ADVERSE CHILDHOOD EXPERIENCES AND REPEAT INDUCED ABORTION

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Abstract

Objective—To characterize the backgrounds of women who have repeat abortions.

Study Design—In a cross-sectional study of 259 women (M=35.2±5.6 years), the relation between adverse experiences in childhood and risk of having 2+ abortions versus 0 or 1 abortion was examined. Self-reported adverse events occurring between ages 0-12 were summed.

Results—Independent of confounding factors, women who experienced more abuse, personal safety, and total adverse events in childhood were more likely to have 2+ versus 0 abortions (OR=2.56, 95% CI=1.15-5.71; OR=2.74, 95% CI=1.29-5.82; OR=1.59, 95% CI=1.21-2.09) and versus 1 abortion (OR=5.83, 95% CI=1.71-19.89; OR=2.23, 95% CI=1.03-4.81; OR=1.37, 95% CI=1.04-1.81). Women who experienced more family disruption events in childhood were more likely to have 2+ versus 0 abortions (OR=1.75, 95% CI=1.14-2.69) but not versus 1 abortion (OR=1.16, 95% CI=0.79-1.70).

Conclusions—Women who have repeat abortions are more likely to have experienced childhood adversity than those having 0 or 1 abortion.

Keywords

contraception; early adversity; life events; repeat abortions

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More abortions are performed in the United States than in any other Western nation.[1] Among American women, unintended pregnancies represent almost 50% of all pregnancies and approximately 40% of all unintended pregnancies end in abortion.[2] Repeat abortions are also common in the United States; 47% of women who have an abortion have had one or more previous abortions.[2] In comparison, in Canada and the United Kingdom, rates of repeat abortions are 35.5% and 32%, respectively.[3-4]

The experience of having an initial abortion provides a powerful opportunity to intervene in preventing subsequent unintended pregnancies. Intervention efforts in this population, however, have met with limited success. For example, in one study of 613 women presenting for an induced abortion, an intervention using specialized contraceptive counseling and provision compared to usual care showed no long-term impact on reducing the occurrence of having a subsequent abortion over the next two years.[5] Additionally, although the overall number of abortions in the United States has declined,[2] rates of repeat abortions remain steady,[6] suggesting that women who are susceptible to recurrent unintended pregnancies require new intervention approaches.

Interventions to reduce repeat abortions will need to target risk factors for subsequent unintended pregnancies with particular emphasis on those factors that are linked to repeat abortions. Previous research shows that, in addition to the identification of several socio-demographic characteristics of women who have repeat abortions (e.g., increased age, non-White ethnicity)[3] [6-7], experiences of abuse, including intimate partner violence and history of sexual abuse, distinguish women undergoing a repeat versus first abortion.[3] Abuse history has also been linked to other deleterious reproductive health outcomes, including unplanned pregnancy, sexual risk taking behaviors, poor adherence to contraception, and having a sexually transmitted infection.[8-10]

The present study builds on the existing literature by evaluating whether abuse *in childhood* relates to the probability of having repeat abortions in adolescence and adulthood. Previously reported associations between abuse and repeat abortions examined *lifetime* history of abuse only,[3] allowing for possible confounding by experiences of current abuse. Additionally, given the increased prevalence of non-abuse compared to abuse events, the present study also evaluated whether non-abuse adverse events, such as family difficulties (e.g., death of a parent) and issues of personal safety (e.g., home robbery) may increase the likelihood of having repeat abortions or whether any associations are limited to abuse-related exposures.

The current sample included 259 reproductive-age women who provided by interview and questionnaire-based methods, information regarding their exposures to adverse events in childhood as well as their lifetime reproductive medical history. We hypothesized that increased exposures to abuse as well as non-abuse adverse events in childhood would increase the likelihood of a woman having repeat abortions (i.e., 2+) in adolescence and adulthood compared to never having had an abortion or having only one abortion.

METHODS

Participants

The current sample was derived from an on-going population-based study of ovarian aging (the "OVA Study") which includes women belonging to a large integrated health care delivery system serving a wide and generally representative population in Northern California.[11] Selection criteria for the OVA Study require that participants be between ages 25-45, have regular menses, and have their uterus and both ovaries intact. All participants self-identify as one of five different ethnicities: Caucasian, African-American, Latino, Chinese, or Filipino and speak/read English, Spanish, or Cantonese. Participants are excluded if they report a major medical illness, are on medications affecting the menstrual cycle within the 3 months prior to study participation or are pregnant or breastfeeding. As a part of the OVA Study protocol, women participate in an in-person interview, undergo a transvaginal ultrasound, and have their blood drawn. Additionally, beginning 4 months after the initiation of the OVA Study, participants began to also complete a questionnaire packet of self-report measures, including the measure of stressful life events used in the present

analysis. The participants considered for inclusion in the current sample were those women who enrolled in the study at the time the questionnaire packet was added to the study protocol. Over a one-year period (June 2007 to May 2008), 295 women enrolled in the OVA Study. Of these, 259 (88%) completed the questionnaire packet and are included in the present analysis. The study protocol was approved by the University of California San Francisco Committee on Human Research as well as the Kaiser Permanente of Northern California Institutional Review Board. Informed, written consent was obtained from all study participants.

Measures

Abortion History—Information regarding abortion history was obtained from an in-person medical history interview. Participants underwent a structured interview administered by trained research associates in which a detailed medical history was obtained. As a part of this interview, women were asked to identify each pregnancy they experienced and the outcome of the pregnancy. In cases in which a pregnancy was terminated by abortion, other relevant details, including the age of the participant at the time of the abortion and whether the abortion was medically indicated, were ascertained. Women were classified as having no abortion, 1 abortion, or 2+ abortions.

Stressful Life Events—The original Life Events Checklist[12] was adapted to include 26 items pertaining both to conventional life events (e.g., parental divorce) as well as traumatic life events (e.g., sexual abuse). For each of 14 items relevant to childhood, participants were asked to indicate whether they experienced the event and their age(s) at the time the event occurred. Participants were assigned one point for each event they endorsed having experienced in childhood defined as occurring between ages 0-12. Items were summed to create a total score (score range=0-14). In addition, 3 subscale scores were calculated reflecting abuse history, family disruption, and threats to personal safety. Abuse history (score range=0-2) consisted of 2 items pertaining to (1) physical abuse and (2) sexual abuse. Family disruption (score range=0-6) consisted of 6 items pertaining to (1) death of a parent, (2) separation or divorce of parents, (3) witnessing physical fights between parents, (4) witnessing frequent arguments between parents, (5) living with a relative who has a serious drinking or drug problem, and (6) living with a relative who has a psychiatric illness. Threats to personal safety (score range=0-6) consisted of 6 items pertaining to (1) being in a life-threatening accident, (2) suffering a serious illness or injury, (3) witnessing violence to another person, (4) experiencing a home robbery, (5) being in a natural disaster, and (6) being physically assaulted.

Statistical Analysis

All participants had complete data on the variables of primary interest, including abortion history and stressful life events in childhood. Regarding covariates (age, race, childhood socioeconomic status, and number of pregnancies), 8 participants (3.1%) had missing data on mother education; a multiple linear regression procedure was used to estimate these 8 missing values from 3 predictor variables, including participant's age (in years), race (1=White, 2=non-White), and education (in years).[13] Comparison of women with and without missing values on mother education showed missingness was unrelated to abortion history or stressful life events in childhood (p's >.05). Seven participants (2.7%) had missing data on father education and 12 participants (4.6%) indicated that they did not have a father or father-figure present in their lives. Values for missing data on father education were not imputed. Mother and father education were then standardized and summed to create an index of childhood socioeconomic status; in cases in which father education was missing, mother education only was used in the index of childhood socioeconomic status.

Among the remaining covariates (age, race, and number of pregnancies), all participants had complete data.

To compare women who had 0 (n=170), 1 (n=46), and 2+ (n=43) abortions on socio-demographic factors, reproductive history, and exposures to stressful life events, analysis of variance (ANOVA) was used to examine continuous variables and chi-square to examine dichotomous variables. For ANOVAs in which group differences reached statistical significance, post hoc multiple comparisons were computed.

Stepwise logistic multiple regression analyses were used to determine whether exposures to stressful life events in childhood relate to the probability of having repeat abortions in later life. In separate regression equations, the total number of stressful life events, the stressful life events composites (abuse history, family disruption, and threats to personal safety), and the individual physical and sexual abuse items were entered as independent variables in relation to 3 dichotomized abortion outcomes: having 1 abortion (n=46) vs. 0 abortions (n=170), having 2+ abortions (n=43) vs. 0 abortions (n=170), and having 2+ abortions (n=43) vs. 1 abortion (n=46). The following covariates were entered simultaneously on the first step of each regression equation: age (in years), race (1=White, 2=non-White), childhood socioeconomic status (indexed by summing the standardized values of mother and father education), and number of pregnancies. The regression coefficient (B), significance value (p), odds ratio (OR), and 95% confidence interval (CI) were derived for each regression equation; statistical significance was set at $p<.05$. Statistical analyses were performed using Version 17.0 of SPSS.

RESULTS

Sample Characteristics

The sample consisted of 259 women between the ages of 25-45 (M=35.2 ± 5.6 years). The sample was multi-ethnic, including 101 (39%) participants who self-identified as non-White: African-American (n=67, 26%), Latino (n=13, 5%), Chinese (n=12, 5%), and Filipino (n=9, 3%). All participants chose to complete the study protocol in English. The majority (70%) of the participants held a college or graduate-level degree while 39% of the participants' mothers were college educated or greater. Almost half of the sample had never been married, 42% were currently married, and the remaining 11% were widowed, separated, or divorced. Consistent with previous research[2], among the 89 women reporting having had an abortion, 48.3% of them had had two or more abortions.

Group Comparisons by Abortion History

For descriptive purposes, women who had 0 (n=170), 1 (n=46), and 2+ (n=43) abortions were compared on socio-demographic factors, reproductive history, and exposures to adverse events (Table 1). Regarding women with 2+ abortions compared to women with 0 or 1 abortion, post hoc multiple comparisons of significant differences by ANOVA showed that women with 2+ abortions were older than women with 0 abortions and were less educated than women with 0 or 1 abortion. With respect to reproductive history, women with 2+ abortions experienced more pregnancies than women with 0 or 1 abortion and had more live births and were younger at their first pregnancy than women with 0 abortions. Results of chi-square analyses also showed significant differences between White and non-White women with a greater number of non-White women belonging to the 2+ abortion group. Lastly, in descriptive analyses, a greater percentage of women with 2+ abortions compared to women with 0 or 1 abortion were shown to have experienced adverse events in childhood, including 35.7% who experienced physical or sexual abuse, 50% who

experienced 2 or more events related to family disruption, and 16.7% who experienced 2 or more events related to issues of personal safety.

Logistic Multiple Regression

Results of logistic multiple regression analyses are reported in Table 2. Following adjustment for covariates (age, race, childhood socioeconomic status, and number of pregnancies), women reporting a greater overall number of stressful life events were more likely to have 2+ abortions in adolescence/adulthood versus 0 (OR=1.59, 95% CI=1.21-2.09) or 1 abortion (OR=1.37, 95% CI=1.04-1.81). Similarly, women reporting a greater number of abuse and personal safety-related stressful life events were more likely to have 2+ abortions in adolescence/adulthood versus 0 (OR=2.56, 95% CI=1.15-5.71 and OR=2.74, 95% CI=1.29-5.82, respectively) or 1 abortion (OR=5.83, 95% CI=1.71-19.89 and OR=2.23, 95% CI=1.03-4.81, respectively). With respect to family disruption-related stressful life events, women reporting a greater number of events were more likely to have 2+ abortions in adolescence/adulthood compared to 0 (OR=1.75, 95% CI=1.14-2.69) but not compared to 1 abortion (OR=1.16, 95% CI=0.79-1.70). In contrast, women reporting more stressful life events were no more likely to have 1 versus 0 abortions in adolescence/ adulthood for the overall number of stressful life events (OR=1.17, 95% CI=0.96-1.44) as well as abuse, personal safety, and family disruption-related stressful life events (OR=0.79, 95% CI=0.35-1.79; OR=1.30, 95% CI=0.69-2.42; and OR=1.34, 95% CI=1.00-1.79, respectively).

As described above, with each 1-unit increase in abuse-related stressful life events (that is, having never experienced abuse [coded 0]; versus having experienced either physical abuse *or* sexual abuse [coded 1]; versus having experienced both physical *and* sexual abuse [coded 2]), women were 2.6 times more likely to have 2+ abortions compared to having 0 abortions (OR=2.56, 95% CI=1.15-5.71) and almost 6 times more likely to have 2+ abortions compared to having 1 abortion (OR=5.83, 95% CI=1.71-19.89). In follow-up analyses, the individual physical and sexual abuse items were examined to determine their respective associations with abortion number. Results showed that while women reporting sexual abuse-related stressful life events were more likely to have 2+ abortions compared to 0 (OR=3.41, 95% CI=1.05-11.09) and 1 abortion (OR=9.12, 95% CI=1.70-48.97), women reporting physical abuse-related stressful life event were no more likely to have 2+ compared to 0 (OR=3.23, 95% CI=0.80-13.12), 2+ compared to 1 (OR=6.45, 95% CI=0.87-47.98), or 1 compared to 0 (OR=0.66, 95% CI=0.13-3.24) abortions.

COMMENT

Unintended pregnancies represent almost 50% of all pregnancies with approximately 40% ending in abortion.[2] The remaining proportion of unintended pregnancies that are carried to term are associated with deleterious maternal and infant/child health outcomes.[14-18] That nearly 50% of women who have an abortion report having had a previous abortion[2] underscores how commonly unintended pregnancies recur. Elucidating the risk factors for repeated unintended pregnancies, leading either to abortion or delivery, is an important objective in advancing women's health and in providing novel opportunities for intervention at the time of the first unintended pregnancy. In the current investigation, adverse circumstances in childhood were examined in relation to a woman's probability of having repeat abortions during adolescence and adulthood. Results showed that women who had 2+ abortions were more likely to have been exposed to adverse events in childhood compared to women who had 0 or 1 abortion. These associations were independent of correlates of repeat abortion, including increased age, non-White ethnicity, lower childhood socioeconomic status, and a greater number of pregnancies. Additionally, the study hypotheses regarding the salience of abuse as well as non-abuse events were confirmed.

That is, in addition to experiences of abuse, non-abuse adverse events were also shown to confer risk for repeat abortions, re-defining by broadening the group of women considered to be at risk.

Consistent with previous research linking abuse to deleterious reproductive outcomes,[3 8-10] results highlight the role of abuse histories in relation to risk for repeat abortions. For every 1-unit increase in reported abuse history (i.e., having no abuse history vs. reporting physical *or* sexual abuse vs. reporting *both* physical and sexual abuse) the likelihood of having 2+ abortions was 2.6 times greater than for never having had an abortion and almost 6 times greater than for having 1 abortion. Additionally, non-abuse adverse events were also found to relate to risk for repeat abortion with adverse events pertaining to personal safety appearing to be especially problematic. For every 1-unit increase in personal safety-related events, the likelihood of having 2+ abortions versus no abortion and 1 abortion was 2.7 times and 2.2 times greater, respectively. This is the first study to demonstrate that abuse events as well as experiences that are stressful but not abusive play a role in predisposing some women to have repeat abortions.

Understanding *why* difficult life circumstances in childhood relate to a woman's risk of having repeat abortions in adolescence and adulthood is an important area for future investigation. Women who are exposed to significant levels of stress in childhood may experience a variety of barriers to the prevention of repeated unintended pregnancies. For example, childhood adversity, including abuse history, has been linked to risky sexual practices,[19-21] poorer mental health outcomes,[22-24] and problems forming successful intimate relationships,[21 25-27], all experiences that have potential implications for effective contraceptive use. Previous research suggests that aspects of a woman's self-concept, such as perceiving oneself as incompetent or ineffective –correlates of low self-esteem and/or low self-efficacy– may underlie adulthood outcomes of childhood adversity.[28-31] Because women with such self-attributes lack confidence in their ability to exert control over their environments, problems related to feelings of being out of control or misguided attempts to take control (e.g., sexual risk-taking behaviors) can arise. Future studies should consider how the negative influences of childhood adversity on a woman's self-concept in adulthood, may mediate effects of adverse events on risk for repeat abortion by impeding a woman's ability to negotiate appropriate contraceptive use following an initial abortion.

A strength of the current study was that the reliability of abortion history information was enhanced by collecting these data through an extensive in-person interview in the context of a comprehensive medical history interview. Weaknesses were that the study was cross-sectional and relied upon women's self-reports of their experiences in childhood and their reproductive medical history over periods of adolescence and adulthood. Underreporting in particular has been shown to be a problem when conducting research on sensitive topics such as abortion.[32-33] In the current study, although we cannot specifically quantify effects of potential underreporting, there did not appear to be differential underreporting among the women who reported no abuse/event histories which could have artificially inflated observed associations between adversity experiences in childhood and abortion history. That is, approximately one-third of women who reported not having experienced abuse or any stressful life events reported having 1+ abortion, a figure that is consistent with national estimates.[34] Additionally, the sample size was relatively small and the confidence intervals for some of the effect sizes were wide. The current sample was similar, however, to other larger samples in terms of the proportion of women reporting repeat abortions and the socio-demographic correlates of repeat abortions.[2-3 6-7] The limited sample size also precluded secondary analyses stratified by race to determine whether relations between childhood adversity and abortion history may vary by cultural factors.

Because the sample was relatively small in size, well-educated with 70% of women having a college or graduate degree, and were participating in a study of reproductive aging, the generalizability of the current findings may also be limited. In addition, the selection requirement that the women not be currently pregnant or breastfeeding may not only have further enhanced the non-representativeness of the sample but also precluded opportunities to assess alternative pregnancy outcomes. In fact, the current study was limited to the examination of self-reported abortion history and did not collect information pertaining to pregnancy intention or desire. Therefore, the examination of early life adversity in relation to repeat unintended pregnancies that were carried to term rather than terminated could not be examined. This alternative outcome remains an important area for future investigation as almost half of all unintended pregnancies are carried to term with approximately one-third specifically classified as being unwanted.[34] The consequences of unintended pregnancies carried to term are significant, including delayed use of prenatal care, continued maternal smoking and alcohol use, pre-term and low birthweight births, developmental delays in infancy, and increased risk for abuse in childhood.[14-18]

In conclusion, increased exposures to adverse events in childhood distinguish women with repeat abortions from women with 0 or 1 abortion. Correlates of repeat abortion, including increased age, non-White ethnicity, lower childhood socioeconomic status, and greater number of pregnancies do not account for this difference. Findings are consistent with previous research linking adverse childhood experiences, and in particular childhood abuse, to a variety of negative outcomes (e.g., sexual risk-taking behaviors), impeding effective contraceptive use. Clinical implications are that women who have initial abortions should be screened for abuse history as well as exposures to adverse events more generally to determine who may benefit from specialized interventions. Such interventions should target the specific barriers that make it difficult for women with adverse childhood backgrounds to prevent subsequent unintended pregnancies; current standard of care practices limited to providing counseling on contraceptive use may be inadequate in this population.

Acknowledgments

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Table 1

Descriptive statistics examining sociodemographics, reproductive history, and stressful life events across groups of women having 0, 1, and 2+ abortions.

	0 Abortion (n=170)	1 Abortion (n=46)	2+ Abortion (n=43)	Test Statistic	Sig	η^2
Sociodemographics:						
Age (in years)*	34.6 (5.5)	35.6 (5.9)	37.0 (4.8)	F=3.38	.036	.026
Race (% non-White)	29.3%	53.1%	59.5%	χ^2=18.1	.000	-
Education (in years)*	16.7 (2.6)	16.2 (2.0)	14.8 (2.6)	F=9.71	.000	.071
Marital status (% married)	43.4%	42.9%	38.1%	χ^2=0.4	.824	-
Father education (in years)*	15.1 (4.1)	15.3 (3.4)	13.1 (3.3)	F=4.08	.018	.034
Mother education (in years)	14.5 (3.2)	14.2 (3.1)	13.2 (2.6)	F=2.87	.058	.022
Reproductive History:						
Ever pregnant (%)	19.3%	-	-	-	-	-
Had live birth (%)	17.1%	50.0%	50.0%	χ^2=26.3	.000	-
No. of pregnancies*	0.40 (1.0)	2.2 (2.0)	4.3 (2.5)	F=96.74	.000	.474
No. of live births*	0.32 (0.9)	0.93 (1.2)	1.2 (1.5)	F=12.38	.000	.103
Age at first pregnancy*	26.6 (6.8)	21.2 (4.9)	19.2 (3.2)	F=18.29	.000	.266
Age at first live birth	26.4 (5.8)	26.6 (7.6)	23.2 (4.3)	F=1.95	.151	.061
Age at first abortion	-	22.6 (5.3)	20.3 (4.4)	F=4.10	.046	.053
Age at second abortion	-	-	25.5 (5.4)	-	-	-
Stressful Life Events:						
Any abuse history (%)	19.2%	12.2%	35.7%	χ^2=8.2	.017	-
Physical abuse (%)	8.4%	4.1%	16.7%	χ^2=4.5	.103	-
Sexual abuse (%)	15.1%	10.4%	26.8%	χ^2=4.8	.092	-
Family Disruption (% 2+ events)	29.3%	38.8%	50.0%	χ^2=6.8	.033	-
Personal Safety (% 2+ events)	4.2%	8.2%	16.7%	χ^2=8.1	.017	-

*
Age: sig. differences between 2 vs. 0 (p<.05); Education: sig. differences between 1 vs. 0 (p<.001) and 2 vs. 1 (p<.05); Father education: sig. differences between 2 vs. 0 (p<.05) and 2 vs. 1 (p<.05); Number of pregnancies: sig. differences between 1 vs. 0 (p<.001), 2 vs. 0 (p<.001), and 2 vs. 1 (p<.001); Number of live births: sig. differences between 1 vs. 0 (p<.01) and 2 vs. 0 (p<.001); Age at first pregnancy: sig. differences between 1 vs. 0 (p<.001) and 2 vs. 0 (p<.001).

Table 2

Logistic regression analyses examining the probability of having 1 vs. 0 abortion, 2+ vs. 0 abortion, and 2+ vs. 1 abortion based on exposures to stressful life events in childhood.[*]

Life Events :	1 abortion (n=46) vs. 0 (n=170)			2+ abortions (n=43) vs. 0 (n=170)			2+ abortion (n=43) vs. 1 abortion (n=46)		
	B	p	OR (95% CI)	B	p	OR (95% CI)	B	p	OR (95% CI)
Total	.16	.127	1.17 (0.96-1.44)	.46	.001	1.59 (1.21-2.09)	.32	.025	1.37 (1.04-1.81)
Abuse History	-.24	.573	.79 (0.35-1.79)	.94	.022	2.56 (1.15-5.71)	1.76	.005	5.83 (1.71-19.89)
Physical Abuse	-.42	.608	.66 (0.13-3.24)	1.17	.101	3.23 (0.80-13.12)	1.87	.069	6.45 (0.87-47.98)
Sexual Abuse	-.22	.708	.81 (0.26-2.50)	1.23	.042	3.41 (1.05-11.09)	2.21	.010	9.12 (1.70-48.97)
Family Disruption	.29	.050	1.34 (1.00-1.79)	.56	.010	1.75 (1.14-2.69)	.15	.454	1.16 (0.79-1.70)
Personal Safety	.26	.419	1.30 (0.69-2.42)	1.01	.009	2.74 (1.29-5.82)	.80	.042	2.23 (1.03-4.81)

[*] Analyses were adjusted for covariates: age (in years), race (0=White, 1=non-White), childhood SES (indexed by the sum of standardized mother and father education [in years]), and number of pregnancies.