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Research Article

Comparison of the Results of Intragastric Gastric Balloon Application Versus Sleeve Gastrectomy on the Quality of Life in Patients Who Were Diagnosed as Asthma

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Abstract

Aim: We have aimed to compare the postoperative outcomes of asthmatic patients who have underwent laparoscopic sleeve gastrectomy (LSG) versus intragastric balloon(IGB) application.

Materials and Methods: Total of asthmatic 84 patients who have underwent LSG versus IGB due to morbid obesity between March 2019 and February 2021 in the tertiary surgery department have retrospectively analyzed. Demographic findings, global symptom scores, and length of the stay in hospital of patients were evaluated. The patients in present resarch have similar in terms of BMI, age, and gender. Statistically significant results were accepted as $p<0.05$.

Results: The mean age of the patients participating in the study were 42.32±6.51 (range 28–54), mean BMI were 42.3±6.7 kg/m² (range 41–52). There were no major complications and mortality were observed in patients. Age and gender were defined as independent risk factors by multivariant logistic regression analysis, Age, p:0.054, (OR (95%CI): 2.017), BMI, p:0.067. (OR (95%CI): 1.379), Gender was determined as p:0.110 (OR (95%CI): 0.928.

Conclusion: We have concluded that although the morbidity of sleeve gastrectomy is higher than the gastric balloon application process, LSG provides more improvement in quality of life than IGB process.

Keywords: Sleeve gastrectomy, gastric balloon, score

INTRODUCTION

Morbid obesity is common significant health problem in the world, but it is a complex and multifactorial disease that continues increasing rapidly (1). The fact that asthma and morbid obesity have a parallel increase all over the World, many researchs have work for potential relationships for both diseases. Although some studies demonstrate that both diseases may have similar origins, the majority of epidemiological and clinical studies in this area have focused on obesity as a causal factor in the development of asthma (2). The relationship between these conditions remains unclear, whether asthma influences the onset of obesity(3). While LSG (laparoscopic sleeve gastrectomy), which has become almost conventional process in bariatric surgery, plays a primary role, gastric balloon application (IGB) is currently applied in patients who have not benefited from first-line treatment (4).

The studies conducted in our hospital, it is seen that the prevalence of obesity in the adult population exceeds the critically high rate of 45%, and although the prevalence of obesity is higher in women, the rapid increase in men in recent years has been noted (1). In the United States, the prevalence of asthma in morbid obese populatıon is 14.6% and 7.9%, consecutıvely (4). Studies have shown that obesity has a dose-dependent effect on asthma risk, and also greater the body mass index (BMI) correlate with increased risk of asthma (5).

In addition to this information, the LSG procedure is more effective than IGB, but it is an irreversible procedure that can cause more morbidity. In our study, we aimed to compare the efficacy of asthma patients who underwent LSG and IGB operation with the Global general symptom (DGB) and reflux quality of life (RQS) scores (6,7).

CITATION

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MATERIAL AND METHOD

Local Ethics Committee has been approved this retrospective research (2021 / 7–decision number 151). Totally 84 patients who have applied to our clinic with morbid obesity and performed LSG and IGB procedures according to their BMI results between March 2019 and February 2021 were evaluated retrospectively. All patients also had their informed consent form read before the procedure and their consent was obtained. Necessary consultations (endocrine, psychiatry, chest, dietitian) were made for our patients who applied before the procedure, and necessary information was given to the patients for the operation. The procedures of the patients were performed by a team experienced in bariatric procedures.

Study protocol

The patients participated in the study in accordance with the Declaration of Helsinki, and approval was obtained from the local ethics committee within this framework. First of all, the Global General Symptom (GGB) questionnaire was applied to the patients, it consisted of a scale with 7 points graded upper gastrointestinal symptoms. The patients were evaluated in terms of epigastric pain, heartburn, acid regu- lation, bloating, nausea, early satiety, postprandial bloating parameters. The Quality of Life in Reflux (RQS) questionnaire was filled, which was a 5-part questionnaire consisting of 25 questions, in which emotional stress, social and physical functions, eating and drinking problems, and sleep problems were questioned. The questionnaires were repeated 12 months after the procedure.

Exclusion criteria

Psychiatric diseases and frequent exacerbations (at least 3 attacks per month) were found in the history of the patients. Demographic findings, duration of the procedure, complication rates, and hospital treatment durations of the patients who underwent the procedure were evaluated. The mean follow-up times of the patients were 1, 3, 6 and 12 months after the procedure.

Bariatric Procedures

Pre-procedural information was given to the patients, both procedures were explained, and their consent was obtained. Patients were advised to fast 12 hours before the procedure. The patients were intubated in the bariatric surgery procedure and placed in the obesity surgery position. LSG procedure was applied to the patients at a distance of 4 cm from the pylorus. In the IGB procedure, the stomach was filled with 550cc of methylene blue and a gastric balloon under sedation. After the procedure, the patients were kept under observation for 45 minutes and were sent with recommendations.

RESULTS

A total of 84 followed-up asthma patients without frequent exacerbations were included in the study. All patients agreed to fill out the questionnaire. 54 of the patients were female (64.7%) and 30 were male (35.3%), mean BMI was 42.32±6.51 (age range 28–54). The mean duration of the procedure was 55.5±8.2 minutes in LSG (range 43–84 minutes), and 18±5.6 minutes (13-48) in IGB. Bleeding was observed in the early postoperative period in 2 patients who underwent LSG in the postoperative period, and the existing bleeding of the patients was controlled with supportive treatment. No additional complication was observed in the patients who underwent IGB. The symptoms of the patients were evaluated at 1,3,6 and 12 months. Independent risk factors of GERD were evaluated in multivariate regression analysis. Considering the effects of GERD in the postoperative period, it was observed that there was a significant improvement and regression in LSG patients compared to the RQS questionnaire (Table 1, 2).

Table 1. Demographic and characteristic features of the patients

	LSG(n:43)	IGB(n:41)	P value
Number of patients	43	41	
Age	41.4(28-52)	43.6(32-61)	0.723
Gender,(Y/F)	32/11	22/19	0.849
BMI, kg/m²	40.7(40-55)	44.2(42-51)	0.903
Hypertension	16	15	0.629
Drugs used			
Inhaler	43	41	0,692
Steroid	11	14	0.754
PPI	21	27	0.472
NSAID	32	34	0.571
Addictions			0.718
Tobacco	11	8	

LSG:lap.sleeve gastrectomy, IGB:Intragastric balloon

Table 2. Scores and postoperative findings of the groups 12 months later the process

	LSG	IGB	P value
Loss of excess weight (LEW%)	35%	24%	<0.05
RQS score posttop	4.5	2.5	<0.05
GGS score postop	4.4	1.7	0.041

RQS: reflux quality of life score, GGS: global general symptom

Statistics

Mann–Whitney U test was used to compare categorical data. All data in the study were analyzed with the SPSS version 25.0 data package. Data are given as mean ± standard deviation (Sd), percent. The patients in our study group were accepted as randomized because they were similar in terms of BMI, age, gender and number. Statistically significant results were accepted as p<0.05.

Table 3. Regression analysis of independent predictive values of reflux symptoms

Predictive factor	P value	Odds ratio (95%CI)
Age	0.054	2.017 [0.872, 3.671]
BMI	0.067	1.379 [0.911, 3.472]
Gender	0.110	0.928 [0.851, 1.325]

DISCUSSION

Asthma is common worlwide disease and also affects nearly half million people all oveer the world (8). The prevalence of asthma in the world is 1.5, with 16.7% in the adult population and approximately 10% in the pediatric population.

In the literature, there are some studies showing that obesity may cause asthma by triggering hyperresponsiveness of airway, similar genetic familiarity for both diseases in the immune system of human, as well as studies involving medical and behavioral mechanisms such as asthma onset time and drugs used in the treatment. Most of the studies which have evaluated the relationship between asthma and physical activity have mentioned the role of asthma as an independent variable affecting physical activity in young people (9).

In the reviewed researchs, it was reported that there is a positive relationship between asthma and overweight. Relative and absolute criteria have varied in the methodology of studies evaluating the relationship between asthma and weight gain. Significant associations varied according to weight status, definition of pulmonary dysfunction, or gender. In a case-control study reporting a higher probability of being overweight among asthmatics compared to controls (10). In a cross-sectional study which investigates the relationship between asthma and BMI, it was reported that there was a stronger relationship between asthma and BMI (11,12).

Among the methods applied for morbidity, the most effective method stands out today as surgery. Although bariatric surgery is a beacon of hope for these patients, it has been shown by studies that there is a positive improvement in patients and a decrease in the number of attacks. Today, especially LSG is a frequently applied method. There is a decrease in the frequency of reflux in patients after LSG. In most of the morbidly obese patients before bariatric surgery, drugs such as proton pump inhibitors are used frequently and their quality of life indexes. IGB application has been performed for morbidly obese people who are afraid for the complications of surgery, it also leads to effective weight loss (13). The European Community Respiratory Health Survey (ECRHS) found a relationship between asthma and obesity and showed that this relationship carries a higher risk in women than in men (14,15).

In multicentric studies, it has been determined that weight loss achieved non-surgical methods has a positive effect on asthma, and reduces the asthma exacerbations and (16-18). In a large retrospective study, it was shown that in LSG applied procedures, 39.3% patients have stopped to use drugs and 42% of patientsstopped to use bronchodilators (19,20). Bariatric surgery has also been shown to improve lung function and reduce exacerbations in these patients (21,22).

In our study, reflux rates and survey results showed a regression compared to the preoperative period after 12 months postoperatively, and a significant difference was found in LSG process compared to the IGB procedure. In the BAROS quality of life index study which is conducted by Alley et al., reported that obesity primarily impairs quality of life (23-25). In present study, more effective and successful results were obtained in LSB in postoperative follow-ups related to reflux. In the regression analysis results of the patients, preoperative BMI was evaluated as an independent risk factor of age and gender.

In the meta-analysis report of Driscoll et al., reported that the quality of life index improved after bariatric surgery. In the LSG method, which is one of the procedures applied in our study, a significant difference was observed compared to the IGB group in terms of quality index (24). We are in the same opinion that the RQS and GGS scores provide sufficient and effective information in terms of evaluating the obese patient profile, similar with the Driscoll study. Of course, there are some limitations in our study. First of all, they were a retrospective study, the patient group was smaller, and it was not a long-term study.

As a result, we concluded that there was a statistically significant improvement in RQS indices compared to IGB in the postoperative 12-month follow-up of the patients who underwent LSG (Table 3).

CONCLUSION

According to the results of our study, LSG procedure is irreversible compared to IGB in the morbidly obese patient population with asthma, and it is more effective procedure for improving reflux and reducing asthma exacerbations. Although it is not suitable to be applied in every patient due to high morbidity. Prospective and comprehensive studies are needed in the future.

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Conflict of Interest: *The authors declare that they have no competing interest.*

Ethical approval: *Local Ethics Committee has been approved this retrospective research (2021 / 7–decision number 151).*

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