Risk factors for pregnancy among adolescent girls in Ecuador's Amazon basin: a case-control study

Isabel Goicolea,[1,2] *Marianne Wulff,*[2] *Ann Öhman,*[1,3] *and Miguel San Sebastian*[1]

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ABSTRACT

Objective. *To examine risk factors for pregnancy among adolescent girls in the Amazon basin of Ecuador.*

Methods. *A matched case-control study with cases and controls identified within a community-based demographic and health survey was conducted in Orellana, Ecuador, from May to November 2006. A questionnaire focused on socioeconomic status, family structure, education, reproductive health, and childhood-adolescent trauma was applied. Conditional logistic regression was used to adjust for potential confounders.*

Results. *Respondents included 140 cases and 262 controls. Factors associated with increased risk of adolescent pregnancies through multivariate analysis were: sexual abuse during childhood-adolescence (odds ratio (OR) 3.06, 95% confidence interval (CI) 1.08–8.68); early sexual debut (OR 8.51, 95% CI 1.12–64.90); experiencing periods without mother and father (OR 10.67, 95% CI 2.67–42.63); and living in a very poor household (OR 15.23, 95% CI 1.43–162.45). Another two factors were statistically associated in the bivariate analysis: being married or in a consensual union (OR 44.34, 95% CI 17.85–142.16) and not being enrolled in school at the time of the interview (OR 6.31, 95% CI 3.70–11.27). For a subsample of sexually initiated adolescents, "non-use of contraception during first sexual intercourse" was also found to be a risk factor (OR 4.30, 95% CI 1.33–13.90).*

Conclusion. *The study found that early sexual debut, non-use of contraception during first sexual intercourse, living in a very poor household, having suffered from sexual abuse during childhood-adolescence, and family disruption (living extended periods of life without both parents) were associated with adolescent pregnancy in Orellana.*

Key words Pregnancy in adolescence; sexual violence; contraception; family; risk factors; Ecuador.

[1] Department of Public Health and Clinical Medicine, Epidemiology and Public Health, Umeå University, Umeå, Sweden. Send correspondence and reprint requests to: Isabel Goicolea, Department of Public Health and Clinical Medicine, Epidemiology and Public Health, Umeå University, 90185 Umeå, Sweden; telephone/fax: +59 36 288-2117; e-mail: isabel.goicolea@obgyn.umu.se, isagoiko@yahoo.es

[2] Department of Clinical Sciences, Obstetrics and Gynecology, Umeå University, Umeå, Sweden.

[3] Umeå Centre for Gender Studies, Umeå University, Umeå, Sweden.

In the Andean region of South America, 1.5 million out of 7 million adolescent girls were pregnant during 2004. In Ecuador, the adolescent fertility rate is the highest in the region and has increased from 84 per 1 000 in 1989 to 100 in 2004. Of all Ecuadorian women age 15 to 19, 20% get pregnant before age 20. Inequalities between adolescent girls of different educational levels, geographical regions, and household incomes are prominent. Of illiterate adolescents, 43% have been pregnant, compared to 11% with secondary education. Geographically, the Amazon basin shows the highest adolescent fertility rates in the country (121 per 1 000) (1).

Worldwide, early childbearing is associated with higher risk of adverse reproductive outcomes and, among the young-

est mothers and their newborns, increased maternal and infant mortality (2–5). Adolescent pregnancy contributes to the perpetuation of the poverty cycle by placing these girls at higher risk for low educational and occupational attainment and low socioeconomic status (1, 5–7). Children born to teenage mothers experience more risk of abuse and neglect and have more behavioral problems (2, 8). However, early pregnancy is also perceived as a rite of passage—a pathway to adulthood that might bring positive consequences—and thus is desired in some contexts (4, 8–10). It may also be seen as an escape from abusive families (4, 8–11).

There is an ample literature on risk factors associated with pregnancy among adolescent girls. In Latin America, risk factors include sexual and reproductive issues such as poor contraceptive knowledge and use, and early sexual debut (6, 12, 13). Family disruption and low levels of communication within the family are also shown to be risk factors (6, 12, 14–16), along with poor educational indicators and low socioeconomic status (2, 6, 12, 15–17). Associated personal characteristics include behavioral problems, depression, low self-esteem, and poor self-control. Intimate partner violence (IPV) and past episodes of sexual abuse are also determinants (6, 11).

In Ecuador, a national action plan for adolescent pregnancy prevention was established in 2007. The plan uses a rights-based approach and is based on the assumption that in order for adolescents to exercise their reproductive rights they not only need access to a network of services but also must be empowered to take control of their sexuality. A primary issue to be addressed by the plan is the urgent need for information on the most vulnerable and neglected groups: the youngest adolescents; rural and indigenous groups; those living in isolated areas of the country; and migrants, the displaced, and refugees (1).

To the authors' knowledge, only two case-control studies regarding risk factors for pregnancy among adolescent girls have been published from Ecuador to date: one from the Enrique C. Sotomayor Maternity Hospital in Guayaquil (18), and one from Quito (16), both major cities with a population of more than 2 million. The Guayaquil study compared pregnant adolescent girls younger than 16 with pregnant women aged 20–30 years. Early sexual initiation, poor knowledge of reproductive health, and family disruption were found to be associated with pregnancy before age 16. The Quito study compared pregnant adolescent girls at the maternity ward with non-pregnant adolescent girls from nearby schools. Parental separation, poor communication with parents, low family education, lack of authority-sharing between parents, and low levels of cohesion and connectedness were found to be associated with adolescent pregnancies in this study. However, Ecuador's diversity makes it difficult to generalize these results to rural settings or to isolated areas such as the Amazon rainforest. The studies also focused on health facilities, selecting adolescents attending prenatal and antenatal care, and thus provided a different perspective than that obtained from adolescents selected directly from the community, especially in areas where rates of deliveries at health facilities are low.

The objective of the current study was to examine risk factors for pregnancy among adolescent girls in the Amazon basin of Ecuador (Orellana).

MATERIALS AND METHODS

Study area

The study took place in Orellana, an Ecuadorian province in the Amazon basin with 103 032 inhabitants and 22 500 km^2 of rainforest, and a mainly rural population (70%) with a significant indigenous subpopulation (30.4%). The population is young, with 47.8% less than 15 years old and 26.8% adolescents (10–19 years old) (19).

The province is divided into four counties comprising two small towns: the capital (Coca), with approximately 20 000 inhabitants, and Sachas, with 7 000 inhabitants. In the rural areas, people usually live in small communities that range, on average, from 300–500 people.

Overall life expectancy in Orellana is five years less than the national mean (61 vs. 65 for men, and 67 vs. 73 for women). Educational levels are also much lower than in other regions of the country, and inequities between urban and rural areas as well as ethnic groups have been found. Reproductive health indicators for the area are no exception to this trend. Unwanted pregnancies account for an estimated 34% of all pregnancies, increasing to an estimated 43% among indigenous women. The mean number of children for women 40–44 years old is 6.2 (vs. 3.8 nationwide), with differences between rural and urban areas and according to ethnic origin (e.g., 5.0 for urban women and 7.4 for indigenous women). Adolescent pregnancies are common: 39.6% of girls aged 15–19 years are or have been pregnant, a rate twice as high as the national prevalence (19, 20).

Study design

A matched case-control design was implemented with a 1:2 ratio. A case was defined as any female adolescent (aged 10–19 years, for this study, as per World Health Organization (WHO) criteria) living in Orellana who was pregnant at the time of the interview or had been pregnant for the first time during the previous two years. These criteria were used to minimize recall bias. Controls were defined as girls in adolescence (at the time of the interview) who had never been pregnant. Cases and controls were matched for community of residence and age (plus/minus two years) at pregnancy.

The required sample size was determined to be 100 cases and 200 controls, based on an expected prevalence of exposure in the control group of 13% and an odds ratio (OR) to detect of 2.5, with a confidence interval (CI) of 95% and a power of 0.80. Prevalence of exposure among the controls was based on prevalence of witnessing domestic violence among controls from Zelaya's research on adolescent pregnancies in Leon, Nicaragua, as there were no available data from Ecuador (21). Cases and controls were selected from a community-based demographic and health survey that gathered information from a representative sample of 1 631 households from the four counties of Orellana Province. Information on reproductive characteristics permitted the identification of potential participants for the study. Because information on cases and controls was collected throughout the entire study period (May–November 2006), the number of cases and controls exceeded the required sample size. Data were collected from 144 cases and 271 controls.

Data collection and instruments

Survey data were collected by four local, trained female field-workers who visited each selected survey unit (household) and administered the question-

naire with the female head of household. All women 10–44 years old living in the household were asked about their reproductive history. When a case was detected, permission to administer the questionnaire was solicited from both the child-adolescent and any parents living with her. If more than one case/control was identified in a household (as occurred in one survey unit), all were deemed eligible for participation and any additional matched controls required were sought by the respective field-worker when he/she continued the survey in the next household.

The questionnaire was a modified version of the Nicaraguan Adolescent Reproductive Health Survey (*Investigación en Salud Reproductiva de Adolescents*) and was conducted in Spanish. The survey questions, which were pilot-tested among urban and indigenous adolescent girls, gathered information about risk factors for adolescent pregnancy, including socio-demographics (socioeconomic status; family structure and living arrangements; and education, including school enrollment, barriers, satisfaction, and parental encouragement); sexual and reproductive health (receipt of sex education, age at first sexual intercourse, mother pregnant during adolescence, pregnancy among other adolescent family members); and childhood-adolescent trauma (defined below).

Childhood-adolescent trauma was assessed by the Adverse Childhood Experiences (ACE) questionnaire, a survey instrument used by the U.S. Centers for Disease Control and Prevention (CDC) in an ongoing study analyzing relationships between childhood-adolescent trauma and health and behavioral events later in life (ACE study) (22) by measuring the occurrence of eight harmful incidents during an individual's first 18 years: physical abuse, emotional abuse, sexual abuse, alcohol and/or drug abuse in the family, incarceration of household member, family mental illness, mother suffering IPV, and parental separation.

Sexual abuse was measured by the question: "Has an adult or person at least 5 years older than you ever touched or fondled you in a sexual way, and/or made you touch their body in a sexual way, and/or attempted oral, anal, or vaginal intercourse with you, and/or actually had oral, anal, or vaginal intercourse with you?" The ACE questionnaire has been used by other researchers to evaluate the association between adverse events during childhood-adolescence and adolescent pregnancy (23–25). Other family disruption variables studied were father's and mother's absence during a girl's life. Absence was defined as "spending periods of one year or more without father and/or mother." Concerning educational variables, for adolescent girls, exposure was defined as not having initiated secondary education at the time of the interview. For father's and mother's education, exposure was defined as "less than secondary education completed." A socioeconomic index was constructed by assigning values to materials used in the construction of the home, and sources for water and sanitation. Questions were based on the Ecuadorian National Census Questionnaire. The maximum score per household was 20, and the minimum was 5. Values were grouped into three categories (tertiles).

After explaining the aims of the study and obtaining permission from the adolescent girl, and her parents, if applicable (i.e., if they lived in the same household), an appropriate interviewing area (one that ensured privacy) was found. Only the participant and the field-worker were present during the questionnaire interview. Confidentiality was assured and participants' names were not requested or recorded. Participants were also assured that they could stop or withdraw from the interview at any time. The questionnaire interview lasted approximately 20 minutes. Field-workers read the questions to the girls and recorded their answers. For questions regarding adverse events during childhood-adolescence, participants were offered the option of reading the questions and recording the answers themselves. Only a few did so. Adolescent girls who reported adverse events related to violence were given information about a women's health center that provides psychological, social, medical, and legal advice (Jambi Wasi, in Coca).

Data were entered and analyzed using Epi Info for Windows version 3.4 (CDC, Atlanta, GA, USA). Bivariate analysis was performed first, estimating ORs and 95% CIs. Variables that showed statistically significant associations ($p < 0.05$) were further analyzed using conditional logistic regression (26).

Although there was no local ethics committee, several actions were taken to ensure compliance with ethical research principles. These included obtaining approval of the study design from provincial authorities; informing community leaders of the upcoming survey, and soliciting their cooperation; and presenting survey results to local authorities and young community leaders.

RESULTS

Twenty-five cases and 45 controls declined to participate. The final sample for analysis consisted of 140 cases and 262 controls, for a total of 402 respondents (four cases and nine controls were excluded due to incorrect matching). The frequency of missing answers in the questionnaire was low, and no particular question was identified as difficult to answer.

Mean age of cases and controls was 17.0 years (standard deviation (SD) 1.49) and 16.5 years (SD 1.59), respectively. Mean age of cases when pregnancy occurred was 16.5 years (SD 1.44), and half (49.6%) lived in rural areas. Regarding ethnic origin, 283 (72.6%) were non-indigenous (mestizo) and 107 (27.4%) were indigenous. Due to ethnic settlement patterns, no differences by ethnic origin were found between cases and controls (i.e., adjusting for place of residence also meant, in effect, adjusting for ethnicity). Most cases (103, or 73.6%) were married or in a formal union, whereas the majority of controls (243, or 93.5%) were single (data not shown).

Tables 1 to 3 present factors associated with pregnancy among adolescent girls. Cases were significantly less likely than controls to report receiving sex education in secondary school (100 vs. 207 subjects; OR 2.5, 95% CI 1.17–5.53). Adolescent girls experiencing pregnancy were also significantly more likely than controls to live in a very poor household, have a relative who got pregnant during adolescence, have lived periods of their life without two parents, have sexual intercourse before 15, and have suffered sexual abuse during childhood-adolescence.

In the multivariate analysis (Table 4), four factors remained statistically significant: sexual abuse during childhood-adolescence (OR 3.06, 95% CI 1.08–8.68); early sexual debut (before age 15) (OR 8.51, 95% CI 1.12–64.90); living in a very poor household (OR 15.23, 95% CI 1.43–162.45); and experiencing life periods of a year or longer without a mother and father (OR 10.67, 95% CI 2.67–42.63).

Two additional factors were statistically associated with adolescent pregnancies, namely being married or being in a union

TABLE 1. Bivariate analysis of selected socio-demographic indicators as risk factors for pregnancy among adolescent women, Orellana, Ecuador, 2006

Risk factor	Cases (n = 140)[a]		Controls (n = 262)[a]		OR[b]	95% CI[c] (range)
	No.	%	No.	%		
Socioeconomic status						
Highest tertile	9	6.9	39	15.5	1	
Middle tertile	73	55.7	151	59.9	2.74	1.09–6.91
Lowest tertile	49	37.4	62	24.6	6.06	2.05–17.97
Adolescent's education						
Secondary school	110	79.7	215	83.3	1	
No secondary school	28	20.3	43	16.7	1.23	0.71–2.15
School satisfaction						
Yes	87	64.0	171	66.5	1	
No	49	36.0	86	33.5	1.07	0.68–1.71
Mother's education						
Secondary school	14	11.8	44	18.8	1	
No secondary school	105	88.2	190	81.2	1.75	0.87–3.67
Father's education						
Secondary school	15	12.9	46	20.4	1	
No secondary school	101	87.1	179	79.6	1.77	0.85–3.85
Parents encourage education						
Yes	125	90.6	233	91.0	1	
No	13	9.4	23	9.0	1.08	0.49–2.27
Parents' absence						
Both parents present	34	34.7	156	69.0	1	
Only one parent present	6	6.1	35	15.5	0.55	0.19–1.62
Both parents absent	58	59.2	35	15.5	9.85	4.39–22.09

[a] Totals for some variables may differ due to missing values.
[b] OR = odds ratio.
[c] CI = confidence interval.

(OR 44.34, 95% CI 17.85–142.16), and not being enrolled in school at the time of the interview (OR 6.31, 95% CI 3.70–11.27). For those 80 cases (58.0%) that were not currently studying, the main reasons for leaving school were pregnancy (33, or 41.3%) and marriage (29, or 36.3%). However, these two factors cannot be labeled as true risk factors because the questionnaire did not ascertain whether they were present prior to the pregnancy.

To compare factors present only among sexually initiated girls, a subsample was selected. For the subsample, only cases with at least one matched control and controls with at least one matched case (both reporting sexual debut) were included. The small size of this group (47 cases and 52 matched controls) did not allow for powerful analysis. In the multivariate analysis, among adolescent girls who had initiated sexual activity, those who did not use contraception at first sexual intercourse were at higher risk of experiencing pregnancy before 19 (OR 4.30, 95% CI 1.33–13.90).

DISCUSSION

Adolescent pregnancy prevention research and programs predominantly focus on factors controlled by the adolescent girl. However, the most important factors linked to early pregnancy in this study—sexual abuse, parental absence, and poverty—depend more on structural, social, and cultural forces than on the will of the individual girl.

A link between past and current sexual abuse and adolescent pregnancy has also been found in other studies, including a recent one from Central America that shows that childhood-adolescent sexual abuse placed girls at higher risk of experiencing an adolescence pregnancy (11, 24, 27, 28). Some researchers attribute the link between childhood-adolescent sexual abuse and young girls' pregnancy to the effect of early and abusive sexualization on female adolescents' sexual behavior (11). However, others maintain that existing evidence is still not conclusive (29). In the current study, the association remains significant, even when early sexual debut (a potential confounding factor) enters the model.

Measurement of childhood-adolescent sexual abuse is a controversial issue (29, 30). Several factors contribute to the debate surrounding this topic. First, the variety of definitions of sexual abuse makes comparisons and generalizations difficult (31–33). For example, the definition of abuse used in the current research, which is taken from the ACE study, measures not only physical violence, overt coercion, or regret from the child-adolescent girl, but also the potential power imbalance (according to the age gap) between the girl and the adult who sought gratification from the sexual act. This method has been recommended by other authors who emphasize the risk of assessing child-adolescent consent to sexual relations using adult criteria that do not consider the potential effects of an age difference between the sexual abuse perpetrator and victim (30, 32–34). However, the ACE definition may be too stringent for some social and cultural contexts (e.g., Ecuador) where certain behaviors categorized as childhood-adolescent sexual abuse using the ACE criteria remain common and generally accepted, such as early union (marriage or cohabitation) between a female child and an adult, which the United Nations Children's Fund (UNICEF) characterizes as the most prevalent form of child-adolescent sexual abuse. However, the fact that a behavior is frequent and not generally perceived as negative in a particular setting does not justify the use of a more "relaxed definition," just as sensitivity to local culture does not justify failure to enforce policies supporting adolescent girls' protection framework (30). On the other hand, the ACE definition could be perceived as too narrow due to its exclusion of non-contact sexual abuse.

The observed association between childhood-adolescent sexual abuse and adolescent pregnancies has two main implications for policy-makers and health providers. First, adequate management of girl victims of sexual abuse must include efforts to prevent future high-risk sexual behavior and early pregnancy. Second, since adolescent pregnancy might be a marker for past abuse, health workers attending pregnant adolescent girls should make use of the opportunity to screen for it and provide appropriate referrals.

The association noted in this study between family structural factors and adolescent pregnancy, as well as other sexual health risk behaviors, has also been demonstrated in other research, including a study from Quito, Ecuador (14, 16, 35, 36). It should be noted, however, that these types of risk factors often stem from social and cultural conditions beyond the influence of adolescent girls and

TABLE 2. Bivariate analysis of adverse events during childhood-adolescence as risk factors for pregnancy among adolescent women, Orellana, Ecuador, 2006

Risk factor	Cases (n = 140)[a] No.	Cases (n = 140)[a] %	Controls (n = 262)[a] No.	Controls (n = 262)[a] %	OR[b]	95% CI[c] (range)
ACE score[d]						
0–3	96	71.6	180	72.0	1	
4–8	38	28.4	70	28.0	1.01	0.63–1.61
Physical abuse						
No	72	52.2	144	55.8	1	
Yes	66	47.8	11	44.2	1.14	0.76–1.71
Emotional abuse						
No	99	71.7	168	64.9	1	
Yes	39	28.3	91	35.1	0.75	0.47–1.17
Sexual abuse						
No	62	44.3	218	83.2	1	
Yes	78	55.7	44	16.8	6.63	3.89–11.83
Adolescent's mother experiencing IPV[e]						
No	75	54.3	160	61.8	1	
Yes	63	45.7	99	38.2	1.48	0.95–2.33
Parental divorce						
No	100	73.5	184	71.6	1	
Yes	36	26.5	73	28.4	0.89	0.55–1.43
Mental illness within family						
No	108	78.3	213	82.6	1	
Yes	30	21.7	45	17.4	1.33	0.76–2.32
Substance/alcohol abuse within family						
No	93	67.9	175	67.8	1	
Yes	44	32.1	83	32.2	1.03	0.65–1.61
History of incarceration within family						
No	116	84.7	200	78.1	1	
Yes	21	15.3	56	21.9	0.63	0.35–1.11

[a] Totals for some variables may differ due to missing values.
[b] OR = odds ratio.
[c] CI = confidence interval.
[d] Total number of reported adverse childhood experiences based on criteria of ACE study (U.S. Centers for Disease Control and Prevention, 2008).
[e] IPV = intimate partner violence.

TABLE 3. Bivariate analysis of sexual and reproductive health variables as risk factors for pregnancy among adolescent women, Orellana, Ecuador, 2006

Risk factor	Cases (n = 140)[a] No.	Cases (n = 140)[a] %	Controls (n = 262)[a] No.	Controls (n = 262)[a] %	OR[b]	95% CI[c] (range)
Family member experiencing adolescent pregnancy						
No	90	66.2	200	79.1	1	
Yes	46	33.8	53	20.9	1.92	1.18–3.12
Adolescent's mother pregnant during adolescence						
No	36	29.8	81	33.2	1	
Yes	85	70.2	163	66.8	1.22	0.75–2.01
Sex education at primary school						
Yes	47	34.1	73	28.5	1	
No	91	65.9	183	71.5	1.27	0.81–2.01
Sex education at secondary school						
Yes	100	84.0	207	90.8	1	
No	19	16.0	21	9.2	2.5	1.17–5.53
Early sexual debut (before age 15)						
No	103	75.2	246	94.3	1	
Yes	34	24.8	15	5.7	5.39	2.84–10.57

[a] Totals for some variables may differ due to missing values.
[b] OR = odds ratio.
[c] CI = confidence interval.

their families. For example, parental absence—a main indicator for early pregnancy—may be the result of unavoidable circumstances (e.g., migration due to economic hardship or lack of social services, or nontraditional work hours that require leaving adolescent girls in others' care). In addition, according to the current study, pregnancy risk increased only for adolescents who experienced absence of both parents (not for adolescents experiencing absence of just one parent). The protective factor for adolescent pregnancy might therefore depend more on maintaining some type of parental watch over adolescent girls at all times than on adhering to the traditional family model (mother, father, and children).

Several other studies also state that poverty increases girls' risk of experiencing pregnancy during adolescence (1, 5–7, 35, 37, 38). In Ecuador, 28.0% of the poorest adolescent women experience pregnancy, versus only 11% of those in the wealthiest group (1). Significant socioeconomic gaps and the resulting inequities exist even in an impoverished area like Orellana. Pathways between poverty and early pregnancy might stem from lack of access to reproductive health services as well as fewer educational opportunities. Poverty is obviously another risk factor far beyond the control of the adolescent girl. It is also a reflection of how social, political, and economic factors influence issues as intimate as the sexuality and reproductive life of young women.

The characteristics of first sexual intercourse also influenced the risk of getting pregnant during adolescence. Having sexual intercourse before age 15 and not using contraception during first sexual encounter increased the risk of experiencing pregnancy during adolescence. Effective contraception at first intercourse requires access to acceptable, high-quality reproductive health services for adolescents. It is also essential that adolescent girls have access to accurate information about various forms of contraception, and the freedom and power to not only choose a preferred method but also successfully negotiate its use with their partners. This prerequisite—and its significant effect on adolescent pregnancy—underscores the positive consequences of using a reproductive and sexual rights–based approach in public health interventions targeting young girls (39).

TABLE 4. Multivariate conditional logistic regression analysis of selected adverse events during childhood-adolescence, socio-demographic indicators, and sexual and reproductive health variables as risk factors for pregnancy among adolescent women, Orellana, Ecuador, 2006

Risk factor	aOR[a]	95% CI[b] (range)
Sexual abuse		
No	1	
Yes	3.06	1.08–8.68
Parents' absence		
Both parents present	1	
Only one parent present	0.69	0.16–3.00
Both parents absent	10.67	2.67–42.63
Socioeconomic status		
Highest tertile	1	
Middle tertile	4.30	0.57–32.39
Lowest tertile	15.23	1.43–162.45
Early sexual debut (before age 15)		
No	1	
Yes	8.51	1.12–64.90
Sex education at secondary school		
Yes	1	
No	2.05	0.40–10.65
Family member experiencing adolescent pregnancy		
No	1	
Yes	2.43	0.82–7.26

[a] aOR = odds ratio adjusted for all variables in the table.
[b] CI = confidence interval.

Although it might seem obvious that adolescent pregnancy is associated with being in a formal union, this finding highlights some new issues that are recommended for further research. For example, in the case of unions initiated before pregnancy, the real question is not "Why do adolescent girls get pregnant so early?" but rather "Why do they engage in formal unions so early and why do they get pregnant so quickly after that?" The issue of early marriages is currently under analysis by various United Nations agencies (e.g., WHO and the United Nations Population Fund (UNFPA)) who are challenging the traditional perception of marriage as a shelter from the risks of adolescence (7, 37). In the case of unions occurring after adolescent pregnancy, the issue of single-mother stigma arises. Data from earlier qualitative research in the Amazon basin indicate that for many adolescents this stigma is associated with being pregnant and without a partner (and not due to the adolescent pregnancy itself) (40). This evidence suggests interventions targeting adolescent pregnancy should, as a starting point, examine how gender constructions interact with sexual behavior and norms.

The current study found that a significantly higher percentage of cases (pregnant girls) versus controls had dropped out of school at the time of the survey; 41.3% of them stated that leaving school was due to pregnancy and 36.3% attributed their dropout status to marriage. The nexus between adolescent pregnancy and school dropout has also been observed elsewhere, along with evidence that schools should develop and target interventions to diminish dropout rates among pregnant girls (41–43). In school and other environments, the low status and stigma associated with adolescent pregnancy stem from taboos against not only sexual intercourse but any type of sexual activity among young girls. The fact that 36.3% of pregnant girls reported leaving school because of marriage highlights the issue of gender discrimination and inequity within relationships, and underscores the need to determine whether the problem begins with premature pregnancies or premature formal unions.

Programs and policies for the prevention of adolescent pregnancies in Orellana should address not only the individual adolescent girl and her behavior but also the political, social, and cultural factors that influence how young girls and adolescent women are perceived and treated. The need for contraception during first sexual intercourse as a protective factor requires improvement in local educational and health services for adolescents. Strengthening the accessibility, availability, acceptability, and quality of family-planning services for adolescents would increase girls' capacity to use contraception and prevent unwanted pregnancies.

Programs and policies targeting adolescent pregnancy should have a rights-based approach. Increasing girls' freedom and power to exercise their reproductive rights is necessary to enable them to take action in cases of sexual abuse and to help them maintain resilient attitudes when experiencing adverse events.

Limitations

The number of adolescents who had an abortion, according to the current study, may be underestimated due to lack of disclosure caused by stigma surrounding the procedure, which is illegal in Ecuador. Since the current study selected cases and controls based on pregnancy status (vs. "ever experiencing motherhood"), some girls selected as controls may have, in fact, been cases (i.e., they could have had an abortion but chosen not to disclose the information to the interviewer). Selection may also have been skewed by the fact that girls who lived with their parents could not provide any data without the authorization of their parents, since the interview teams requested permission to conduct the interview from any parents who lived with their adolescent daughters. This aspect of the study design may have indirectly excluded the most vulnerable girls (e.g., those suffering from sexual abuse by family members) by inadvertently providing a means for families to prevent disclosure of sensitive information.

The fact that the study included both sexually active and sexually inactive girls among the controls is another limitation, as the girls who were not sexually active obviously did not have the same risk of getting pregnant as sexually active girls. However, excluding girls who were not sexually active would have eliminated the ability to study various protective factors for first sexual intercourse.

An additional limitation of the study stems from the criteria used to match cases and controls (age, and place of residence), which were ultimately found to be associated with a wide range of sexual experience and union status. This disparity could simultaneously confound predictors of sexual experience, union formation, and pregnancy status. Although this report points out those

risk factors, more research focusing on sexually active adolescent girls is recommended to disentangle the associations between pregnancy and sexual debut, early union formation, and sexual abuse.

In addition, because no relevant information was available from the Orellana area, this study calculated the sample size based on estimates from other settings, which might have resulted in a smaller sample size than required (and could explain some of the large confidence intervals).

The use of the ACE questionnaire in this study's setting might also be seen as a limitation, since the survey questions were developed for a U.S. population. It should be noted, however, that this instrument was selected because no alternative for measuring adverse childhood-adolescent experiences in a Latin American setting could be identified, and pilot research in the current study's setting (the Amazon basin) indicated the ACE questions were appropriate.

Conclusions

To the authors' knowledge, this is the first case-control study in Latin America examining risk factors for pregnancy among adolescent girls at the community level in a rural setting. The study considered a broad array of risk factors that enabled the discovery of associated variables at both the behavioral and structural level. Behavioral factors increasing the risk for getting pregnant during adolescence in Orellana included early sexual debut and non-use of contraception during first sexual intercourse. Structural factors associated with the same outcome included living in a very poor household, having suffered from sexual abuse during childhood-adolescence, and family disruption (living extended periods of life without both parents).

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Factores de riesgo de embarazo en adolescentes de la cuenca amazónica de Ecuador: estudio de casos y controles

RESUMEN

Objetivo. Analizar los factores de riesgo de embarazo en adolescentes de la cuenca amazónica de Ecuador.

Métodos. Estudio de casos y controles pareados, identificados mediante una encuesta demográfica y de salud realizada en Orellana, Ecuador, entre mayo y noviembre de 2006. Se aplicó un cuestionario dirigido a recabar información sobre: condiciones socioeconómicas, estructura familiar, nivel educacional, salud reproductiva y traumas durante la niñez y la adolescencia. Se empleó la regresión logística condicional para ajustar por posibles factores de confusión.

Resultados. Entre las que respondieron la encuesta se encontraron 140 casos y se seleccionaron 262 controles. Los factores asociados mediante el análisis multifactorial con un mayor riesgo de embarazo adolescente fueron: abuso sexual durante la infancia o la adolescencia (razón de posibilidades (*odds ratio*, OR) = 3,06; intervalo de confianza de 95% [IC95%]: 1,08 a 8,68); inicio temprano de la vida sexual (OR = 8,51; IC95%: 1,12 a 64,90); haber vivido largos períodos sin sus padres (OR = 10,67; IC95%: 2,67 a 42,63); y vivir en un hogar muy pobre (OR = 15,23; IC95%: 1,43 a 162,45). Otros dos factores se asociaron estadísticamente en el análisis bifactorial: estar casada o vivir en unión consensual (OR = 44,34; IC95%: 17,85 a 142,16) y no estar matriculada en la escuela al momento de la entrevista (OR = 6,31; IC95%: 3,70 a 11,27). En una submuestra de adolescentes que habían iniciado su vida sexual, no haber utilizado un método anticonceptivo durante su primera relación sexual resultó también un factor de riesgo (OR = 4,30; IC95%: 1,33 a 13,90).

Conclusiones. El inicio temprano de las relaciones sexuales, la no utilización de un método anticonceptivo durante la primera relación sexual, vivir en un hogar muy pobre, haber sufrido abuso sexual durante la niñez o la adolescencia, y la separación familiar (haber vivido largos períodos sin sus padres) se asociaron con los embarazos en adolescentes en Orellana.

Palabras clave Embarazo en adolescencia; violencia sexual; anticoncepción; familia; factores de riesgo; Ecuador.