marriage is common due to cultural influences.

The problem of teenage pregnancy is not unique to developing countries. It is emerging as a major health and a social threat in the developed world as well. In the United States, the teenage pregnancy rate is estimated to be 84.5 per 1000 women aged between 15 and 19 years (Ventura et al. 2004). Nearly 35% of these pregnancies end up in termination whereas the continued pregnancies have shown to be associated with many physical, psychosocial, and educational complications for both the mother and the child (Churchill et al. 2001).

The adverse outcomes associated with teenage pregnancy are low birth weight, preterm delivery, small for gestational age and congenital malformations in the baby and an increased incidence of pregnancy induced hypertension, antepartum haemorrhage and operative deliveries in the mother (Gortzak-Uzman et al. 2001; Abu-Heija, Ali & Al-Dakheil 2002).

Few studies have been done in Sri Lanka to identify the incidence and the outcome of teenage pregnancies. These have demonstrated the incidence to be around 3-4% of all pregnancies (Amarasinghe & Wijerathna 1990; Makuloluwa & Nagimudeen 1990). However, the physical and social implications of the families have not been assessed in these studies.

This study hopes to assess the incidence of teenage pregnancies in some selected demographic areas and to describe the socio-economic characteristics of teenage mothers. The incidence of adverse pregnancy outcome would be described and a follow up assessment will be done on the physical and social status of the mother and the baby two years after child birth. Here we describe an interim analysis.

Method

Study design

The study comprises three phases. Phase I comprises a prevalence study done in Ragama as a low risk population and in Nuwara Eliya and Puttalam as high risk populations. Nuwara Eliya represents a population with a large proportion of estate workers and Puttalam district has a high Muslim representation. Phase II is a retrospective study of pregnancy outcome of teenage mothers delivering at Colombo North Teaching Hospital, Ragama. Phase III is a follow up study of mothers and offspring of teenage mothers who had delivered two years ago at the Colombo North Teaching Hospital, Ragama.

For all three phases a parity matched control group within the ages of 20-30 were included.

Here we report the results of the Ragama component of Phase I with data of Phase II and III.

Study setting

The completed part of the phase I was carried out at Colombo North Teaching Hospital in the Gampaha district and is considered a low risk population. The same methodology is to be adopted in the Nuwara Eliya and Puttalam districts, which are considered high risk populations. Data collection for the Phase I was carried out at the antenatal clinic of the North Colombo

Teaching Hospital. In the Phase II of the study, data collection was done in the obstetric wards of the Colombo North Teaching Hospital, Ragama while Phase III was carried out in the community.

Main outcome measures

First phase of the study:

The age of the subject at commencement of the pregnancy, ethnicity, religion, marital status, education level of the subject and the partner, occupations of the subject and partner, monthly household income, whether the pregnancy was planned or unintended and the height and weight of the subject.

Second phase of the study:

Height and weight of the mother, POA at delivery, antenatal complications, intrapartum complications, mode of delivery, postnatal complications of the mother, birth weight of the baby, meconium at birth, neonatal admission to SCBU and the duration of hospital stay after delivery.

Third phase of the study:

Household income, occupation of the mother, pregnancies following the index pregnancy, duration of exclusive breast feeding, partner substance abuse, physical abuse by the husband, immunization status of the baby, weight gain and the developmental milestones of the baby.

Sample size and the duration

500 pregnant mothers were interviewed for the first phase of the study in the Gampaha district. 25 subjects were identified among them and were recruited for the study with two parity matched controls. A similar number of clinic attendees are to be interviewed from Nuwara Eliya and Puttalam districts. One hundred and sixty subjects with 320 parity matched controls were included in the second phase of the study. The follow up in the third part of the study included 50 subjects and 100 parity matched controls.

Ethical considerations

Informed written consent is obtained from all participants in the second and third phases of the study. There were no major ethical considerations encountered in the study proposal. The data obtained for the research project with regard to the age and other social circumstances of the subjects were not used for any other purpose. The data is kept securely and only the investigators have access to this information. The study proposal was submitted to the ethical review committee of the faculty of medicine and approval was obtained prior to commencement of the study.

Results

First phase of the study

Age category	Subjects (n=25)	Controls (n=50)
≤ 15	2(8)	
≤ 17	6(24)	
≤ 19	17(68)	
≤ 22		22(44)
≤ 24		10(20)
≤ 26		7(14)
≤ 28		5(10)
≤ 30		6(12)
Total	25	50

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In the first phase of the study, subjects were recruited from Ragama. We describe here the results pertaining to 25 subjects and 50 parity matched controls. This sample was obtained after interview of 500 antenatal clinic attendees. The prevalence of teenage pregnancy was 5% in the population studied.

The mean(SD) age of the teenage mothers was 18.24(1.3) years with a range between 14 to 19 years while the controls were between 20 to 30 years with a mean(SD) age of 24.8(3.8) years. The distribution of the study sample according to age is shown in table 1.

The main ethnicity of the study population was Sinhalese while the main religion was Buddhism. There was no difference observed in ethnicity and the religion between the subjects and the controls. The comparison between subjects and the controls according to ethnicity and the religion is shown in table 2.

Table 2. Comparison between subjects and controls by ethnicity and religion; number (%)			
	Subjects (n = 25)	Controls (n = 50)	Sig.
Nationality			
Sinhalese	25(100)	40(80)	Fisher's exact test
Tamil		5(10)	P > 0.05
Muslim		5(10)	
Religion			
Buddhist	20(80)	31(62)	Fisher's exact test
Catholic	4(16)	12(24)	P > 0.05
Islam		2(4)	
Hindu		3(6)	
Christian	1(4)	2(4)	

There was no significant difference between the subjects and the controls observed in the main socio-economic characteristics that were assessed. The comparison of these characteristics is shown in table 3.

Table3. Comparison of main socio-economic characteristics between the subjects and the controls			
Socio-economic factor	Subjects (n=25)	Controls (n=50)	Sig
Education level; no(%)			
Up to primary	1(4)	3(6)	P > 0.05
Up to O. level	21(84)	31(62)	
Up to A. level	3(12)	16(32)	
Type of occupation; no(%)			
Unemployed	23(92)	42(84)	P > 0.05
Non-skilled	2(8)	7(14)	
Skilled		1(2)	
Education level of the partner; no(%)			
No schooling		1(2)	P > 0.05
Up to primary		1(2)	
Up to O. level	22(88)	37(74)	
Up to A. level	3(12)	9(18)	
Beyond A. level		1(2)	
Partner's type of occupation; no(%)			
Non-skilled	23(92)	45(90)	P > 0.05
Skilled	2(8)	5(10)	

Housing; no(%)			
Own a house	6(24)	11(22)	P > 0.05
Living on rent	4(16)	10(20)	
Living with parents	15(60)	29(58)	
Partner's alcohol use; no(%)			
Non user	23(92)	44(88)	P > 0.05
< once a week	2(8)	4(8)	
> once a week		2(4)	
Partner's smoking pattern; no(%)			
Non smoker	21(84)	46(92)	P > 0.05
Smoker	4(16)	4(8)	
Total household income(Rs); mean(SD)	36000(1414)	34188(1231)	P > 0.05
O. level - GCE Ordinary level examination A. level - GCE Advanced level examination			

Second phase of the study

For this phase of the study 160 subjects and 320 parity matched controls were included from mothers who delivered at the North Colombo Teaching hospital, Ragama.

The mean(SD) age of the subjects was 17.7 (3.4) while it was 23.79(3.04) for the controls. There was no difference observed in the presence of known risk factors for teenage pregnancy such as the ethnicity, religion, the marital status of the parents, the occupations of the parents and the alcohol usage of the farther. The presence of these risk factors among the subjects and the controls is shown in table 4.

Table4. Comparison of risk factors among the subjects and the controls; number (%)			
Risk factor	Subjects n=160	Controls n=320	Sig.
Ethnicity			P > 0.05
Sinhalese	141(88.1)	295(92.1)	
Tamil	13(8.1)	17(5.3)	
Muslim	6(3.7)	6(1.8)	
Other		2(0.6)	
Religion			P > 0.05
Buddhist	96(60.0)	207(64.6)	
Catholic	46(28.7)	91(28.4)	
Islam	5(3.1)	6(1.8)	
Hindu	8(5.0)	10(3.1)	
Christian	5(3.1)		
Marital status of parents			P > 0.05
Married	140(87.5)	274(85.6)	
Widowed	15(9.35)	43(13.4)	
Living separated	2(1.2)	2(0.6)	
Divorced	3(1.8)	1(0.3)	

Father's occupation type			
Unemployed	5(3.1)	24(7.5)	P > 0.05
Non-skilled	141(88.1)	271(84.6)	
Skilled	14(8.7)	21(6.5)	
Professional		4(1.2)	
Mother's occupation type			
Unemployed	115(71.8)	237(74.0)	P > 0.05
Non-skilled	43(26.8)	78(24.3)	
Skilled	2(1.2)	4(1.2)	
Professional		1(0.3)	
Alcohol usage of father			
Non user	82(51.2)	148(46.2)	P > 0.05
< once a week	35(21.8)	91(28.4)	
> Once a week	30(18.7)	51(15.9)	
Daily	13(8.1)	30(9.3)	

The socio-economic status of the subjects significantly differed from that of the controls with regard to marital status, education level and occupation of the pregnant mothers as well as for the education level, occupation of the partner and the total household income. The partners of the teenage mothers had a higher prevalence of alcohol consumption and smoking than that of the controls. The socio-economic factors assessed between the subject and the controls are shown in table 5.

Table 5. Comparison between subjects and controls with regard to socio-economic factors.			
Socio-economic factor	Subjects n = 160	Controls n = 320	Sig.
Marital status; no(%)			
Married	142(88.7)	316(98.7)	P = 0.0001
Living out of wedlock	7(4.3)	1(0.3)	
Living separated	1(0.6)	0	
Divorced	10(6.25)	3(0.9)	
Education level; no(%)			
No schooling	1(0.6)	0	P = 0.0001
Up to primary	14(8.7)	12(3.7)	
Up to O. level	137(85.6)	208(65.0)	
Up to A. level	8(5)	94(29.3)	
Beyond A. level		6(1.8)	
Type of occupation			
Unemployed	152(95.0)	247(77.1)	P = 0.0001
Non-skilled	6(3.7)	57(17.8)	
Skilled	2(1.2)	15(4.6)	
Professional		1(0.3)	
Partner's education; no(%)			
No schooling	2(1.25)	1(0.3)	P = 0.001
Up to primary	18(11.2)	18(5.6)	
Up to O. level	118(73.7)	202(63.1)	
Up to A. level	21(13.1)	90(28.1)	
Beyond A. level	1(0.6)	9(2.8)	

Partner's occupation type; no(%)			
Non-skilled	120(75.0)	218(68.1)	P = 0.001
Skilled	40(25.0)	99(30.9)	
Professional		3(0.9)	
Alcohol usage of partner; no(%)			
Non user	120(75.0)	232(72.5)	P = 0.03
< once a week	31(19.3)	84(26.2)	
> Once a week	8(5.0)	4(1.2)	
Daily	1(0.6)	0	
Smoking habits of partner; no(%)			
Non smoker	111(69.3)	257(80.3)	P = 0.03
Less than daily	31(19.3)	38(11.8)	
Daily	18(11.2)	25(7.8)	
Housing; no(%)			
Own a house	44(27.5)	112(35.0)	P > 0.05
Lives on rent	15(9.3)	38(11.8)	
Lives with parents	101(63.1)	170(53.1)	
Monthly household income(Rs); mean(SD)	15269(8603)	19967(9200)	P = 0.0001
O. level - GCE Ordinary level examination A. level - GCE Advanced level examination			

The rate of unintended pregnancy was significantly higher among the subjects compared to the controls (51.8%(n=83) vs. 26.5% (n=85); $P < 0.0001$). The recognised complications of teenage pregnancy were not significantly higher among the subjects in this study population. Though birth weight of the neonates of the teenage mothers was significantly lower than that of the controls the difference was not a clinically significant difference. Furthermore, the incidence of low birth weight failed to show a difference between the two groups. A comparison of the main pregnancy complications and neonatal outcome between the two groups is shown in table 6.

Table 6. Comparison of pregnancy and neonatal complications between the subjects and the controls.			
Pregnancy complication	Subjects N=160	Controls N=320	Sig.
Pregnancy induced abortion; no(%)	6(3.7)	19(5.9)	P > 0.05
Gestational diabetes mellitus; no(%)	2(1.25)	9(2.8)	P > 0.05
Antepartum haemorrhage; no(%)	3(1.8)	9(2.8)	P > 0.05
Mode of delivery; no(%)			P > 0.05
Vaginal del.	142(88.7)	268(83.7)	
Instrument. del.	3(1.8)	2(0.6)	
LSCS	15(9.3)	50(15.6)	
Prematurity; no(%)	11(6.8)	23(7.1)	P > 0.05
Meconium at delivery; no(%)	20(12.5)	31(9.6)	P > 0.05
Birth weight; mean(SD)	2799(404)	2924(473)	P = 0.007
Low birth weight; no(%)	30(18.7)	52(16.2)	P > 0.05
Admission to special care baby unit; no(%)	8(5.0)	20(6.2)	P > 0.05
LSCS - Lower segment caesarean section			

Third phase of the study

In the third phase of the study 50 teenage mothers who have delivered at the North Colombo Teaching hospital two years ago were included as subjects. Two parity matched controls for each subject were also recruited for the study from mothers between 20-30 years of age who have delivered two years ago at the same institution. At follow up after 2 years from birth there the outcome of the offspring was similar in subjects as well as in the controls with regard to immunization, reaching development milestones, skin infections, dental hygiene and number of hospital admissions. However the socio-economic factors of the household the

child is living were significantly less favourable among the subjects compared to the controls. A comparison of outcome of the offspring and the socio-economic conditions of the household are shown in tables 7 & 8.

Table 7. Comparison of outcome in offspring between teenage pregnancies and the controls

Factors in the offspring	Subjects n = 50	Controls n = 100	Sig.
Age appropriate immunization; no(%)	46(92.0)	96(96.0)	P > 0.05
Delayed milestones; no(%)	48(96.0)	95(95.0)	P > 0.05
Skin infection; no(%)	8 (16.0)	12(12.0)	P > 0.05
Dental disease; no(%)	4 (8.0)	7 (7.0)	P > 0.05
Number of hospital admissions; mean(SD)	1.37(0.8)	1.17(0.6)	P > 0.05

Table 8. Comparison of socio-economic status of the household the offspring live in at two year follow up

Socio-economic factor	Subjects n = 50	Controls n = 100	Sig.
Parents' marital status; no(%)			P > 0.05
Married	48(96)	100(100)	
Living separated	2(4)		
Mother's education level; no(%)			P < 0.01
Up to primary	6(12)	2(2)	
Up to O. level	42(84)	70(70)	
Up to A. level	2(4)	24(24)	
Beyond A. level	8(5)	4(4)	
Continued			

Type of occupation of mother; no(%)			
Unemployed	41(82)	73(73)	P > 0.05
Non-skilled	7(14)	14(14)	
Skilled	2(4)	12(12)	
Professional		1(1)	
Father's education level; no(%)†			
No schooling	0	0	P = 0.02
Up to primary	12(25.0)	8(8)	
Up to O. level	34(70.8)	78(78)	
Up to A. level	2(4.1)	12(12)	
Beyond A. level	0	2(2)	
Alcohol usage of father; no(%)†			
Non user	23(46.0)	44(44)	P = 0.04
< once a week	24(50.0)	37(37)	
> Once a week	0	14(14)	
Daily	1(2.1)	5(5)	
Smoking habits of father; no(%)†	31(64)	45(45)	p = 0.01
Monthly household income(Rs); mean(SD)	12358(9328)	18242(7683)	P = 0.01
† n = 48 O. level - GCE Ordinary level examination. A. level - GCE Advanced level examination			

Discussion

This study was carried out in a suburban area in close proximity to the capital city, Colombo. The prevalence of teenage pregnancy was nearly 5%. The prevalence rates in the other two study areas planned to be studied is expected to be higher than this as they have known risk factors for a higher prevalence. Though a minority, some subjects were below the legal age limit for consent for sexual activity as described in the Sri Lankan penal code.

The subjects and their parity matched controls were very similar in many socio-economic factors and failed to demonstrate some associated risk factors described by other workers such as marital status of the parents, occupation of the parents and alcohol usage of the father. Over five percent of the subjects were not married at the time of recruitment thus exposing them to a higher risk of broken families and becoming a single parent in the future. The significantly low level of education of both the study subject and the partner will also have a negative effect in theirs as well as the offspring's future. Some evidence of this was shown in the low household income of the subjects compared to the controls.

Majority of teenage pregnancies were unplanned and the rate of unplanned pregnancy was significantly higher among these teenage mothers compared to the controls. This demonstrates the need of contraceptive advice among the younger age groups.

The data available failed to demonstrate any significant association between the teenage pregnancy and many known negative pregnancy outcomes. The birth weight of the baby showed a statistically significant but clinically not significant difference. However, the socio-economic status of the households were significantly lower among the subjects compared to controls in both phase II of the study during pregnancy as well as two years after childbirth as shown in phase III of the study. This may expose the mother and the offspring to many social problems in years to come thus highlighting the need for increased social support in this population.

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