Provision of long-acting reversible contraception at surgical abortion—A cross-sectional nationwide register study

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Abstract
Introduction: Provision of long-acting reversible contraception (LARC) at surgical abortion is safe, practical, and leads to higher user rates than does delayed provision. The aim of this study was to explore whether provision of LARC at surgical abortion is associated with known risk factors for subsequent abortions and inconsistent use of contraception, including sociodemographic factors and psychiatric disorders.

Material and Methods: This was a register-based cross-sectional study of 6251 women having a surgical abortion in Sweden. Data were collected from National health and population registers. Women with procedure codes for surgical abortion were identified in the National Patient Register from October 2016 to December 2018. Information from Statistics Sweden, the National Patient Register, and the Swedish prescribed drug register on sociodemographic factors, psychiatric disorders, and dispensed LARC was added and linked on an individual level. Associations of sociodemographic factors and psychiatric disorders with LARC provision were explored with generalized logit mixed models and presented as crude and adjusted odds ratios with 95% confidence intervals (CIs).

Results: The overall rate of LARC provision at the time of the abortion was 2515/6251 (40.2%). Younger age and lower level of education were associated with an increased likelihood of LARC provision. In the study population, 2624/6251 (42.0%) patients had a pre- or post-abortion psychiatric disorder, a factor associated with an increased likelihood of LARC provision compared with women with no such disorders (adjusted odds ratio 1.21; 95% CI 1.08–1.34). The highest rates and odds were seen among women with personality, substance use, and/or neurodevelopmental disorders and among women with multiple psychiatric disorders.

Conclusions: Sociodemographic risk factors and psychiatric disorders were associated with increased LARC provision at surgical abortion, indicating that women at high risk of unwanted pregnancies are provided with effective contraception. Still,
1 | INTRODUCTION

In Sweden, approximately half of the 37,000 yearly cases of induced abortion are performed in women who have had at least one previous abortion.\(^1\) When counselling patients on post-abortion contraception, risk factors for subsequent abortions and inconsistent contraceptive use should be considered. Women with low socioeconomic resources, including low level of education, unemployment, and immigrant status, are more likely to encounter unwanted pregnancies and recurrent abortions.\(^2\)–\(^5\) Moreover, psychiatric disorders, such as depressive, anxiety, personality, eating, substance use, and/or bipolar disorders, have been associated with lower levels of hormonal contraceptive use or with inconsistent contraceptive use.\(^3\)–\(^6\)\(^,\)\(^7\) Also, women with neurodevelopmental disorders more often engage in risky sexual behavior and are at higher risk of unplanned pregnancy than are women in general.\(^8\)–\(^9\)

Long-acting reversible contraception (LARC, i.e., intrauterine devices and contraceptive implants) is more effective in preventing subsequent unwanted pregnancies and abortions than short-acting reversible contraception and is associated with high user satisfaction and continuation rates.\(^10\)–\(^12\) Still, misconceptions and structural and economical barriers from healthcare providers and women limit their use.\(^13\)

As in many other countries, medical abortion has become the dominant abortion method in Sweden, with less than 10% of today's abortions being surgical.\(^1\) LARC insertion could be a reason for choosing a surgical abortion as immediate placement is safe and effective\(^14\) compared with medical abortion where the woman has to return for insertion. However, how common this practice is, and what characterizes women who are provided with LARC at the time of surgical abortion, has not previously been studied in a Swedish population-based setting.

The aim of this study was to explore whether provision of LARC at surgical abortion is associated with known risk factors for unwanted pregnancy and inconsistent contraceptive use, including sociodemographic factors, psychiatric disorders, and neurodevelopmental disorders.

2 | MATERIAL AND METHODS

This was a register-based cross-sectional study of women having surgical abortion in Sweden between October 2016 and December 2018. Information was collected from health and population registers held by the National Board of Health and Welfare and Statistics Sweden.\(^15\)–\(^16\) The National Patient Register (NPR) and the Swedish Prescribed Drug Register were linked to the Longitudinal integrated database for health insurance and labor market studies (LISA) of Statistics Sweden through each woman's unique personal identity number. Standardized codes for medical and psychiatric diagnoses and surgical procedures, based on the International Classification of Diseases, 10th Revision (ICD-10)\(^17\) were retrieved from the NPR, including inpatient and specialized outpatient visits. The Prescribed Drug Register provided information on dispensed prescribed medical therapeutics between 2015 and 2018, using the World Health Organization's anatomical therapeutic chemical classification (ATC) codes.\(^18\)

2.1 | Study population and outcome

The study population consisted of 6251 women aged 15–49 years who had a surgical abortion identified in the NPR through procedure codes for surgical abortion (ICD-10 LCH00 or LCH03). This information was, after legal changes, made available in the NPR from October 2016, which defined the start of data collection. Of 6262 cases originally identified, 11 were excluded from the analyses: Nine women aged >49 years (n = 9) were excluded as surgical abortion was considered unlikely and the diagnostic procedure code was regarded as unreliable and a potential misclassification; two women had no information in the LISA register (n = 2). Women <15 years of age were not included as the LISA register only covers the population aged ≥15 years. For women with multiple abortions during the time period (n = 173), information was restricted to the first abortion registered to ensure nondependency in statistical analysis.
The outcome was provision of LARC at the time of surgical abortion. LARC provision was defined either through an ICD-10 procedure code in the NPR indicating insertion of an intrauterine device (ICD-10 TLC00) or of a contraceptive implant (ICD-10 TQX20) on the day of the abortion or through a dispensed prescription of LARC from 4 weeks prior to the abortion and up to 4 weeks afterwards. Information on dispensed prescriptions was derived from the Prescribed Drug Register through ATC classification codes for hormonal intrauterine devices and contraceptive implants (Table S1). Cases without these codes were categorized as "No LARC."

2.2 | Exposures

The following sociodemographic factors were obtained from the LISA database to describe the economic and social situations of the women: age (categorized into the subgroups 15–19, 20–24, 25–29, 30–34, 35–39, and 40–49 years), migrant status (nonmigrant and migrant [i.e., ever migrated to Sweden]), country of birth (Nordic countries, Africa, Asia, and other [i.e., North America, South America, Russia, and Europe except the Nordic countries]), family situation (married/cohabiting versus single/not cohabiting with a partner), number of minor children in the household (no and yes), level of education (<9, 9–12, and >12 years), and employment (employed and not employed [including students with governmental financial aid and women on maternal leave with parental financial benefits]).

Information on the following psychiatric disorders was retrieved using ICD-10 codes in the NPR of specialized inpatient and outpatient care, registered before or after the abortion between 2015 and 2018: depressive and anxiety disorders, bipolar disorder, psychotic disorders, personality disorders, substance use disorders, neurodevelopmental disorders, sleep disorders, and eating disorders. Women with multiple diagnoses and disorders were analyzed in each psychiatric disorder category. As numbers of participants with sleep and eating disorders were low, these conditions were excluded from further separate analyses. As mild to moderate psychiatric disorders are primarily diagnosed and treated in primary care, and diagnoses from nonspecialized clinics are not included in the NPR, prescription of psychotropic drugs (i.e., antidepressants, psychostimulants, antipsychotics, and drugs used in addictive disorders) dispensed pre- or post-abortion during the time period 2015–2018 according to the Prescribed Drug Register further defined the selected psychiatric disorders (Table S2).

2.3 | Statistical analyses

Descriptive statistics for sociodemographic factors registered during the year of the abortion and for psychiatric disorders registered pre- or post-abortion, including means with standard deviations and absolute and relative frequencies (%), were calculated according to whether or not LARC was provided at abortion. Associations between sociodemographic factors or psychiatric disorders and LARC were explored with generalized logit mixed models using explanatory factors as fixed factors and hospital (site of abortion) as a random effect to account for clustering between gynecological units and local practices. Estimates are presented as crude and adjusted odds ratio (OR and aOR, respectively) with 95% confidence interval (CI). In the adjusted model of sociodemographic factors and LARC, age was included as a continuous variable. In the analyses of psychiatric disorders and LARC, adjustments were made for age, family situation, and level of education. All analyses were performed with SPSS® statistical software version 26 (IBM Corp®).

2.4 | Ethical approval

Ethical approval was obtained from the Swedish Ethical Review Authority on 5 August 2019 (permit no: 2019-03742) with amendments on 5 November 2019 (permit no: 2019-03742).

3 | RESULTS

Among all women having surgical abortion, the mean age was 30.1 years and a majority were born in the Nordic countries. More than half of the women were single or not cohabiting with a partner (58.3%) and had minor children in the household (67.7%). In total, 22% had ≤9 years of education, and 26.9% were not employed (Table 1).

In total, 40% of women were provided with LARC at surgical abortion. In adjusted analyses, LARC provision decreased with higher age (aOR 0.97; 95% CI 0.96–0.97) and increased with lower educational status (aOR 1.64; 95% CI 1.40–1.92) and unemployment (aOR 1.22; 95% CI 1.08–1.37), whereas the associations with migrant status and country of birth were rendered nonsignificant after adjustment for age (Table 1).

Psychiatric disorders, before or after the surgical abortion, were reported among 2624/6251 (42.0%) women. Depressive and anxiety disorders were most reported (37.5%), followed by neurodevelopmental disorders (10.3%). More than one psychiatric disorder was reported among 1063/6251 (17.0%) women. Women with psychiatric disorders had a higher chance of LARC provision at abortion (aOR 1.21; 95% CI 1.08–1.35), and the highest odds were observed among women with personality, substance use, and neurodevelopmental disorders when compared with women without psychiatric disorders (Table 2). Compared with women without psychiatric disorders, women with multiple psychiatric disorders, but not women with only one psychiatric disorder, had a higher likelihood of LARC provision (aOR 1.58; 95% CI 1.36–1.83; aOR 1.02; 95% CI 0.90–1.16, respectively). The number and frequency of psychiatric disorders based on ICD-10 diagnoses and/or dispensed prescribed psychotropic drugs is presented in Table S3.
In this population-based register study, social vulnerability and factors such as younger age, lower educational status, and not being in employment were associated with higher rates and likelihood of LARC provision at surgical abortion. In addition, women with psychiatric disorders, particularly personality, substance use, and neurodevelopmental disorders, were more likely to be provided with LARC at the time of the abortion than were women without psychiatric disorders.

Strengths of the study include the population-based setting, with coverage of aggregated data from several national health registers covering the total population. Inclusion of data in Swedish government-administered registers is mandatory, which minimizes selection bias. Studies of population-based registers are therefore well-suited to investigate treatments in typical use conditions.
TABLE 2 Psychiatric disorders and provision of long-acting reversible contraceptives at surgical abortion (N = 6251)

| Psychiatric disorder               | No LARC n = 3736 | %     | LARC n = 2515 | %     | OR    | 95% CI  | aOR   | 95% CI |
|-----------------------------------|------------------|-------|---------------|-------|-------|---------|-------|-------|
| Any psychiatric disorder          | No               | 2268  | 60.7          | 1359  | 54.0  | 1.0     | 1.0   |       |
|                                   | Yes              | 1468  | 39.3          | 1156  | 46.0  | 1.31    | 1.19–1.46 | 1.21 | 1.08–1.35 |
| Depressive and anxiety disorders  | No               | 2413  | 64.6          | 1497  | 59.5  | 1.0     | 1.0   |       |
|                                   | Yes              | 1323  | 35.4          | 1018  | 40.5  | 1.24    | 1.12–1.38 | 1.20 | 1.07–1.34 |
| Bipolar disorders                 | No               | 3660  | 98.0          | 2444  | 97.2  | 1.0     | 1.0   |       |
|                                   | Yes              | 76    | 2.0           | 71    | 2.8   | 1.40    | 1.01–1.94 | 1.27 | 0.90–1.79 |
| Psychotic disorders               | No               | 3536  | 94.6          | 2301  | 91.5  | 1.0     | 1.0   |       |
|                                   | Yes              | 200   | 5.5           | 214   | 8.5   | 1.64    | 1.35–2.01 | 1.44 | 1.17–1.78 |
| Personality disorders             | No               | 3634  | 97.3          | 2403  | 95.5  | 1.0     | 1.0   |       |
|                                   | Yes              | 102   | 2.7           | 112   | 4.5   | 1.66    | 1.26–2.18 | 1.69 | 1.40–2.04 |
| Substance use disorders           | No               | 3511  | 94.0          | 2245  | 89.3  | 1.0     | 1.0   |       |
|                                   | Yes              | 225   | 6.0           | 270   | 10.7  | 1.88    | 1.56–2.26 | 1.62 | 1.33–1.96 |
| Neurodevelopmental disorders      | No               | 3446  | 92.2          | 2163  | 86.0  | 1.0     | 1.0   |       |
|                                   | Yes              | 290   | 7.8           | 352   | 14.0  | 1.93    | 1.64–2.28 | 1.56 | 1.31–1.86 |

Abbreviations: aOR, adjusted OR; CI, confidence interval; LARC, long-acting reversible contraception; OR, odds ratio.
ORs with 95% CI were retrieved by logistic regression.
Adjusted analysis (aOR with 95% CI) were conducted with explanatory factors in the table and with age, family situation, and level of education as fixed factors under the random effect of hospital. Included in analysis: n = 6139.
Women with more than one psychiatric disorder (n = 1063) were analyzed in each psychiatric disorder category, so individuals may be included in several categories.

In contrast to trial conditions. Any factor known to limit adherence, such as psychiatric disorders and migrant status, are frequent reasons for exclusion from clinical trials and surveys, so our study results have higher generalizability among women having a surgical abortion. However, the results are not generalizable to women undergoing medical abortion. In the analysis, clustering of individuals and local practices within hospital units was taken in consideration with multilevel logistic regression.

One limitation of the cross-sectional register design is that, although associations can be described, it does not enable conclusions about causation. Information from registers has low granulation, and it is not possible to draw conclusions on aspects such as women’s contraceptive choice (LARC or no LARC), reasons for providers recommending or women choosing surgical abortion, or continuation rates of contraceptive use. Further, we did not distinguish between psychiatric disorders being diagnosed pre- or post-abortion, which limits the interpretation of our results. However, neuropsychiatric disorders usually have their onset during childhood, and many psychiatric disorders have a lifelong course. Psychiatric disorders such as substance use disorders, depression, and neurodevelopmental disorders often coexist.20 In our material, women with more than one psychiatric disorder were analyzed in each psychiatric disorder category, so individuals may have been included in several categories.

Depression and/or anxiety could follow an unwanted pregnancy and abortion.21 In addition, LARC has been associated with mood disorders in retrospective and epidemiological studies, but causation has not been shown in prospective studies, and provision of hormonal contraception is considered safe among women with psychiatric diagnoses.22,23 By including diagnoses from 2015, we aimed to capture women with recent health care visits and/or prescriptions. Still, misclassifications and underreporting of psychiatric disorders and contraceptive use cannot be excluded.

Women with low socioeconomic status have been reported to experience recurrent unwanted pregnancies and abortions.2,4 Initiation of LARC at the time of an abortion is an important means to prevent subsequent abortions, especially among young women and other vulnerable groups.11,12 Besides young age, other risk factors for contraceptive failure and unplanned pregnancies are low educational status and unemployment.2,4,24 In our material, there was a relatively high proportion of women not in current employment (26.9%). However, this category also included students and women on maternal leave with associated governmental financial support and low income. We found that young age, low educational level, and being without employment were associated with provision of LARC at surgical abortion, indicating that these women are either identified by health care providers or actively choose to initiate LARC use.

A possible explanation for the higher odds of LARC provision among younger women could be that women aged <21 years in Sweden are entitled to receive their preferred contraceptive method free of charge. This includes all available LARC methods. Women aged up to 26 years pay only approximately €10 per LARC device or a maximum of €10 per year for any other method. Older women have to cover the actual cost of any chosen method.

Immigrant women have been described as having a higher risk for adverse reproductive health outcomes, including unwanted
pregnancy and abortion, than nonmigrant women, which may be connected to immigrants’ socioeconomic situation. In our study, migrant status was not a determinant of LARC provision at the abortion, after accounting for age. Parity, prior pregnancies, and previous induced abortions could potentially increase the use of LARC. In our study, we had no information on parity but found that women with minor children in the household had an increased likelihood of LARC provision compared with women without children in the household. Further, we found that women who were not cohabiting with a partner were less likely to be provided with LARC than were married or cohabiting women. Women who are not cohabiting with a partner may therefore have a higher risk of a subsequent unwanted pregnancy. Lack of emotional support from a partner has also been associated with a higher risk of recurrent abortion.

Women with different kinds of psychiatric disorders have been described as being at risk of unplanned pregnancies and less frequent or inconsistent contraceptive use than women in the general population. Teenage pregnancy and birth have been shown to be more common in women with neurodevelopmental disorders, and women with attention deficit/hyperactivity disorder (ADHD) have a 9- to 11-fold increased risk of giving birth as teenagers than do women without ADHD, despite the widespread availability of contraception in Sweden. It is known that adolescents with ADHD more often engage in risky sexual behavior and are at higher risk for unplanned pregnancies than adolescents without neuropsychiatric disorders. Provision of LARC may mitigate these risks. The proportion of women with any type of psychiatric disorder in our material was 42%, which is likely to be higher than the prevalence of psychiatric disorders in the general population. This could suggest that women with a history of psychiatric disorders more often experience unwanted pregnancy and choose or are advised to have a surgical abortion rather than a medical abortion. We found that women with neurodevelopmental and/or substance use disorders had an increased likelihood of LARC provision at surgical abortion than their unaffected peers. In an observational US study, women with opioid use disorder with easy access to post-abortion LARC and public insurance had a higher likelihood of LARC provision at surgical abortion than women without this disorder. Moreover, we noticed that women with more than one reported psychiatric disorder were provided more often with LARC than were women with one or without any psychiatric disorder. Although we did not further analyze aspects such as type of reported concurrent disorders and whether the disorders were reported before or after the abortion, this may indicate that women with more severe psychiatric conditions were recognized as a group with a particular need for effective contraception.

LARC insertion at surgical abortion is safe and practical and leads to higher user rates than does delayed provision. It has been described that uptake of LARC after surgical abortion is higher and that women more often choose LARC in connection with surgical abortion than after medical abortion. The overall use of LARC among women of fertile age in Sweden has been estimated at approximately 30%. Therefore, we anticipated that the overall rate of LARC provision at the time of a surgical abortion would be well above this and found it to be 40% in this study. Provision of contraception at abortion must be the result of informed choice and consent. However, we believe that the provision rate in our study suggests that the opportunity for LARC insertion at the time of surgical abortion is not fully taken advantage of. The subsidization of LARC for younger women may favor provision in this group, whereas cost could be a barrier for initiating LARC for women aged >25 years. Structured contraceptive counseling increases LARC provision rates after abortion and thereby effectively prevents subsequent abortions. In our study, we found a high proportion of women with psychiatric disorders and women who were not employed. This suggests that our study population may represent a vulnerable group of women with a high risk of unwanted pregnancy. Although we found that women with risk factors for recurrent unwanted pregnancy were provided with LARC to a higher extent, future efforts should focus on tailoring contraceptive counselling for high-risk groups. How subgroups of women with low socioeconomic status or psychiatric disorders respond to structured contraceptive counseling is unknown. More research is needed to investigate contraceptive continuation rates and to address the specific needs of these women.

5 | CONCLUSION

We found that women with a high risk of a new unwanted pregnancy and subsequent abortion are, to some extent, identified and provided with LARC at the time of a surgical abortion in Sweden. However, the overall provision rate in our study suggests that improved access to LARC and tailored counselling could lead to an even higher proportion of women taking the opportunity to have LARC inserted at surgical abortion.

CONFLICTS OF INTEREST

S Hogmark reports personal fees from Gedeon Richter and Bayer outside the submitted work. NE reports personal fees from Bayer outside the submitted work. AW declares no conflict of interest. CS Hogmark reports personal fees from Gedeon Richter and Bayer for serving on an advisory board outside the submitted work.

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REFERENCES

1. The National Board of Health and Welfare, Socialstyrelsens statistik om aborter. Accessed July 29, 2021. https://www.socialstyrelsen.se/statistik och-data/statistik/statistikamen/aborter/

2. Makenzious M, Tydén T, Darj E, Larsson M. Repeat induced abortion—a matter of individual behaviour or societal factors? A cross-sectional study among Swedish women. Eur J Contracept Reprod Health Care. 2011;16:369-377.

3. Leeners B, Bieli S, Huang D, Tschudin S. Why prevention of repeat abortion is so challenging: psychosocial characteristics of women at risk. Eur J Contracept Reprod Health Care. 2017;22:38-44.

4. Stone N, Ingham R. Who presents more than once? Repeat abortion among women in Britain. J Fam Plan Reprod Health Care. 2011;37:209-215.

5. Rasch V, Gammeltoft T, Knudsen LB, Tobiassen C, Ginzel A, Kempf L. Induced abortion in Denmark: effect of socio-economic situation and country of birth. Eur J Public Health. 2008;18:144-149.

6. Stidham Hall K, Moreau C, Trussell J, Barber J. Young women’s consistency of contraceptive use—does depression or stress matter? Contraception. 2013;88:641-649.

7. Toffol E, But A, Heikinheimo O, Latvala A, Partonen T, Haukka J. Associations between hormonal contraception use, sociodemographic factors and mental health: a nationwide, register-based, matched case-control study. BMJ Open. 2020;10:e040072.

8. Pollak Y, Dekkers TJ, Shoham R, Huizenga HM. Risk-taking behavior in attention deficit/hyperactivity disorder (ADHD): a review of potential underlying mechanisms and of interventions. Curr Psychiatry Rep. 2019;21:33.

9. Owens EB, Hinshaw SP. Adolescent mediators of unplanned pregnancy among women with and without childhood ADHD. J Clin Child Adolesc Psychol. 2020;49:229-238.

10. Winner B, Peipert JF, Zhao Q, et al. Effectiveness of long-acting reversible contraception. N Engl J Med. 2012;366:1998-2007.

11. Kilander H, Alehagen S, Svedlund L, Westlund K, Thor J, Brynhildsen R. Current barriers and potential strategies to increase the use of long-acting reversible contraception at surgical abortion—A cross-sectional nationwide register study. Acta Obstet Gynecol Scand. 2016;95:565-571.

12. Kuroki LM, Allsworth JE, Redding CA, Blume JD, Peipert JF. Is a previous unplanned pregnancy a risk factor for a subsequent unplanned pregnancy? Am J Obstet Gynecol. 2008;199(517):e1-7.

13. Skoglund C, Kopp Kallner H, Skalkidou A, et al. Association of attention-deficit/hyperactivity disorder with teenage birth among women and girls in Sweden. JAMA Network Open. 2019;2:e1912463.

14. Aiken A, Lohr PA, Aiken CE, Forsyth T, Trussell J. Contraception and mental health: a commentary on the evidence and principles for practice. Contraception. 2013;88:641-649.

15. Steel Z, Marnane C, Iranpour C, et al. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980–2013. Int J Epidemiol. 2014;43:476-493.

16. WHO Collaborating Centre for Drug Statistics Methodology. ATC/ADD Index. Accessed July 29, 2021. https://www.whocc.no/atc_ddd_index/

SUPPORTING INFORMATION

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