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## CLINICAL ARTICLE Regret following female sterilization in Slovenia

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#### ABSTRACT

*Objective:* To estimate the regret rate and risk factors for regret among women who have undergone sterilization. *Methods:* A retrospective study was conducted among all women who underwent a sterilization procedure at the University Medical Center Maribor, Maribor, Slovenia, in 2008–2012. Identified women were contacted and asked to complete an online questionnaire assessing regret and symptoms associated with depression. *Results:* Among 714 identified women, 308 (43.1%) completed the questionnaire. Four (1.3%) participants reported regret, and 9 (2.9%) reported that they would not opt for sterilization again, all of whom had post-sterilization problems. Such problems were significantly associated with participants reporting that they would not opt for sterilization again (P = 0.003). Additionally, women who would not choose sterilization again had significantly higher scores on the depressive scale used than did those who would undergo sterilization again (P = 0.028). *Conclusion:* Few women report regret after tubal sterilization in Slovenia. However, an additional consultation on post-sterilization problems and depressive disorder before sterilization might minimize the risk of regret.

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#### 1. Introduction

Female sterilization is a permanent method of birth control accomplished by occlusion of the fallopian tubes. The most common method is laparoscopic sterilization, by which the fallopian tubes are occluded using loops, clips, or electrocoagulation [1]. Sterilization can also be performed by hysteroscopy (Essure procedure), in which spring-like implants are placed into the fallopian tubes, where they elicit benign tissue growth, leading to permanent occlusion after 3 months [2]. The third main method is postpartum sterilization, which is performed at the end of a cesarean.

Sterilization is the most common contraceptive method among married couples in the USA and is associated with high effectiveness and relatively mild adverse effects [3–5]. However, studies have shown that at least some women experience regret following sterilization. The proportion of women experiencing regret varies among countries and populations: generally, the prevalence of regret is higher in low-income countries, such as Brazil (10%–20% [6]) and India (5%–8% [7]), than in high-income countries, such as the USA (4% [8]) and France (5.5% [9]). Specific risk factors for regret have been previously described and include young age, making the decision to undergo sterilization alone, insufficient information provided about the consequences of sterilization by health professionals, changes in family structure, and depression [4,7,10–15]. Several studies have examined the connection between depression and

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sterilization [16–19]. Because depression is twice as common in women as in men [20], it would be interesting to investigate how it affects the perception of sterilization further.

In Slovenia, sterilization is regulated by the Health Measures in Exercising Freedom of Choice in Childbearing Act, which states that sterilization can be performed only when requested by a certifiably sane woman or man who is older than 35 years. Additionally, each procedure must be legally approved by the Hospital Commission on Sterilization and Abortion and must be performed earlier than 6 months after approval is granted. If a patient is not certifiably sane but has medical indications for sterilization, the procedure can be performed as long as permission is obtained from the patient's parents or caretakers. The sterilization procedure is performed exclusively in hospitals that are under the auspices of the Ministry of Health.

The aim of the present study was to examine the regret rate and risk factors for regret in patients who underwent sterilization at a hospital department in Slovenia. Additionally, correlations between regret and risk of depressive disorder were assessed.

#### 2. Materials and methods

A retrospective, questionnaire-based study was conducted among all women who underwent a sterilization procedure at the University Medical Center Maribor, Maribor, Slovenia, between January 1, 2008, and December 31, 2012. The study protocol was approved by the Ethics Committee and Institutional Review Board of the University Medical Center Maribor (No. 109/13). Patients were identified through the online medical system and invited to participate by post in March 2013. Their anonymity was guaranteed.

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The initial invitation contained an individual password that would allow participants to complete an online questionnaire. The questionnaire included 20 closed-ended multiple choice questions, such as "Do you regret that you had sterilization?" and "Would you undergo sterilization again?" (response categories were "yes," "no," and "don't know"). Additionally, four open-ended questions assessed when the regret first occurred and the reason for regret. Finally, the Zung Self-Rating Depression Scale-a short self-administered survey consisting of 20 items that measure the affective, somatic, and psychological symptoms associated with depression [21]-was also included. Each item included in this survey is scored on a Likert scale ranging from 1 to 4, where 1 means "a little of the time" and 4 means "most of the time." An overall score, ranging from 20 to 80, is obtained by adding the individual item scores. A score above 50 suggests a high probability of depression. A second invitation letter with a new password was posted to patients who had not yet answered the questionnaire 3 months after the first invitation letter.

SPSS 17.0 (SPSS Inc, Chicago, IL, USA) was used for statistical analysis, with sterilization regret as the dependent variable. The Pearson  $\chi^2$  test was used for analysis. P < 0.05 was considered statistically significant.

#### 3. Results

Among 714 identified women, 308 (43.1%) completed the questionnaire. Of these respondents, 208 (67.5%) completed the questionnaire after the first invite and 100 (32.5%) after the second. The response rate did not depend on delay between procedure and questionnaire (t = -0.05, P = 0.95).

The mean age of all patients at the time of sterilization was  $43.1 \pm 3.8$  years (range 24–57); however, 8 (2.6%) participants were younger than 35 years when they underwent the procedure.

Overall, 222 (72.1%) participants underwent a laparoscopic procedure, 67 (21.8%) the Essure procedure, and 19 (6.2%) a sterilization procedure during a cesarean. Between 2008 and 2012, the number of patients undergoing laparoscopic sterilization decreased, whereas the Essure procedure increased in frequency (Fig. 1). Table 1 shows the participants' demographic characteristics and information on contraception and sterilization methods.

The overall success rate of the sterilization was 100%; no patients conceived after the procedure. Nine (2.9%) participants reported that they would not opt for sterilization again, all of whom had experienced post-sterilization problems (e.g. menorrhagia, dysmenorrhea, back pain, and abdominal pain). Only 4 (1.3%) reported that they regretted their decision to undergo sterilization. Because of this small number of patients with regret, it was not possible to assess the correlation between regret and risk factors. Among the four women expressing regret, two had new partners and wished to become pregnant, one stated that post-sterilization problems were the cause of regret, and one did not

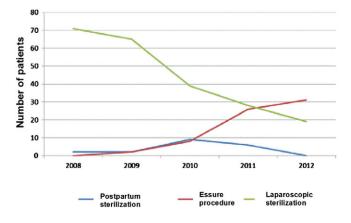


Fig. 1. The prevalence of the three different types of sterilization used between 2008 and 2012.

#### Table 1

Characteristics of participants (n = 308).

characteristics of participants (n = 500).	
Characteristics <sup>a</sup>	Value <sup>b</sup>
Age at time of sterilization, y	$42.9\pm 3.6\ (2653)$
Laparoscopic sterilization ( $n = 222$ )	39.3 ± 3.5 (35-53)
Essure procedure $(n = 67)$	$39.9 \pm 2.9 (35 - 47)$
Postpartum sterilization $(n = 19)$	$33.5 \pm 4.7 (26 - 44)$
Employment	
Employed	262 (85.1)
Unemployed	34 (11.0)
Other	12 (3.9)
Marital status	. ,
Married	206 (66.9)
Civil partnership	74 (24.0)
Divorced	15 (4.9)
Widowed	7 (2.3)
Single	6 (1.9)
Number of children	2 (0-5)
Highest education level	
Primary school	18 (5.8)
High school	167 (54.2)
Higher level of education	123 (40.0)
Religion	
Christian	240 (77.9)
Atheist	31 (10.1)
Orthodox Catholic	3 (1.0)
Undeclared	34 (11.0)
Sexual activity	
Twice or more a week	154 (50.0)
Once a week	74 (24.0)
Once every 2 weeks	40 (13.0)
Once a month	12 (3.9)
Less than once a month	6 (2.0)
Inactive or undeclared	22 (7.1)
Sterilization reason	
Permanent contraception	194 (63.0)
Unable to use other contraceptive methods	95 (30.9)
Medical indication	13 (4.1)
Bad relationship with partner	3 (1.0)
Financial situation	3 (1.0)
Autonomy on decision	
Decision made after consulting a partner	185 (60.1)
Independent decision	123 (39.9)
Satisfied with informed consent	280 (90.9)
Post-sterilization problems <sup>c</sup>	13 (4.2)
Previous contraception	
Oral hormonal contraception	108 (35.1)
No contraception used	108 (35.1)
Barrier contraception	43 (13.9)
Other	49 (15.9)
Change in marital status	
None	278 (90.2)
New partner	9 (2.9)
Divorced	6 (1.9)
Undeclared	15 (5.0)
	/

<sup>a</sup> At time of the questionnaire unless indicated otherwise.

<sup>b</sup> Values are given as mean  $\pm$  SD (range), number (percentage), or mean (range).

<sup>c</sup> Menorrhagia, dysmenorrhea, back pain, abdominal pain, decline in libido, low level of productivity, problems in relationship, or psychological problems.

state a reason for regret. All women who either reported regret or would not choose sterilization again had undergone the laparoscopic sterilization procedure.

The mean age of participants reporting that they would not opt for sterilization again was 44.1  $\pm$  2.0 years (range 42–47) compared with 42.8  $\pm$  3.5 years (range 29–53) for those who did not report regret or those who would opt for sterilization again. The age of women reporting that they would not opt for sterilization again and that of participants who would undergo sterilization again did not differ (t = -0.8, P = 0.11). The independent variable with the strongest positive correlation with participants reporting that they would not opt for sterilization again was a post-sterilization problem ( $\chi^2 = 9.0$ , P = 0.003).

Women who would not opt for sterilization again had a significantly higher Zung score than did those who would undergo the procedure again ( $\chi^2 = 7.2$ , P = 0.028) (Fig. 2).

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