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ORIGINAL CONTRIBUTIONS

Assessment of Contraceptive Counseling and Contraceptive Use in Women After Bariatric Surgery

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Abstract

Background Reproductive-aged women are, according to American and European guidelines, recommended to avoid pregnancy for 12–24 months after bariatric surgery. Oral contraceptives may have suboptimal efficacy after malabsorptive bariatric procedures.

Aim The aim of this study was to assess contraceptive use pre- and postoperatively in women who underwent bariatric surgery in two obesity clinics in The Netherlands. Also, the recall of contraceptive and pregnancy counseling was investigated.

Methods A validated questionnaire was performed among women aged 18–45 years who underwent bariatric surgery from October 2017 through August 2018.

Results In total, 230 women were eligible for final analysis. Postoperatively, 60% used safe contraception, 16.1% unsafe contraception, and 23.9% no contraception. In this study, 43.7% of women using a potential unsafe contraceptive method preoperatively switched to a safe method of contraception postoperatively ($p < 0.0001$). Only 62.6% of women confirmed to have received contraceptive counseling, mainly preoperatively. The odds ratio for receiving contraceptive counseling and using safe contraceptive methods compared with not receiving contraceptive counseling was 2.20 (95% CI, 1.27–3.79; $p = 0.005$). Eighty-three percent confirmed that they have received counseling regarding delaying a pregnancy, and 52.6% were familiar with the recommendation to avoid a pregnancy for 24 months postoperatively.

Conclusions In our study, 60% of women are using safe contraception postoperatively. Contraceptive counseling is suboptimal as 62.6% recall receiving counseling. Those who confirmed receiving counseling were more likely to use safe contraception after bariatric surgery. More counseling and monitoring in the postoperative and in the outpatient setting is recommended.

Keywords Bariatric surgery · Gastric bypass · Contraception · Counseling · Pregnancy

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Introduction

Bariatric surgery is a safe and effective treatment for morbid obesity. Approximately 50% of women undergoing bariatric surgery are of reproductive age [1–3]. The American College of Obstetricians and Gynecologists (ACOG) and the American Society of Metabolic and Bariatric Surgery (ASMBS) [4] recommend preventing pregnancy during the first 12–24 months following bariatric surgery [5–7]. The interval of 12–24 months is important since the initial months following surgery are associated with rapid weight loss, which could potentially cause adverse effects to a pregnancy, such as intrauterine growth restriction, anemia, and neural tube defects due to maternal nutritional status. Pregnancies occurring sooner than 24 months after bariatric surgery were associated with a higher incidence of preterm deliveries [6]. Furthermore, several international cohort studies reported an increased risk

for significant maternal anemia and an increase in small-for-gestational-age babies for women with prior bariatric surgery when compared with BMI-matched controls. In these studies, there was no difference in the incidence of congenital malformations between the two groups. On the other hand, these studies also showed a decreased risk for maternal gestational diabetes mellitus, a decreased incidence of preeclampsia, and a decreased incidence of emergent cesarean delivery for women after bariatric surgery compared with BMI-matched controls [8–11].

The altered reproductive hormone profile associated with morbid obesity seems to reverse, either partially or totally, after bariatric surgery. This may result in restoration of the normal ovulation and enhanced fertility. The risk of an unplanned pregnancy may therefore be increased after bariatric surgery, and the use of adequate contraception for women who undergo bariatric surgery is important [12].

The European Society of Contraception (ESC) and Centers for Disease Control (CDC) medical eligibility criteria for contraceptive discourage the use of combined oral contraceptives (COCs) or progesterone-only pills (POPs) in postbariatric patients, due to possible decreased efficacy secondary to malabsorptive procedures [13, 14]; however, adequate evidence is limited to a few pharmacokinetic studies.

Andersen et al. found no significant differences in basal levels of estradiol, estrone, testosterone, and progesterone compared with non-operated obese patients [15]. Victor et al. demonstrated significantly lower plasma levels of both norethisterone and levonorgestrel, suggesting a reduced absorptive capacity and risk for contraceptive failure [16]. Both studies, however, were performed in women who had undergone jejunoileal bypass, a procedure that is no longer performed.

Recently, Ginstman et al. reported no clinically significant changes in etonogestrel pharmacokinetics after Roux-en-Y gastric bypass (RYGB), suggesting that oral desogestrel (which is converted to the active metabolite etonogestrel) may be used by women after the procedure; however, the sample size was limited and the lack of sample size calculation limits the ability to draw conclusions. These results need confirmation in larger studies [17].

Mengesha et al. reported in a cross-sectional study that 66% of 363 reproductive-aged women in the USA after bariatric surgery, recruited through Facebook, used a contraception method postoperatively, of which 27% were oral contraceptives [18]. In Sweden, Ginstman et al. reported, using a questionnaire study, that in 563 women aged 18–45 years who underwent bariatric surgery, 70.1% used any contraceptive method, of which 15.5% were oral contraceptives, and 3% reported becoming pregnant postoperatively in spite of using contraception. Also, 24.8% actively stated that they did not receive any contraceptive advice postoperatively [19].

In Belgium, Luyssen et al. found that in 71 women of reproductive age who underwent bariatric surgery, the usage of short-acting hormonal contraceptives decreased from 39.4% preoperatively to respectively 27.1% and 14.9% at 6 and 12 months postoperatively. Menstrual cycle and sexual behavior did not differ before and after surgery [20].

As there is little information known and the possible risk of an unplanned pregnancy after bariatric surgery, the aim of this study was to prospectively assess contraceptive use pre- and postoperatively in women who underwent bariatric surgery in two obesity clinics in The Netherlands. Also, we investigated the recall of contraceptive and pregnancy counseling given during the bariatric care program in these clinics.

Methods

Study Population

From October 2017 until August 2018, a web-based questionnaire was sent to all women aged 18–45 years who underwent a bariatric procedure within the last 5 months, in the obesity clinics of Ziekenhuisgroep Twente (ZGT) and Medical Center Leeuwarden (MCL), in The Netherlands. A pregnancy delay of 24 months postoperatively is recommended in these obesity clinics. In the bariatric care program of both clinics, contraceptive and pregnancy counseling is given preoperatively verbally during the information meeting and also in writing in the information brochure. Further counseling may be given by different healthcare providers at any point in the bariatric care program; however, this is not standardized.

Women were identified and enrolled by their bariatric healthcare provider during an information meeting in the bariatric care program who explained the objective of this study and asked for a written informed consent.

Women received the questionnaire using a hyperlink by email and were deidentified in the survey database (SurveyMonkey®). Those who had not completed the questionnaire within 2 weeks were sent a reminder. Only completed questionnaires were eligible for analysis.

Questionnaire

The survey focused on contraceptive and pregnancy counseling and contraceptive use pre- and postoperatively in women of reproductive age (18–45 years). This survey was pretested at the outpatient clinic in a focus group. Ten women, who already underwent bariatric surgery, were asked to answer the questions in the questionnaire face to face with one of the researchers, and all comments were noted and used to modify the questionnaire accordingly.

Objectives

The primary objective of this study was to assess safe contraceptive use pre- and postoperatively in women who underwent bariatric surgery, defined as the percentage of women who use safe and effective contraception after bariatric surgery according to international guidelines. The use of COCs and POPs was considered unsafe. Long-acting contraceptives (injections, implants, IUDs, and pessaries) were considered safe methods of contraception.

Secondary objectives were to assess the percentage of women who switched from an unsafe contraceptive method to a safe contraceptive method after bariatric surgery and to assess the recall of contraceptive and pregnancy counseling and received information in the bariatric care program. Also, the possible relation between receiving contraceptive counseling and the safe use of contraception postoperatively is investigated.

Statistical Analysis

SPSS version 25.0 was used to analyze the collected data, using descriptive statistics. Logistic regression was used to analyze the possible relation between use of safe contraception postoperatively and the recall of contraceptive counseling. We determined covariates in the multivariate regression model that we considered potential confounders in the relationship between counseling and postoperative contraceptive use (i.e., age, civil status, education level, obesity clinic, or surgical procedure). A post hoc McNemar-Bowker test was performed to analyze the degree of switching of contraception postoperatively. The level of significance was set at $p < 0.05$.

Results

Study Population

For this study, 315 women provided a written informed consent and received a questionnaire; 249 women (79.1%) responded. In total, the results of 230 women were eligible for final analysis. The collected data of 19 women were excluded as they did not meet the inclusion criteria ($N = 5$) or the questionnaire was not filled out completely ($N = 3$). Also, women with a history of surgery for removal of the uterus, ovaries, or oviducts ($N = 11$) were excluded from the analysis as contraceptive use is not relevant for this group. Table 1 shows the baseline characteristics of the study population.

Contraceptive Method Pre- and Postoperatively

The contraceptive methods used pre- and postoperatively are shown in Fig. 1. Postoperatively, 60% of women used a safe method of contraception. In this study, 43.7% of users with unsafe contraception preoperatively switched to a safe method of contraception postoperatively ($p < 0.0001$). The use of short-acting unsafe contraceptives COCs and POPs decreased from 30.8% preoperatively to 16.1% postoperatively ($p < 0.0001$). Usage of long-acting safe contraceptives increased from 44.7 to 60.0% ($p < 0.0001$).

Table 1 Demographic characteristics of study population ($n = 230$)

Characteristics		
Age in years, median (IQR)	35.5	(11.0)
Preoperative weight in kg, mean (SD)	127.7	(17.9)
Present weight in kg, mean (SD)	107.3	(17.9)
Preoperative BMI in kg/m^2, mean (SD)	43.9	(5.5)
Present BMI in kg/m^2, *mean (SD)*	36.9	(5.7)
Civil status		
No current relationship	49	(21.3%)
Relationship	181	(78.7%)
Education level		
Low (primary school)	9	(3.9%)
Middle (high school)	169	(73.5%)
High (university or other higher professional education)	52	(22.6%)
Smoking	36	(15.7%)
Clinic		
ZGT	166	(72.2%)
MCL	63	(27.4%)
Procedure		
RYGB	60	(26.1%)
OAGB	155	(67.4%)
Sleeve gastrectomy	15	(6.5%)
Time since surgery in months, median (IQR)	1.91	(2.26)

BMI body mass index, *RYGB* Roux-en-Y gastric bypass, *OAGB* one-anastomosis gastric bypass, *MCL* Medisch Centrum Leeuwarden, *ZGT* Ziekenhuisgroep Twente

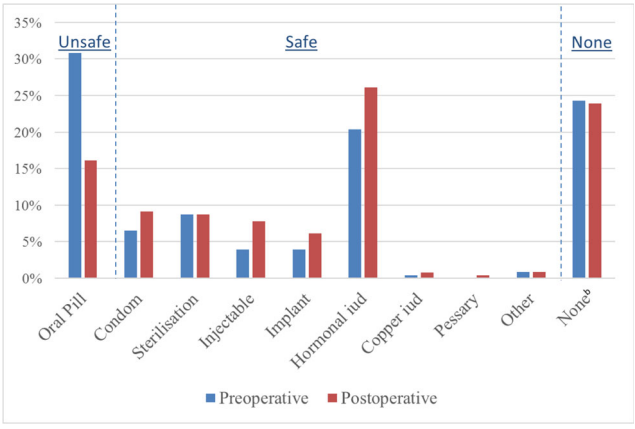

Fig. 1 Contraceptive methods used pre- and postoperatively ($N = 230$). [b]Of women using no contraception postoperatively, 89% responded to have a partner

Approximately 24% of women in this study population were not using any method of contraception postoperatively. In this group of women, 89% reported to be involved in a relationship. Also, four women using unsafe contraception preoperatively switched to using no contraception postoperatively. An overview of contraceptive use classified by safe, unsafe, or no use of contraception pre- and postoperatively respectively is given in Table 2.

Contraceptive and Pregnancy Counseling

About 63% of women confirmed to have received any counseling about contraception, and 83% about delaying pregnancy in the bariatric care program. Approximately 71% of women reported to have received information in writing regarding contraception, and 72% regarding pregnancy in the information meeting preoperatively. In Table 3, we have summarized these results from the questionnaire by healthcare provider and information source.

In this questionnaire, women were asked if they have received counseling about a delay of pregnancy postoperatively and which minimal period of time was advised for this delay. Approximately 53% of women indicated the recommended delay of 24 months postoperatively as is shown in Table 4.

None of the women was pregnant at the time this questionnaire was taken. Approximately 13% of women responded that they had the desire to become pregnant within 24 months, and 22% responded that they respected the recommended delay of 24 months with their desire to become pregnant as is shown in Table 5.

The odds ratio of receiving contraceptive counseling for using safe contraceptive methods compared with no counseling was 2.20 (95% CI, 1.27–3.79; $p = 0.005$). Women who received contraceptive counseling are more likely to use safe contraceptives. There were no relevant confounders found (age, civil status, education level, obesity clinic, and surgical procedure were checked as possible confounders).

In the overall population, 71 women confirmed to have received contraceptive counseling from one healthcare provider in the bariatric care program, and in this group, 63% used safe contraception postoperatively.

Eleven women confirmed to have received contraceptive counseling from 4 different healthcare providers, and 73% of women in this group used a safe method of contraception postoperatively. Despite this difference, we found no statistical significant relation found between receiving contraceptive counseling from more than one healthcare provider and the use of safe contraception postoperatively.

Discussion

This study in two obesity clinics in The Netherlands shows that 60% of women who underwent bariatric surgery are using a safe method of contraception postoperatively according to international guidelines. About 24% of women who underwent bariatric surgery responded not to use any method of contraception postoperatively. As the questionnaire did not include questions regarding the status of sexual activity, we could not distinguish the actual need for contraception in this population. However, it is to be noted that in this group of women, 89% reported to be involved in a relationship, though we have no information whether these relationships were heterosexual relationships and sexual active relationships.

Approximately 63% of women could confirm to have received counseling or information about contraception after bariatric surgery. These results suggest that the quality of counseling and prescribing of contraception in women who undergo bariatric surgery needs improvements.

In this study, we observed a decrease in use of oral contraceptives postoperatively; however, still 16.1% of women continued in using this unsafe method of contraception, according to international guidelines. Further pharmacokinetic studies

Table 2 Overview of contraceptive use classified as safe, unsafe, and no use of contraception pre- and postoperatively ($N = 230$)

			Postoperative			
			Safe contraception	Unsafe contraception	No contraception	Total
Preoperative	Safe contraception	*N*	103	0	0	103
		%	100.0%	0.0%	0.0%	100.0%
	Unsafe contraception	*N*	31	36	4	71
		%	43.7%	50.7%	5.6%	100.0%
	No contraception	*N*	4	1	51	56
		%	7.1%	1.8%	91.1%	100.0%
	Total	*N*	138	37	55	230
		%	60.0%	16.1%	23.9%	100.0%

Table 3 Overview of survey responses for receiving pre- and postoperative counseling in contraception and/or pregnancy ($N = 230$)

Received counseling	Contraceptive information		Pregnancy information	
	N	(%)	*N*	(%)
Yes	144	(62.6)	192	(83.5)
No	86	(37.4)	38	(16.5)
If yes, when and by which healthcare provider counseling was given[a]:				
Preoperative by:				
Surgeon	50	(34.7)	78	(40.6)
Internist	22	(15.3)	33	(17.2)
Nurse specialist obesity	58	(40.3)	88	(45.8)
Outpatient obesity nurse	72	(50.0)	105	(54.7)
General practitioner	12	(8.3)	17	(8.9)
Postoperative by:				
Surgeon	5	(3.5)	8	(4.2)
Internist	2	(1.4)	5	(2.6)
Nurse specialist obesity	14	(9.7)	24	(12.5)
Outpatient obesity nurse	22	(15.3)	28	(14.6)
General practitioner	3	(2.1)	3	(1.6)
Other healthcare providers	6	(4.2)	10	(5.2)
Information sources:				
Information meeting	102	(70.8)	139	(72.4)
Information map	47	(32.6)	67	(34.9)
Internet	43	(29.9)	43	(22.4)
Conversation	51	(35.4)	104	(54.2)
Group meeting	50	(34.7)	57	(29.7)
Other	1	(0.7)	1	(0.5)

[a] Participants could select > 1 choice

investigating whether bariatric surgery affects the pharmacokinetics of oral contraceptives are required to set this in more perspective.

Our results regarding the use of contraception are in line with the Swedish study done by Ginstman et al. ($N = 563$) in which 15.5% were using oral contraceptives postoperatively and 29.9% did not use any method of contraception [19]. In the study from the USA by Mengesha et al. ($N = 363$), these percentages were higher, respectively 27% oral contraceptives and 34% no contraception postoperatively [18].

We also found that adequate contraceptive counseling in the bariatric care program is important as this significantly improves the use of safe contraception postoperatively. However, we cannot exclude any influence of other contributing factors which were not investigated in this study.

As only 62.6% in our study could confirm to have received contraceptive counseling and only 52.6% could indicate the recommended pregnancy delay of 24 months postoperative, it is worth thinking about how to improve this.

Table 4 Overview of survey responses for delaying pregnancy ($N = 230$)

Advised delay for pregnancy	*N*	(%)
12 months	50	(21.7%)
18 months	15	(6.5%)
24 months	121	(52.6%)
Other (with remarks) - Stabilized weight	6	(3.1%)

Table 5 Overview of survey responses regarding the desire to become pregnant ($N = 230$)

Desire to become pregnant	*N*	(%)
No	149	(64.8%)
Yes, but not within 24 months	50	(21.7%)
Yes, within 24 months	27	(11.7%)
Yes, within 12 months	4	(1.7%)
Now pregnant	0	(0.0%)

It is notable that in our study, counseling was predominantly recalled as given preoperatively and by the obesity nurse and nurse specialist in the bariatric care program. Perhaps postoperatively counseling is more effective as this is the setting when it is most relevant and at this point after the operation, women may be more inclined to follow up on this. Counseling by more than one healthcare provider may decrease the risk of using unsafe contraception postoperatively; however, this was not statistically significant.

It may also be worthwhile to include general practitioners and pharmacists in the outpatient setting in monitoring whether women who underwent bariatric surgery are using safe contraception as they usually prescribe and dispense this contraception. For this reason, it is important that obesity clinics actively inform these healthcare providers about the bariatric surgery after discharge from the hospital. Furthermore, bariatric surgery should be registered as a condition in the electronic medical record of all healthcare providers for these women with adequate signaling when contraindicated drugs, like oral contraception, are prescribed or dispensed.

Strengths and Limitations

The results of this questionnaire study regarding contraceptive and pregnancy counseling by whom and when, may have been affected by recollection bias as the time between participating in this study and the moment of counseling may have been too long for some women for remembering this always correctly. This study was also limited as we did not include questions in the questionnaire regarding the status of sexual activity as this may be a reason for not using contraception. Final conclusions for this group must therefore be drawn with caution.

The high response rate is the strength of this study. Therefore, the results represent a good reflection of this bariatric surgery population in the two obesity clinics in The Netherlands investigated. The differentiation by whom and when counseling was given, is informative and strengthens this study, which we have used to formulate specific recommendations for improvements in counseling regarding contraception after bariatric surgery.

Conclusions

In this questionnaire study, we found that a substantial part of women who underwent bariatric surgery is using potential unsafe or no contraception. In this way, they are not only at risk for an unwanted and unplanned pregnancy, but because of the weight loss in the early months after bariatric surgery also at risk for a pregnancy with adverse effects and complications. Contraceptive and pregnancy counseling is suboptimal, and improvements are necessary as we have demonstrated that this is correlated with the use of safe contraception postoperatively. We suggest implementing more counseling and monitoring in the postoperative and in the outpatient setting. Adequate signaling in the electronic medical information systems for contraindicated drugs like oral contraception after bariatric surgery could be helpful for better monitoring and guidance.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest The authors declare that they have no conflict of interest.

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