

The evaluation of regret status in women following tubal ligation in Turkey

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Summary

Background: Tubal ligation (TL) is increasingly common worldwide. Women may regret after undergoing this permanent form of contraception. This study aimed to investigate the regret rate and the causes of regret in women following TL in Turkey. **Materials and Methods:** This questionnaire-based study included 253 women interviewed via telephone at least one year after TL. The women were grouped as regretful (n=31), satisfied (n=170), and undecided (n=52) according to their answers to two questions. The ones who were undecided were excluded from the study. The comparison between the answers of regretful and satisfied women were performed using the Student *t*-test and the Chi Square test. **Results:** The rate of regret after TL was 12-15%. The factors increasing the regret rate were TL before the age of 30, absence of spouse's support, and the thought of inability to have children in future. The percentage of patients stating that they accepted the TL procedure without comprehending its permanent nature or experienced health problems after TL was higher among less-educated women and these were the factors increasing regret rates. **Conclusions:** TL should be performed in women older than 30 years, after an adequate amount of information suited to the educational level of the patient and with full support of the patient's spouse.

Key words: Female sterilization; Regret; Tubal ligation.

Introduction

Tubal ligation (TL) is a common contraceptive method worldwide that ensures effective contraception. It has been the contraceptive method of choice of more than ten million women in the USA where 27% of married women aged 15-44 years have undergone TL [1]. Performed strictly adhering to the available standards, it has minimal side effects; it also requires no long-term follow-up, and provides an effective measure against pregnancy [1, 2].

There are as many women who regret TL as those who are satisfied by this permanent contraceptive method. As this method becomes widespread worldwide, the number of women who regret this procedure has also increased. It has been shown that there is an inverse correlation between the age of patient at the time of the procedure and regretting the procedure due to this decision [1]. The reasons of regret and their order of significance may vary by a country's socio-cultural structure and value judgment of people living in that country. A Brazilian study reported that a low number of having children, the timing of sterilization, and partner change after TL were the factors effecting regret rates [3]. In an Indian study women cared about partner participation in decision for sterilization and such a participation decreased regret rates significantly [4]. In addition to somatic problems including menstrual disorders and waist and abdominal pain, psychosocial problems such as feel-

ing of guilt, religious dilemmas, and change of opinion over time are also causes of regret after TL [5].

Although TL is considered a permanent method, reversal of fertility is still possible via surgical tubal reversal or IVF and embryo transfer. However, both of these two solutions are invasive, time-consuming, and expensive [1, 6]. Thus, exploring societies' psycho-socio-demographic profiles and defining the underlying causes of regret are essential to prevent regret after TL. As far the present authors know, no studies yet have been performed to investigate the causes of regret after TL in Turkey. They aimed herein to determine the regret rate and the causes of regret after TL in a western region of Turkey where the rate of contraceptive use is the highest among all regions (80%) [7].

Materials and Methods

A questionnaire-based study was conducted on Merkez Efendi State Hospital and Şifa University, Department of Obstetrics and Gynecology. The study was approved by Ethics Committee of Celal Bayar University.

Among women who had undergone TL at least one year ago, those who could be reached via telephone call were asked some questions at both centers after agreeing to participate in the study. Women who had undergone TL for a compelling reason, such as a disorder precluding pregnancy, were excluded. Two questions were asked to assess the regret status: the question "which of the following statements accurately express your current feelings after

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Table 1. — Shows how satisfied and regretful women were determined. For both questions, those choosing the first choice were grouped as “satisfied” and those choosing the second choice as “regretful”. Other combinations were deemed as undecided.

	Which of the following statements accurately express your current feelings after the TL operation?			
	1) It was a correct and wise decision n (%)	2) It was a wrong decision n (%)	3) I have no idea n (%)	Total
Would you decide the same way if you had a chance to decide again?				
1. Yes	170 (67.19)*	6 (2.37)	15 (5.92)	191 (75.49)
2. No	7 (2.76)	31 (12.25)**	6 (2.37)	44 (17.39)
3. I have no idea	12 (4.74)	1 (0.39)	5 (1.97)	18 (7.11)
Total	189 (74.70)	38 (15.01)	26 (10.27)	253 (100)

*Satisfied, **regretful, * and ** others: undecided.
Percentage calculated in 253 women.

the TL operation?” was presented with three answers including: 1) it was a correct and wise decision, 2) it was a wrong decision, and 3) I have no idea. The second question “would you decide the same way if you had a chance to decide again?” was presented with three answers as 1) yes, 2) no, and 3) I have no idea. The patients were grouped by their answers; those who replied to both questions with the first choice were grouped as regretful ones and those who chose the second choice in both questions were grouped as the satisfied ones. Other subjects were classified as “undecided” and were excluded from the study (Table 1).

To determine the socio-demographic characteristics of the study, the participants were asked about their age, educational status, the number of children lost after delivery, a spontaneous abortion, and abortion after unintended pregnancy, the method of contraception before TL. They were also asked if they worked in a salaried job. Condom, intrauterine device, and oral contraceptives were considered modern contraceptive methods.

To determine the causes of regret, the participants were asked about the number of living children, age at the time of TL, and partner change or child loss after TL. The TL method and timing were as follows: at the time of cesarean section, via laparoscopic technique (within 45 days postpartum / after 45th day postpartum), or via mini-laparotomy (within 45 days postpartum / after 45 days postpartum). The question to find out the person who decided to undergo TL was presented with choices as 1) myself, 2) my husband, 3) my physician, 4) my social environment, and 5) me and my husband. The question “did you know that TL is a permanent contraceptive method before you underwent it?” was answered with either “yes” or “no”. The participants were required to give either of the answers “yes”, “no”, or “I have no idea to the questions” to “Do you think that TL caused a health problem in you?” and “Was it unpleasant to learn that you would not have children?”

Statistical analysis

The statistical package SPSS for Windows 15.0 was used to analyze the data. Statistical comparisons between groups were performed using the *t*-test for independent groups and chi-square test for categorical variables. Frequency count, percentage, mean, and standard deviations were used to describe data. *P* values less than

Table 2. — Parameters used for evaluating satisfaction and their percentages.

Parameters	Satisfied (n=170) Number of women (%*)	Regretful (n=31) Number of women (%**)	<i>p</i> value
Working in a salaried job	42 (24.7)	5 (16.1)	0.29
Not working in a salaried job	128 (75.3)	26 (83.9)	
Having a history of curettage	45 (26.5)	6 (19.4)	0.42
Not having a history of curettage	125 (73.5)	25 (80.6)	
Having child loss after delivery	16 (9.4)	3 (9.7)	0.96
Not having child loss after delivery	154 (90.6)	28 (90.3)	
Having a history of abortus	39 (22.9)	5 (16.1)	0.39
Not having a history of abortus	131 (77.1)	26 (83.9)	
Having used a modern contraceptive method	119 (70.0)	21 (67.7)	0.61
Not having used a modern contraceptive method	51 (30.0)	10 (32.3)	
<i>Educational level</i>			
Primary school or lower	109 (64.1)	25 (80.6)	0.07
Secondary school or higher	61 (35.9)	6 (19.4)	
<i>Mode of TL procedure</i>			
Simultaneous with the cesarean section	100 (58.8)	22 (71.0)	0.40
Laparoscopic	59 (34.7)	7 (22.6)	
Laparotomy	11 (6.5)	2 (6.5)	
<i>The person who decided TL</i>			
Myself	65 (38.2)	15 (48.4)	0.009
Me and my husband	92 (54.1)	8 (25.8)	
Other (my husband, physician or social environment)	13 (7.7)	8 (25.8)	
Age ≤ 30 at the time of TL	35 (20.6)	16 (51.6)	<0.001
Age > 30 at the time of TL	135 (79.4)	15 (48.4)	
Patients who were aware that TL was permanent	164 (96.5)	20 (64.5)	<0.001
Patients who were not aware that TL was permanent	6 (3.5)	11 (35.5)	
Patients who thought that TL caused health problems	19 (11.2)	20 (64.5)	<0.001
Patients who did not think that TL caused health problems	148 (87.1)	10 (32.3)	
Undecided	3 (1.8)	1 (3.2)	
Patients who were unhappy due to inability to conceive	14 (8.2)	14 (45.2)	<0.001
Patients who were not unhappy due to inability to conceive	154 (90.6)	14 (45.2)	
Undecided	2 (1.2)	3 (9.7)	

*percentage calculated in 170 satisfied women.

**percentage calculated in 31 regretful women.

0.05 were accepted as significant.

Results

This study enrolled a total of 253 patients aged 25-49 (37.7 ± 4.71) years. Among them, 170 were satisfied, 31 were regretful, and 52 were undecided. The latter were not included in the final analysis. Among 201 women, the percentage of regretful ones was 15% (12% when undecided

Table 3. — *Evaluation of the number of children by satisfaction and educational level.*

Parameters	1-3 children (n=151) Number of women (%)*	≥ 4 children (n=50) Number of women (%)**	<i>p</i> value
Satisfied	133 (88.1)	37 (74.0)	0.017
Regretful	18 (11.9)	13 (26.0)	
<i>Education level</i>			
Primary school or lower	61 (40.4)	6 (12.0)	<0.001
Secondary school or higher	90 (59.6)	44 (88.0)	

* percentage calculated in 151 women; ** percentage calculated in 50 women.

ones were included). There was no statistically significant difference between the age of the satisfied ones (37.5 ± 4.6) and regretful ones (36.9 ± 4.3) ($p = 0.49$). All participants were married and none experienced partner change after TL. No significant difference was found between the two groups with respect to the rates of working in a salaried job, curettage, abortion, child loss after birth, educational level, TL method, and use of modern contraception method before TL (Table 2). None of the study participants lost her child after TL. All TL procedures performed via laparoscopic or mini-laparotomy techniques were performed after the 45th day postpartum.

The satisfaction rate was higher in the women who had spouse's support while deciding TL. The regret rate was higher in those with a TL procedure before the age of 30 years. Knowing that TL was irreversible significantly reduced the regret rate in women. The satisfied group had a significantly lower percentage of women who thought that TL caused health problems and were displeased since they would not be able to have children in future (Table 2). The satisfaction rate was significantly lower in women having four or more living children, while the rate in the individuals with lower education level (primary school graduate or lower) was significantly higher (Table 3).

Among 39 women who underwent three or more cesarean sections, 31 (79.5%) were satisfied with TL decision and eight (20.5%) were regretful; among the remaining 162 women, 139 (85.8%) were satisfied and 23 (14.2%) were regretful. These figures were not significantly different ($p = 0.32$). Thirty-five (26.1%) of 134 women with a low educational level and four (6%) of 64 women with a high educational level (secondary school graduate or higher) thought that TL caused a health problem ($p = 0.001$). While all women with a high educational level knew that TL was a permanent method, 17 (12.7%) of the women with a lower educational level stated that they did not know that TL was permanent ($p = 0.02$). The time after TL was longer in the regretful group compared to the satisfied group (5.61 ± 3.34 and 2.84 ± 2.47 , respectively; $p < 0.001$).

Discussion

TL has become increasingly common worldwide. More than 600,000 women in the USA prefer this method as a means of contraception each year [8]. As such, unnecessary cesarean sections are even performed as an opportunity for carrying out TL [3]. This has led to an increase in the number of women regretting TL accepted as a permanent contraceptive method. TL is currently the third most common contraceptive method (8.3%) after intrauterine device (16.9%) and condom (14.3%) in Turkey and increasingly used with each passing year [7]. The worldwide rate of women who regret TL ranges between 2% and 13% [4]. This study was the first to investigate the regret rate and the reasons of regret after TL among women in a sample population from Turkey and found that 12-15% of women undergoing that operation were regretful. The regret rate was higher in those who underwent the procedure before the age of 30 and without the spouse's support. The women were more likely to regret as more time after TL passed. The women who thought that they suffered health problems after TL and stated that they accepted the procedure without being informed or knowing that the TL procedure is permanent had a higher percentage among women with low educational level, which was a factor associated with a high regret rate. Unhappiness owing to the feeling that there would be no future opportunity to have children was another factor for regret.

In the USA the likelihood to regret TL is two times greater in women younger than 30 years of age compared to those who are older than 30 years. In those women the request of being informed whether tubal passage could be reinstituted in future and the rates of giving consent to surgical treatment for doing so or attempting IVF were also higher [1]. Also in the present study, undergoing a TL procedure at the age of 30 or before increased the regret rate. Psychosocial changes that occur in time may increase the feeling of regret [5]. Partner change and child loss were also effective on regret rates, although they were not common in the present study [3]. Mathematically, the younger a patient at the time of TL, the higher the likelihood and the rate of regretting TL will be, and the more time passing after TL will elapse until the older ages when the fertility is lost. This hypothesis was supported in the present study by an increased time after TL in regretful ones.

TL is preferred in a far greater extent in women delivering a baby via cesarean section compared to those who deliver via normal vaginal route. In addition, performing TL at the same sitting with cesarean section reduces extra cost of hospitalization and saves time [9]. The present authors found that TL performed simultaneously with cesarean section was more prevalent, although it did not increase the satisfaction level. Multiple repeated cesarean sections increase the risk of uterine rupture and intraoperative complications [10]. Considering this information, one would

expect a lower regret rate in women undergoing three or more cesarean sections. However, the present observations were not consistent with this theory. In the USA, TL is more preferred than intrauterine devices (IUD) in the postpartum hospitalization period even among younger women afraid of regret. Lower preference given to IUDs despite a comparable contraceptive efficacy with TL and the opportunity of being retrieved whenever needed has been explained by lack of adequate information offered to patients. Utilizing the contraceptive methods that are temporary but have a high efficacy at a first step is expected to reduce the regret rates [9]. Nevertheless, the present study showed that trying a modern method of contraception such as IUD or oral contraceptives before proceeding with the TL operation had no positive effect on satisfaction level. Likewise, there was no significant difference in satisfaction level among women who had to undergo curettage as a result of a failed previous contraception method. These results may suggest that women may have not had a satisfactory opinion regarding their options for contraception before embarking a permanent contraceptive method.

Malhotra *et al.* [4] suggested that deciding TL together with the spouse reduced regret rate in Indian women. They explained this finding as a cultural trend brought about by a male-dominant society. The present authors also concluded that the support of spouse increased the level of satisfaction. They suggest that the sense of relief provided by sharing responsibility in a decision concerning the future brought about these results.

Kariminia *et al.* [11] advocated that having more than two children was protective against regret. As already expected, the present study detected a higher regret rate in women who were unhappy because of the thought of being unable to have children in the future. Although some reports have suggested that having a low number of children increased regret rate, they could not confirm this finding [4, 12]. In contrast, the regret rate was higher among those who had four or more children. The present authors noted that the women having four or more children had a lower educational level. Among the less-educated women, the percentage of those who stated that they accepted TL without knowing that it was a permanent method was higher than higher-educated women. Again, the percentage of those who claimed to experience health problems after TL was higher among the less-educated women. As already known, somatic disorders including menstrual irregularities, abdominal, and pelvic pain may ensue after TL. In addition, the feeling of inadequacy and guilt brought about by loss of fertility, as well as changing attitude to life over time, psychosocial alterations, and health problems due to TL affect the satisfaction level [5]. However, there is still a lower satisfaction level despite higher number of children, presence of persons who did not know that TL is an irreversible technique, and a greater rate of those complaining about

health problems after TL among less-educated women raised the question “is the dissatisfaction from TL perceived as somatic problems?” All these information suggest that there may be a direct correlation with educational status and satisfaction level and those women may not have comprehended very well what TL offers to them.

Partner change, child loss, and timing of TL have been reported as the factors increasing the feeling of regret [3]. However, the present authors could not enrol women having these characteristics. All child losses dated prior to sterilization and none of the participants experienced partner change. All laparoscopic and mini-laparotomy TL procedures were performed after the 45th day postpartum. The present authors also aimed to grade the regret level of the participants. For this reason, they used the “Decision Regret Scale” that assesses regret status after a medical decision [13]. Nevertheless, they could not use it in this study since it lacks equivalence and validation in Turkish society. They therefore could only classify the patients as regretful ones and satisfied ones.

It should be remembered that in studies as such, there are more women that are satisfied about being protected against unintended pregnancies and the side effects of temporary contraceptive methods than those who are regretful [8]. The present authors attempted to evaluate the causes of regret among the women undergoing TL. There is a need for studies that look at TL from different perspectives in order to more comprehensively assess what TL means for women. It is also necessary to determine the regret rate for not selecting a permanent sterilization method in women who have to undergo curettage for an unintended pregnancy upon being unable to practice an effective means of contraception.

Conclusion

Undergoing TL at a younger age, absence of spouse's support in decision of TL, and a low educational level are the factors that increase the sense of regret in women undergoing TL. To enhance the satisfaction level, TL should be performed in women older than 30 years, after an adequate amount of information suitable to the educational level of the patient is provided and a full support of the patient's spouse is ensured.

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