

Adverse childhood experiences and repeated induced abortion in Aquitaine region, France: a cross-sectional survey

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Abstract

Objective: The aim of this study was to analyse the relation between adverse childhood experiences exposure and repeated induced abortion considering the potential effect of social deprivation and intimate partner violence. **Design:** An observational cross-sectional survey. **Setting:** This survey was conducted within the framework of the regional health agency of the Aquitaine area in each of the 25 induced abortion centres from June 15 to September 15, 2009, as well as to all women over 18 having an induced abortion with a liberal doctor under convention with of the centres previously referred to. **Sample:** 806 women asking for an induced abortion who responded to questions regarding adverse childhood experiences and previous abortion. **Methods:** Collecting data was achieved by a self-conducted anonymous questionnaire. **Main outcome measure:** The percentage of repeated induced abortion. **Results:** The percentage of patients with no exposure to adverse childhood experiences decreases (28%; 20%; 9%) when induced abortion are repeated according to the abortion rank (first, 2nd, 3rd or +), whereas the percentage of women with high exposure increases (17%; 27%; 32%). The adjusted odds ratio of a third request or more for abortion is 7.73 (3.56-16.77) for patients with high exposure to adverse childhood experiences when compared to women with no exposure who had a first induced abortion. **Conclusion:** There is a strong graded link between the magnitude of exposure to adverse childhood experiences and repeated induced abortion.

Introduction

The number of induced abortions (IA) performed in has been relatively stable since 1990 [1]. However, this stability does not reflect the evolutions among the population confronted with this event. Multiple trajectories can be noticed concerning the resort age, including a decrease before 20 years old and a clear increase between age 20 and 29, but between age 30 and 39 as well [1]. In addition, an increase in level 2 and higher abortions have been noticed, this increase being compensated by the decrease of level 1 abortion [2]. This decrease in first demands of abortions can be seen as a consequence of the increase of birth control efficiency that was encouraged in the early 2000's by taking patients' choices into account, and promoted by counselling as well as the developing use of long-acting reversible contraception [3].

The increase of repeated induced abortions (RIA) reveals a different problematic. When birth control is generally considered as the main tool of unwanted pregnancies prevention, this solution alone seems to be inefficient for women or couples that keep repeating it [4].

During our study on the healthcare itinerary of women undergoing an abortion according to a vulnerability score, we have shown the existence of a strong connection between psycho-social precariousness, and RIA on one hand and on the other hand intimate partner violence (IPV) [4]. Indeed, vulnerable patients resort more frequently to an IA (39% versus 29%, $p < 0.001$). They are more often victims of violence, more often

put their health at risk, and are in discord with their partner. In our sample of women declaring one or several risky behaviour or situation (45%), 60% were vulnerable, especially concerning domestic violence.

Many studies show otherwise that being or having been the victim of violence, particularly sexual violence, has implications in the sexual behaviour and the handling of contraception, which increases the risk of an unwanted pregnancy [5, 6].

In the late 90s, a French team showed that women that had more than one IA were more often in an unstable relational situation associated to financial difficulties, in a context of poor family relations during childhood [7]. Works provided by Felitti and Anda have shown us that being exposed to adverse childhood experiences (ACE) had consequences in terms of cardiovascular, bronchopulmonary, hepatic, psychiatric or auto-immune illnesses, but also in terms of drug addiction, or sexual behaviour. Indeed, using intercourse by age 15, teen pregnancy, teen paternity and having multi sexual partners (more than 50) with the associated pregnancy risk, as measures of sexual behaviour, they found that ACE Score has a proportionate relation to these outcomes, indicating the complexity of the relationship of early life psychosocial experience to what are usually considered purely biomedical outcomes [8].

The aim of this study was to analyse the link between ACE exposure and RIA taking into account the potential effect of social deprivation (SD) and IPV.

Methods

Design of the study

An observational cross-sectional survey was suggested to all women asking for an IA in each of the 25 IA centres in from June 15 to September 15, 2009, as well as to all women over 18 having an IA with a liberal doctor under convention with one of the centres previously referred to. We prompted women who did not master the French language to ask for help if they felt the need to.

Collecting data was achieved by a self-conducted anonymous questionnaire.

The questionnaire was handed out by the first health professional in touch with the patients, who pointed out its confidential nature. It was filled by the women willing to participate to the study and slipped in an envelope. The sealed envelope was then transferred to the survey sponsor-investigator. This survey has been carried out within the framework of the regional health agency of the area.

We have inspired ourselves from COCON national inquiry's questionnaire [9], and from a Canadian study's questionnaire comparing women requesting their first IA to the ones coming for a second one or more [10]. The questionnaire form was structured in three parts:

- Let's talk about you today: Age, not living with partner, having had children (0, 1, 2, 3 or more), SD (unemployment, housing problem, and month's end with money hardship), evidence of IPV (psychological, insults, physical, sexual).
- Let's talk about your previous IA: number.
- Let's talk about you yesterday: Having experienced household or family dysfunction as a child, having suffered from psychological, physical or sexual abuse in childhood or adolescence, having the traumatic memory of a loved one's death, have had a self-dangerous behaviour during adolescence.

Sample

The survey did not include women under 18 years old because the questions were intrusive and required parental agreement. Moreover, a specific survey for these young women had been planned some weeks later. All medical termination of pregnancy were excluded too because not relevant to this subject.

Indicators

We have studied the rank of the IA as outcome variable, mainly in two classes: 1st IA vs 2nd IA or further.

The adverse childhood experiences have been considered as the exposure factor. From the part of questionnaire concerning “Let’s talk about you yesterday”, 9 items of adverse childhood experiences could be answered by respondents, as following:

- Abuse (3 items)
- Emotional: preference of another sibling, unwanted child (accident), a child of which the gender was not wished for, excessive severity, denigration, humiliation, scapegoat, overprotecting, other.
- Physical: physical hits, bodily abuse, neglect, stripping of liberties, isolation, other.
- Sexual: touching, exhibitionism, sexual assault, rape, incest, other.
- Household or family dysfunction (4 items)
- Witnessed domestic violence between parents
- Household member was alcoholic or drug user
- Household member was chronically depressed
- Separated parents
- Having the traumatic memory of a loved one’s death (1 item)
- Have had a self-dangerous behaviour during adolescence (1 item)
- Suicide attempt or eating troubles or self-harm or hazardous behaviour (such as addiction, scarification, drunkenness).

We have computed an ACE score by the simple add of adverse experiences, this score varied from 0 for women answering ‘no’ to each of the nine items to 9 for women having checked the all 9 items. We have classified the sample in 3 groups: women without adverse experience, women reporting from 1 to 3 ACE and women reporting more than 3 ACE.

The following characteristics have been considered: women’ age, number of children (0, 1, 2, 3 or more), social deprivation due to unemployment or housing problems, and the occurrence of IPV.

Statistical analysis strategy

Firstly we have described the demographic parameters of the sample and compared them according to the rank of the IA. Secondly the percentages of each ACE as the distribution of the ACE score in 3 classes have been compared depending on the rank of IA (1st vs 2nd or further) like the percentages of IPV and of SD. Using logistic regression models, the crude odds ratios (OR) of RIA (to be in the group of 2nd IA or further) have been calculated by each ACE, the ACE score, and by IPV and SD. Then, these same OR have been estimated after adjustment for demographic parameters (age and having had children-yes/no). In order to be more informative, we describe also our main result, about the ACE score, according to the rank of IA in 3 classes: 1st, 2nd and 3rd or further, at the end of the “Results”.

We also have explored the possible role of IPV and of SD, in the relation between ACE and RIA. For that we used mediation models (the R package med flex) to estimate the mediating effect of SD and IPV on the relation between ACE and RIA [11]. For this mediation analysis ACE has been used as a two- class factor (women with more than 3 ACE vs other women). Models were adjusted for age and having children. Results are expressed as OR (95% CI).

All tests were 2-sided and P values less than .05 were considered significant. Analyses were performed using SAS software (version 9.4) or R software (version 3.6.1).

Results

A total of 875 women completed the questionnaire. We excluded 25 records from women less than 18 years old, 26 from women with unfulfilled self-questionnaire and 18 from women with missing number of previous IA. The results are therefore issued from a sample of 806 women. Among these women, 473 (58.7%) had their first IA and 333 women (41.3%) had a second or further IA.

Rank of IA by women characteristics

As expected, women who had at least one previous IA were older than those who had their first IA (**table 1**). The percentage of single women (those living without a partner) was not significantly different between the two groups whereas the proportion of women who had children was significantly higher among women with previous IA. Nevertheless, among women who were mothers, the number of children was very similar in both groups.

Concerning the different items of ACE (**table 2**), 8 ACE out of 9 are significantly associated to the risk of RIA. Thus, having suffered from psychological or physical abuse during childhood, have had an auto-aggressive behaviour during adolescence are associated with RIA with adjusted OR superior or equal to 1.8 and significant. Equally, with OR slightly inferior but significant and superior to 1 : having witnessed domestic violence between parents, household member was alcoholic or drug user, having separated parents, having suffered from sexual abuse, having the traumatic memory of a loved one's death. The only item of ACE not being significantly associated with the risk of RIA is when a household member was chronically depressed (p value: 0,11).

Concerning the score of ACE, having an intermediate exposition to ACE is associated to an increased risk of RIA with an adjusted OR of 1.88 (1.25-2.81) considering the absence of exposition, the adjusted OR associated with a strong exposition being of 3,50 (2.17-5.64) considering the absence of exposition to ACE.

In addition, having already been confronted to IPV is strongly associated to the risk of repeated IA with an adjusted OR of 2.32 (1.34-4.03).

Lastly women who were in situation of social deprivation had more frequently a RIA with an adjusted OR of 2.01 (1.43-2.81).

Relation between ACE and IPV (data not shown in table)

About 8% of respondents reported being exposed to IPV. Among the 9 ACE that we investigated, 3 were strongly related to IPV. Thus, women who reported IPV answered more frequently having witnessed domestic violence between parents (32% vs. 20% among women not victims of IPV, $p=0.03$), having suffered from physical abuse in childhood (22% vs. 11%, $p<0.01$) and having a traumatic memory of a loved one's death (59% vs. 41%, $p<0.01$). The other 6 ACE were not significantly related to the occurrence of IPV in adulthood. Concerning the score cumulating the 9 ACE it can be noticed a trend of a higher index in the group of women reporting IPV (limit of statistical significance) whereas the percentage of women having reported none ACE is higher in the group of women who are not exposed to IPV: 24% vs. 11%.

Mediation analysis (figure 1)

The existence of IPV does not significantly intervene in the connection between ACE (more than 3 items) and RIA (OR =1.01, $p=0.61$), whereas part of this connection comes through SD (OR=1.09, $p=0.02$). This breakdown leads to the conclusion that there is an indirect effect on both significant tested mediators (OR=1.09, $p=0.03$). However, the -direct effect of ACE on RIA is strong and significant even after the account of the two mediators simultaneously (2.06 (1.43; 2.99) $p<0.001$). As an informative side note, the total effect (meaning if we do not consider the effect of both of these mediators) is measured the following way: OR=2.24 [1.55-3.24], $p<0.001$.

Link between ACE and more specified rank of the induced abortion (table 3)

We tried to evaluate the impact of the intensity of ACE exposure (absent, intermediate or strong) according to the rank of the abortion (1st, 2nd and 3rd or higher).

The percentage of patients with no exposure to ACE decreases (28%; 20%; 9%) when IA are repeated according to the abortion rank (1st, 2nd, 3rd or +), whereas the percentage of women with high exposure increases (17%; 27%; 32%). These results clearly show the existence of a dose-response association between the intensity of exposure to ACE and RIA. The adjusted OR of a third request or more for abortion is 7.73 (3.56-16.77) for patients with high exposure to ACE when compared to women who have a first IA. This

OR is also significantly higher than 1 when compared to women having a second IA. These adjusted OR are lower but also significant for patients with intermediate level of exposure to ACE.

Discussion

Main findings

Unreported ACE is associated to a less important repetition of IA whereas a strong exposition is a favouring factor. IPV is more present in the event of RIA but is not a mediating factor of the relation between ACE and RIA. In addition, the situations of SD are more frequent in the event of RIA and demonstrate a minor part of it. There is a strong graded relation between the extent of exposure to adverse childhood experiences and repeated induced abortion.

Strengths and limitations

The data was collected in 2009 but there weren't major changes to it ever since. The number of IA in women being over 18 that the Regional Health Agency of Aquitaine drew a list of from 06/22/2009 to 09/22/2009 is 2109 which corresponds to a response rate of 38% (Regional Health Agency data). Moreover, all population-types are represented (urban, peri-urban, semi-rural and rural) which gives a population-based status to this data base. The liability of the inquiry's results is reinforced by those of a 2014 survey with different women on the same population area regarding the same theme, with consistent results, especially regarding precariousness and IPV. However, the childhood data was not available in the 2014 survey [3]. On another point of view, it is about a big region with superimposed data to national data. Limitations to our study include reliance on self-reports of sensitive issues (e.g., history of abuse or household dysfunction) which could result in social desirability response bias. Although considerable valid research attests the accuracy of self-reports in the area of sexual and reproductive health behaviour [12].

Interpretation of the results

The RIA rate in France, 2008 was 35.4% [2]. Concerning Aquitaine, the repetition rate was 37.21% in 2009 (Regional Health agency data) which is coherent with our data. This percentage was 37% in Norway between 2007 and 2011 [13], 36% In the Netherlands in 2010 [14], 42% in Sweden in 2011 [15], 37% in Canada in 2014 [16], 38% in England and Wales in 2015 [17], and 38% in Finland in 2018 [18]. However, in the United-States, this percentage is higher at 48% in 2014 [19].

Concerning the social deprivation, our results show that women that had a previous IA found themselves in a more difficult and precarious social situation. A French study finds consistent results in 2014 [20]. The same data was found in the United Kingdom [21], in Scotland [22] and in the USA [23].

The occurrence of IPV is found in 8% of patients that answered the survey, and they are more frequent in the case of a previous IA. Domestic violence can be seen especially in the management of procreation (birth control and IA). This association is found in the USA [24], in the United-Kingdom [25, 26], in Sweden [27], in Pakistan [28] in Uganda [29], as well as in a meta-analysis done in 2014 [30]. It is particularly strong in the occurrence of RIA and found in France [4, 31], in Canada [10], in the UK [22, 25] and in Sweden [27].

We are noticing a strong link between ACE exposures, especially concerning having witnessed domestic violence between parents, having suffered from physical abuse in childhood and having a traumatic memory of a loved one's death, and the occurrence of IPV. These results are also found by other studies in France [31] or in Uganda [29] for the two first items mentioned above. There is no investigation about having a traumatic memory of a loved one's death available in the literature at our knowledge.

Our results show a strong graded connection between the magnitude of exposure to adverse childhood experiences and repeated induced abortion. This dose-effect association is found in an American study about the association of exposure to ACE and unintended [32] or adolescent pregnancy [33]. It is also found in Canada [10]. To conclude, our results confirm and enrich the data of a 2011 preliminary study in the USA [34].

Conclusion

Repeated induced abortion can be interpreted as a form of lifting childhood violence denial that leads to a predisposition to a social precariousness and exposition to domestic violence. Repeated induced abortion should be an alert sign to recognise women or couples exposed to adverse childhood experiences known to increase the risks of drug addiction, cardio-vascular, bronchopulmonary, hepatic, psychiatric or auto-immune illnesses [35].

All women requesting an IA, particularly the young and those who ask for another IA, should benefit from benevolent, empathetic and guilt-free care during the visits for IA (before, at the moment of, and after with the prevention visit 3 weeks later).

The confirmation of a link between repeated IA and IPV must allow health professionals to point out violence experienced by women, in order to be in a more global approach. Indeed, more than just taking care of the problems related to violence, it will allow the patients to appropriate a more efficient contraception method [36]. Therefore, the choice of a long-term birth control method could be promoted because its restraints compliance issues, bad use, or difficulties to renew a prescription, this allowing the prevention of RIA [37]. However, all birth control alternatives must be exposed, especially the possibility of choosing a definitive birth control method, possible in France if the patient is at least 18 years of age and had respected a 4-month reflection time period.

The post-IA interview is a crucial moment to approach, in a retrospective way, the intimate experience that was lived. It has to be anticipated at the end of a pre-IA interview by specifying that the type of feeling expected after an IA is relief: relief to not having to force herself on a lifetime care that she is incapable of providing. Indeed, the IA must be understood as an act of parental responsibility, which is to protect one's children. This paradox, in fact, has to be apprehended: the protection in this case is to not bring the child to life if the parental entity, represented by the female most of the time, does not see herself as capable of assuming this lifetime engagement.

It is also the moment, if there is no evidence of domestic violence, to explicitly invite the companions in, by reminding their systematic co-responsibility of the lived event, but also to offer the same type of care and by suggesting to participate in the birth control consultations as well, since they are just as concerned. Their presence is also necessary during the consultation of the possible following pregnancy.

This support allows the caregiver to become the enlightened witness, described by the author Alice Miller known for her essays about consequences of childhood violence on adulthood [38], again mentioned in Felitti and Anda's conclusions [6]. It is an opportunity offered to this woman, this couple, to restore this negatively affected self-esteem (during the first years of life) - with the time needed to learn again.

The primary prevention of an IA could come from the parental education in middle and high school, a subject that could be easier to face rather than sexual education because it goes from the well-known consequence that a pregnancy could occur, and thus the associated parental function. A specific enlightenment should be brought on protective effects of family strengths: family closeness, support, loyalty, protection, love, importance, and responsiveness to health needs [39].

Finally, it could be interesting to better study and understand the connection between ACE and first IA by comparing women in different situations, those requesting an IA, and others wishing to pursue the pregnancy, according to previous IA, ACE exposure and by considering their socio-economic situation and the quality of their intimate life.

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Disclosure of interests

None

Contribution to authorship

SH was involved in the conception and planning of the study, in acquisition and analysis of the data, and drafted the paper.

ML was involved in the conception and design of the study, in the acquisition of data, and gave final approval for the article.

LMM conducted quantitative and qualitative analysis in consultation with MJS.

MJS was involved in revising the article critically for important intellectual content.

SH, MJS and LMM contributed to interpretation of the data by commenting on successive drafts, and approved the final version

Details of ethics approval

A simplified declaration was made to the CNIL (Commission Nationale Informatique et Libertés) on 04/29/2009 (n° 1361350).

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Supporting information:

Appendix S1: Questionnaire

Appendix S2: Centres list

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