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ORIGINAL ARTICLE

Effect of Sleeve Gastrectomy on Infertility in Females With Polcystic Ovaries Syndrome

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Abstract

Background: **A 9 % fraction of the people who contributed were asymptomatic. It had also been inquired of the participants as to whether or not they suffered from any other medical ailments. A 52.5 % of the women were fat, although only 29 % of them had any other medical issues. The patient's self-assessment was utilized as the only basis for determining whether or not a patient was obese. Fourteen percent of the various contributions were diagnosed with thyroid illness.**

Aim: **This find out about aimed to look at and to discover the impact of a gastric sleeve on the manage of weight problems and consequently enhancing polycystic ovary syndrome (PCOS).**

Patients and methods: **This cohort find out about took region in General Surgery out-patient sanatorium and General Gynecology and Infertility outpatient clinic, Al Azhar University hospitals. The learn about was once performed in the length from January 2022 to January 2023. The find out about blanketed 100 females; inclusion standards protected the following: overweight girls struggling from infertility due to PCOS (following the elimination of many potential causes of infertility), who have undergone bariatric surgical treatment, or who have intentions of doing so, ranging in age from 22 to 40 years old, and whose BMI after surgery is less than or equal 35 kg/m2.**

Results: **Seventy five percent of the women discovered an enchancment in their PCOS signs and symptoms afterward operation; 75 % of the overall group found out that their fertility had increased after using the medication. Concerning the postoperative problems, the vast majority of the patients (71 %) no longer had any issues after the operation. The remaining patients suffered from hemorrhage, gallstones, infection, and embolism, respectively.**

Conclusion: **It has been proven that 52 % of ladies had a normal cycle earlier than the surgery, which expanded to 80 % following the surgery. Concerning the flow of the menstruation, 48 % of the ladies had a regular float earlier than the operation, which accelerated to 61 % after the operation.**

Keywords: Females, Infertility, Polcystic ovaries, Sleeve gastrectomy

1. Introduction

Polycystic ovary syndrome (PCOS) is a frequent circumstance that has global repercussions.[1] It is more common in younger adults and women in their middle years. PCOS can have a significant impact on a women's fertility and can elevate the likelihood that she will have an abortion.[2] Furthermore, weight issues and insulin resistance are the most frequent threat elements for PCOS.[3,4]

PCOS has been linked to hyperandrogenism, polycystic ovaries, ovulatory dysfunction, and huge thyroid dysfunction. The presence of PCOS is associated with an increased hazard of endometrial hyperplasia or diabetes, cancer, and cardiovascular disease.[4] The exact cause of PCOS has not been identified; nonetheless, it is frequently linked to metabolic disorders.[5]

Changing patients' lifestyles and providing them with appropriate medication are the two primary components of the PCOS treatment plan for certain patients.[6] The changes in lifestyle are aimed at reducing body weight, which can result in a sizeable enhancement in insulin sensitivity and, as a

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consequence, the symptoms of PCOS.[7] Metformin is the pharmaceutical treatment that is used the most frequently, and in addition to controlling weight problems, it also tries to improve insulin sensitivity.[8]

An improved physique weight that outcomes in a physique mass index (BMI) of 30 kg/m^2 or above is considered to be obese.[5] In Saudi Arabia, the incidence of weight disorders is expanding at an alarming rate across all age groups and among people of both sexes.[9] As a result, Saudi women who struggle with their weight will have a greater risk of developing PCOS and its associated difficulties. It can elevate the hazard of menstruation issues as well as the possibility of fertility.[5] Patients who suffer from a variety of endocrine problems are also greater incidence of obesity compared with the overall population. Alterations to one's way of life, medical treatment, and even surgical procedures[10] are all viable options for the management of obesity.

Although managing obesity can help alleviate some of the symptoms of PCOS, it is not yet known which treatment for obesity will have the greatest influence on PCOS.[11]

In addition to alleviating metabolic profile irregularities, bariatric surgery offers a long-term solution for sustainable weight loss in obese persons.[12] As a result of the developments that have been made in laparoscopic methods, bariatric treatments have improved to the point that they are now a popular option for PCOS patients who are overweight and who suffer from infertility.[13] Bariatric strategies can be broken down into three primary classifications: mal-absorptive, including biliopancreatic diversion; restrictive, for example gastric band utility and 'sleeve gastrectomy; ' and blended, such as 'Roux-en-Y gastric bypass' (Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group, 2004). These categories are broken down further into subcategories.[10]

Current investigation has suggested that the rapid and sustained weight loss that follows bariatric surgery might enhance women's chance of getting pregnant. This weight loss may also alter both the clinical and laboratory aspects of PCOS. On the other hand, there are not a great deal of details available about pregnancy outcomes following bariatric surgery.[14] There are no statistics available at this time about the impact that sleeve gastrectomy procedures have on the signs of PCOS.[15] As a result, the purpose of this study is to determine the effect that a gastric sleeve has on the management of obesity and consequently, the improvement of PCOS.

2. Patients and methods

2.1. Study plan and settings

The Al-Azhar University Hospitals' General Surgery and General Gynecology and Infertility outpatient clinics hosted this cohort research. The learn about used to be performed in the duration from January 2022 to January 2023. The learn about was once accredited with the aid of Al-Azhar University Institutional Board Review and knowledgeable consent was obtained from all participants before beginning the investigation.

2.2. Patients

The learn about blanketed a 100 females; inclusion standards covered the following: chubby ladies struggling from infertility because of PCOS (subsequently different infertility reasons being kept out), who undergone bariatric operation or were intended to do so, ranged in age from 22 to 40, and had BMI of less than or equal 35 after the treatment. Medical conditions, age over 40, BMI after surgery of more than 35 kg/m^2, various causes of infertility, and the use of oral contraceptives were all disqualifiers.

2.3. Methods

Cases had been recruited, kept records, and monitored with exams, serum sample withdrawals, and ultrasound evaluations before, 6 months after, and a year following surgery. Results are conveyed to target audiences through personal interaction.

2.3.1. History taking

Full records used to be obtained from every instances (personal, existing, and previous medical and pregnancy records), together with length on the grounds that marriage, date on the grounds that any preceding pregnancies if existing and the number of live births and/or abortions, oral contraceptive usage, and history of infertility treatment sought. Concerning sufferers that have been recruited earlier than present process bariatric surgery, special menstrual records are taken. In sufferers who have been enrolled to the investigation following the surgery has been performed, detailed records have been collected, and all of the case's information from the device has been evaluated. This was done in order to exclude any other possible factors contributing to infertility prior to the operation.

2.3.2. Examination

BMI is determined by taking a woman's weight in kilograms and dividing it by the square of their height in meters. This is done prior to bariatric surgery, and the results are then contrasted with the BMI postoperatively at 6 months and 1 year following the procedure. In the past, people would have general physical and gynecological examinations as well as inspections for indications and symptoms of medical hyperandrogenism such as acne and hirsutism.

2.3.3. Ultrasonography

Transvaginal ultrasound: the use of a two-dimensional transvaginal ultrasound transducer with an 8 MHz frequency applied to be used to evaluate the size of the ovary (either with a computer or manually by multiplying the values of the ovarian length, width, depth, and after which multiplying via 0.52, as recommended by the International Society of Ultrasound in Obstetrics and Gynecology, or 'ISUOG'). Once upon a time, elevated ovarian extension was referred to values that were greater than 10 ml. This ensured that no cysts were present, in addition to the lack of a dominating follicle or corpus luteum.

2.3.4. Laboratory investigations

Free and total serum testosterone levels, besides sex hormone binding globulin levels, were either purchased from the patients' archives or evaluated preoperatively with an enzyme-linked immunoassay kit given by Elabscience (Cairo, Egypt). The levels have been reevaluated both 6 months and 1 year afterward the operation. The free androgen index, also known as FAI, used to be determined by first dividing the total blood testosterone level by the level of somatotropin-releasing hormone binding globulin (sex hormone binding globulin), and then multiplying the result by a constant value of 1000 and 0.

2.3.5. Bariatric technique

All sufferers who introduced anteoperatively endured fashionable laparoscopic bariatric approaches (sleeve gastrectomy) and if affected person introduced after surgery, kind of the system and any problems had been recognized from patients' files.

2.3.6. Follow up

Patients are followed for 1 year after surgery, and if pregnancy does result, the amount of time from the bariatric operation to the conception of the child is determined, and the baby's birth outcome is evaluated. In the event that a postbariatric surgical treatment woman who has a history of PCO and obesity-related infertility and who has undergone bariatric surgery within the previous 3 years goes on to have a contemporary pregnancy, the amount of time that has elapsed since the bariatric operation until the conception of the embryo is calculated, and the pregnancy effect is noticed.

2.3.7. Measurable effects

The foremost consequence was once to appraise the affect of bariatric surgical operation on the ovarian extent in PCOS chubby ladies with infertility. The secondary outcome is an investigation into the theory fee and the amount of time that has passed among the operation and the theory and the effect (if it has happened).

2.4. Statistical analyses

It used to come with a useful pattern of Saudi ladies who had undergone sleeve gastrectomy. The data used to be presented using terminology such as frequencies and genuine percentages for particular variables, whereas in contrast, the use of Fisher's specific test was more common. The term 'suggest' (or 'SD') used to be more used when referring to nonstop variables. We have assumed that anything with a P value less than 0.05 is statistically substantial. IBM Statistical Package for the Social Science (SPSS; IBM Corp., Armonk, New York, USA) was at one time utilized in order to carry out all statistical computations while utilizing model 26 for Microsoft Windows.

2.5. Ethical considerations

Prior to carrying out any kind of research method, consent from the institution's research ethics board was once requested. All participants were assured their privacy and anonymity would be protected, that participation was voluntary, and that they could stop participating at any moment. In addition, participants were given the promise that their data will be maintained private and anonymous.

3. Results

One hundred women who met the criteria for inclusion were considered for the study. The following table provides an analysis of the outcomes as well as a sociodemographic breakdown of the participants.

3.1. General characters of responders

The ages of the 100 female participants were first divided into five distinct groups, ranging from 20 to 51 years of age. The age group that represented the majority of the population (42 %) was comprised of people who were between the ages of 20 and 29. Regarding the marital status of the participants, 60 % of the girls were married. Every single sociodemographic indicator is presented in full detail in Table 1 and Fig. 1.

3.2. Diagnosis and history of polycystic ovary syndrome

The participants were questioned about their PCOS diagnosis as well as the PCOS records kept in their households. All of the patients who participated in this research had been given a diagnosis of PCOS, and 70 % of those patients came from families with a strong history of PCOS.

PCOS was diagnosed when a woman experienced more than one symptom, including difficult pregnancies, hirsutism, irregular menstrual cycles, hair thinning or loss, weight increase, or both. According to the data shown in Table 2, 9 % of the participants did not exhibit any symptoms.

Sixty-three percent of the cases were obese; the evaluation of obesity was depended on how the case as perceived their own weight (Fig. 2).

3.3. Menstruation before and after surgery

The results of the regularity and float of the menstrual cycle both before and after surgical intervention. It has been demonstrated that following the procedure, 80 % of the women returned to having regular menstrual cycles, whereas before the operation, only 52 % of the women did. In terms of the flow of menstruation, 59 % of the women had a regular discharge before the procedure, and this number increased to 80 % following the surgery, as revealed in Table 3 and Fig. 3.

Table 1. Sociodemographic data of patients.

	n	%
Age group		
20–29	42	42
30–39	38	38
40–49	14	14
50–51	6	6
Marital status		
Single	40	40
Married	60	60

3.4. Pregnancy and fertility before and after surgery

Pregnancy and fertility tests taken prior to and following operation showed that one in six women pregnant prior surgery, up from one in 15 previously, and that one in 16 conceived thereafter, a small increase from before. Following surgery, the rate of women having an abortion for the first time dropped by 4 % compared with before (Table 4, Fig. 4).

3.5. Other postoperative medical changes

Even more encouraging, 75 % of the girls reported an enhancement in PCOS signs following operation, and 75 % of the overall cohort reported an increase in fertility. When it came to problems after surgery, 71 % of patients said that they no longer had any issues. Other people were affected by hemorrhaging, gallstones, infections, and embolisms. Based on the data in Table 5, gallstones were historically the most common problem, affecting 17 % of cases (Fig. 5).

4. Discussion

PCOS is a frequent medical condition that affects women and can significantly lower their quality of life.[16] Besides an elevated hazard of monthly abnormalities over a longer period of time, PCOS might reduce a woman's fertility. It is common for women who have PCOS to be overweight; hence, it has been argued that maintaining a healthy body weight might reduce the symptoms of PCOS.[17] However, the use of gastric sleeves as a surgical treatment for obesity remains contentious in PCOS sufferers.[18]

The current study aims to investigate whether or not a sleeve gastrectomy may have an effect on the symptoms of PCOS. Seventy percent of the sufferers who were diagnosed with PCOS had a strong family history of the condition, according to the information that was released. Patients diagnosed with PCOS often exhibited many symptoms of the condition, with just 9 % of sufferers being asymptomatic. A greater incidence of PCOS was seen in females who came from families with a history of condition ($P = 0.001$).

Concerning menstruation and fertility earlier than and afterward operation, 52 % had an ordinary cycle earlier than the operation, which elevated to 80 % after the operation. Also, 59 % had an ordinary menstrual waft earlier than the operation, which accelerated to 80 % after the operation. Fifteen percent of the ladies conceived as soon as earlier

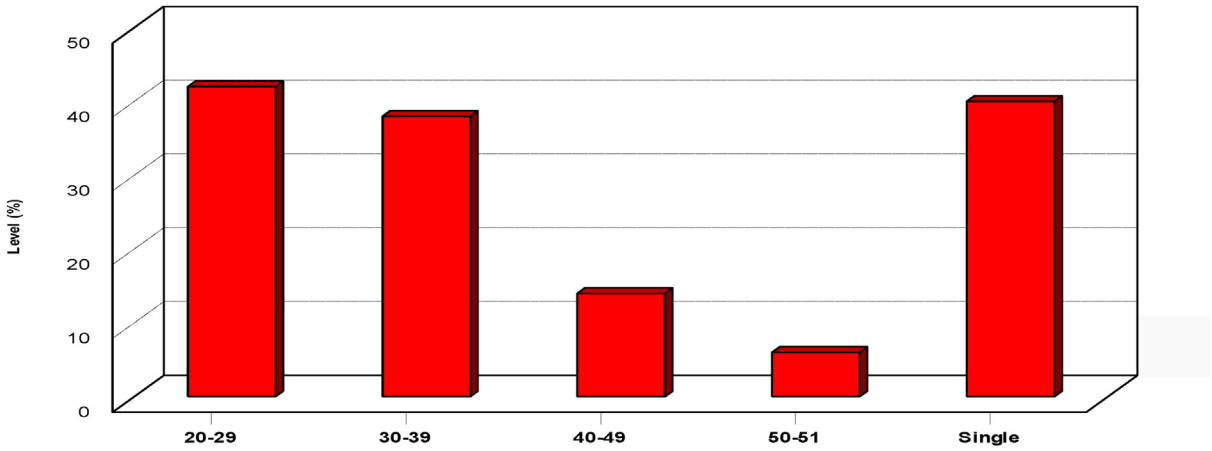

Fig. 1. Sociodemographic data of patients.

Table 2. History of polycystic ovary syndrome and the diagnosis of the condition.

	n	%
Family history of PCOS		
Yes	70	70
No	30	30
Symptoms of PCOS		
Asymptomatic	9	9
Difficult pregnancy	30	30
Hirsutism	45	45
Irregular menses	53	53
Thinning of hair or hair loss	34	34
Weight gain	63	63

PCOS, polycystic ovary syndrome.

Table 3. Changes in menstrual cycle and flow prior to and following surgical intervention.

	Before surgery		After surgery	
	n	%	*n*	%
Menstrual cycle				
Irregular	48	48	20	20
Regular	52	52	80	80
Menstrual flow				
Heavy	17	17	10	10
Light	23	23	10	10
Normal	60	60	80	80

than the operation, which barely elevated to attain 16 % afterward the surgery. Further, the range of women who had an abortion for the first time decreased from 11 to 7 % following surgery, and the range of women who had an abortion twice decreased from 7 to 2 % following surgery.

The prevalence of abnormal menstrual flow and irregular cycles was found to be considerably higher in PCOS sufferers than in non-PCOS patients in the current study ($P = 0.01$ and 0.001, respectively) for the symptoms before surgery. In PCOS sufferers, the frequency of the regular menstrual waft and period increased after surgery ($P = 0.05$ and 0.001, respectively).

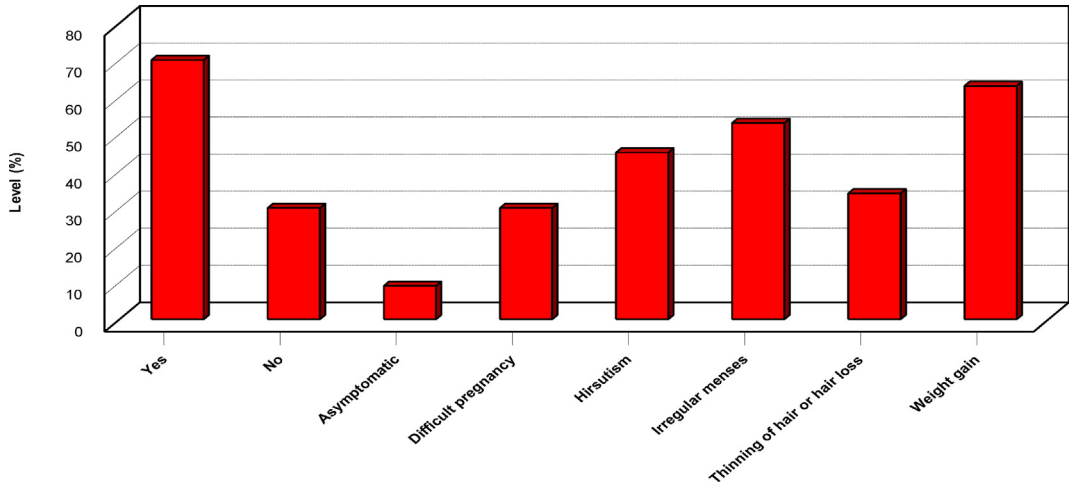

Fig. 2. PCOS history and diagnosis. PCOS, polycystic ovary syndrome.

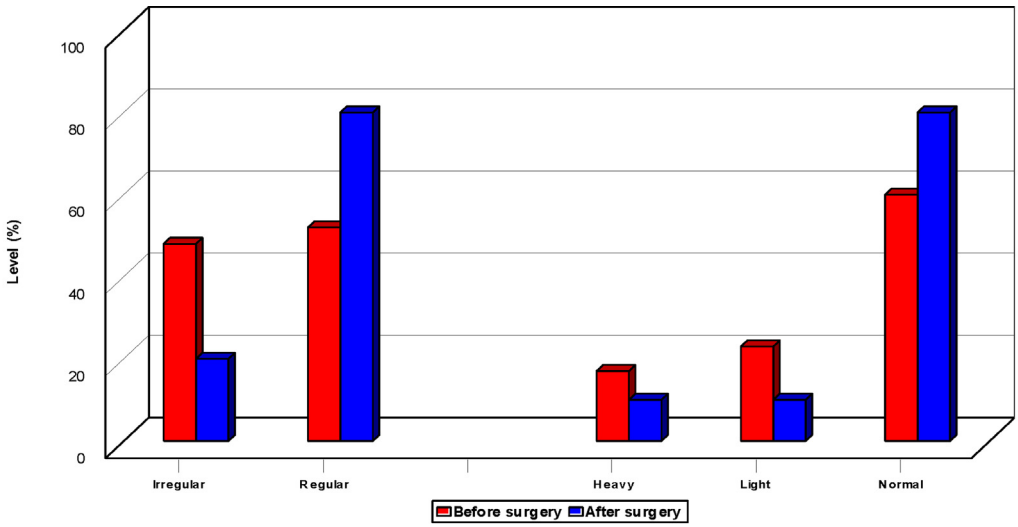

Fig. 3. Menstrual cycle and flow prior to and following surgical intervention.

Table 4. Fertility and pregnancy prior to and following surgical procedures.

	Before surgery		After surgery	
	n	%	*n*	%
Number of conceiving				
Once	15	15	16	16.2
Twice	8	8	6	6
Third	6	6	2	2
Four-time	9	9	0	0
Five or more	7	7	0	0
Never	63	63	76	56.6
Number of abortions				
Once	11	11	7	7
Twice	7	7	2	2
Third	1	1	0	0
Four-time	0	0	0	0
Five or more	1	1	0	0
Never	80	80	91	91

Table 5. Treatment and improvement of polycystic ovary syndrome, fertility improvement, and complications after surgery.

	n	%
Treatment and improvement of PCOS		
Yes	75	75
No	25	25
Fertility improvement		
Yes	75	75
No	25	25
Complications after surgery		
Bleeding	2	2
Gall stones	17	17
Infection	3	3
Embolism	1	1
Others	6	6
None	71	71

PCOS, polycystic ovary syndrome.

Three studies looked into implications of gastric sleeve surgery for PCOS sufferers' weight reduction and fertility. Bariatric surgical methods[3] have been tested in PCOS sufferers in various contexts. Based on data from 119 PCOS sufferers, they found that the majority of PCOS sufferers became pregnant following surgery, and that they experienced significant weight loss and improved control of their weight.[19]

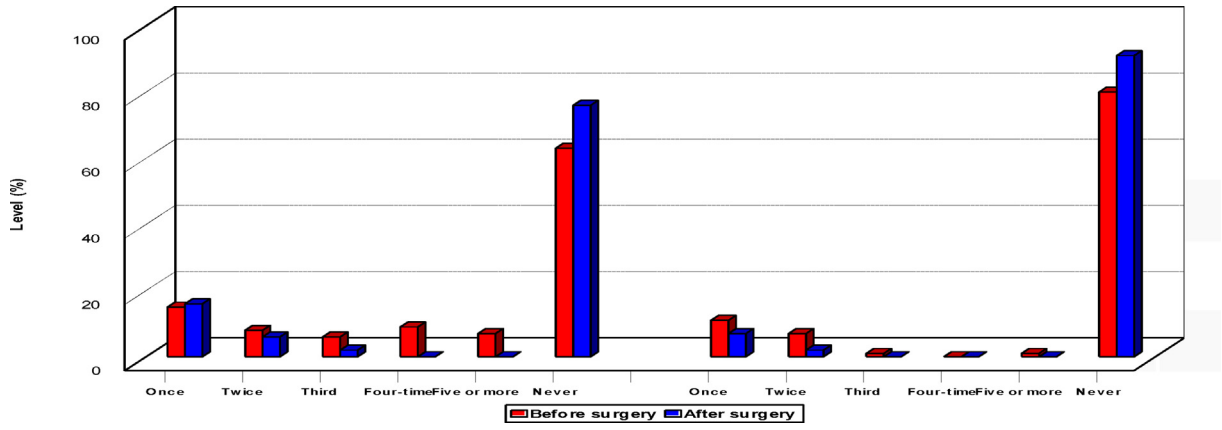

Fig. 4. Fertility and pregnancy prior to and following surgical procedures.

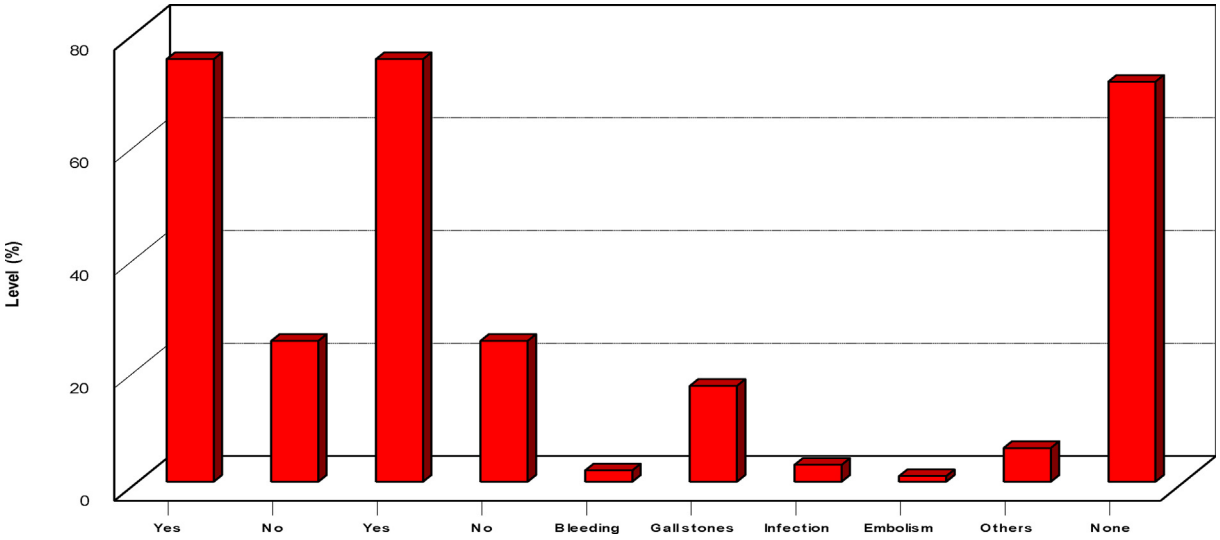

Fig. 5. Treatment and improvement of PCOS, fertility improvement, and complications after surgery. PCOS, polycystic ovary syndrome.

The findings of the latter research corroborate the current study, in which 15.2 % of the women conceived once beforehand the procedure and 16.2 % conceived once after it. Additionally, 47 % of the entire group reported an increase in fertility. Fertility and the prevalence of PCOS both increased dramatically following the procedure.

The alterations in fertility hormone in PCOS sufferers following sleeve gastrectomy were also examined.[20] Seventy-five PCOS sufferers who underwent a sleeve gastrectomy to address weight issues were safeguarded, and it was documented that PCOS and reproductive hormone levels significantly improved following surgery.[20]

These results are[20] consistent with the results of the current study, which found that after surgery, PCOS sufferers were far more likely to have regular menstrual flow and a normal cycle than they were beforehand the surgery.[20] In a study including 24 obese PCOS sufferers, Wang et al.[21] looked at the effectiveness of sleeve gastrectomy as a treatment. Postoperatively, they noted a huge discount in androgen levels, which they attributed to a dramatic amelioration of PCOS.

4.1. Conclusion

The outcomes concluded that, sleeve gastrectomy has proven positive consequences in sufferers with PCOS. It may enhance signs and signs of PCOS in phrases of glide and normal menstrual cycles, conception, a decrease in the rate of abortion, and enhancement of fertility. These favorable results need to grant clinicians with an information to inspire their girl sufferers closer to the surgical cure of weight problems once showed, so as to enhance fertility and PCOS.

Conflicts of interest

There are no conflicts of interest.

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