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Research Article

Bariatric Procedures Which Is Safest and Most Effective?

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Abstract

Back ground: *Bariatric procedures significantly enhances the quality of life and causes complete clinical remission or at least in partial improvement of medical comorbidities linked and correlated with obesity, on the other hand, it is correlated with raised perioperative morbidity and mortality rates and consequently considered a surgical challenge.*

Methodology: *a prospective clinical research trial conducted on 100 cases recruited and scheduled for three different bariatric surgical interventions at El Sahel teaching Hospital.*

Results: *The % EWL (percentage of estimated weight loss) and BMI were statically significantly higher in cases of GB (gastric banding and SG (sleeve gastrectomy) in comparison to cases of AGB (adjusted gastric banding). (p values <0.001) The difference regarding % EWL and BMI between cases of GB and SG were not statistically significant.*

Conclusions: *Choice of bariatric surgical intervention should consider suitability for each case scenario with high safety profile revealed in investigated procedures.*

Recommendations: *Future research should consider racial and ethnic differences as variable that could impact surgical outcome.*

Introduction

Obesity is a global widespread epidemic and is considered chronic disease with various coexisting comorbidities that could medically influence the obese individual health status e.g. hypertension, DM, raising the overall health costs of those group of cases. Overweight and obese individuals face a hazardous clinical risk of raised morbidity and mortality, making long term weight management and control a crucial issue among various nations all over the world facing this medical issue particularly developed nations [1,2].

In general treatment of obesity is ineffective with disappointing results particularly in morbid obese cases category requiring surgical weight loss interventions that permits sustained weight loss and reduce comorbid medical risks in clinically significant manner. Obesity is a disease that causes psychological issues besides the risky medical condition of the affected cases. Surgery is an efficient mode of management for morbid obesity, considered in cases having BMI above 40 kg/m^2 and those with BMI >35 kg/m2 with obesity- correlated co-morbidities, the surgical management of obesity using various procedures according to the severity and suitability of the GIT status as some cases could suffer from gastroesophageal reflux making sleeve gastrectomy an unprivileged choice. In obese individuals, the absence of gastro intestinal symptoms Could be clinically misleading [3,4].

The investigational evidence revealed preoperatively showing pathological upper gastro intestinal issues impacts the bariatric surgical interventional options e.g. Gastric banding is contraindicated in clinical scenarios of paraoesophageal hernia, and in gastroesophageal reflux disease -related Barrett's esophagus, gastric bypass is preferred and recommended. The bariatric surgery field is a continuously developing field making the operative interventions much safer as there is continuous improvements and innovations in the operative tools, preoperative assessment, and anesthetic handling of the cases besides the post-operative care and follow up [5,6]. Bariatric procedures significantly enhance the quality of life and causes complete clinical remission or at least in partial improvement of medical comorbidities linked and correlated with obesity. In high-risk obese cases with severe comorbidities, bariatric surgical procedures revealed a positive clinical impact; on the other hand, it is

correlated with raised perioperative morbidity and mortality rates and consequently considered a surgical challenge [7,8].

Aim of the Work

The current research trial mainly aims to comparatively analyses and assess the surgical and clinical risks and benefits of different categories of bariatric surgical interventions focusing on adult cases.

Methodology

The current research trial was prospective in fashion in which 100 cases were recruited and randomized into three research groups each performing a different bariatric surgical procedure in which all recruited study subjects were assessed preoperatively and post operatively as regards clinical data and weight loss parameters e.g. BMI, the research study was conducted at el Sahel teaching hospital. Three operative interventions were evaluated gastric by-pass, gastric sleeve, adjusted gastric banding.

Statistical Analysis

Categorical research data were revealed and displayed as absolute or relative frequencies. Continuous research data were revealed and displayed as median and interquartile range or mean and standard deviation. statistical analysis was conducted via usage of SPSS Version 20.0.

Results

A total of 100 cases were recruited in the current research trial. The included 100 cases were randomized into one of three groups: group I (n=35), including cases who underwent gastric bypass (GB Group); group II (n=33), including cases who underwent adjusted gastric banding (AGB Group); and group III (n=32), including cases who underwent sleeve gastrectomy (SG Group).

	Group I [GB Group] (n=35)	**Group II [AGB Group] (n=33)**	**Group III [SG Group] (n=32)**	***P***
Age (years)	37.14 ± 5.67	36.09 ± 5.59	38.38 ± 5.38	0.258 [1]
Sex Male Female	 15 (42.9%) 20 (57.1%)	 14 (42.4%) 19 (57.6%)	 15 (46.9%) 17 (53.1%)	 0.924 [2]
Preoperative Weight (kg)	112.86 ± 10.57	113.27 ± 10.08	114.19 ± 9.4	0.859 [1]
Preoperative BMI (kg/m^2)	41.49 ± 5.52	41.5 ± 4.99	41.91 ± 5.19	0.935 [1]
Comorbidities Diabetes mellitus Hypertension Cardiovascular disease Sleep apnea	 18 (51.4%) 18 (51.4%) 16 (45.7%) 14 (40%)	 14 (42.4%) 21 (63.6%) 15 (45.5%) 15 (45.5%)	 16 (50%) 19 (59.4%) 16 (50%) 13 (40.6%)	 0.731 [2] 0.584 [2] 0.918 [2] 0.885 [2]
BMI body mass index GB gastric bypass-AGB adjusted gastric banding-SG sleeve gastrectomy Data presented as mean ± SD; or number (percentage) 1 Analysis using one-way ANOVA test 2 Analysis using chi-squared test				

Table 1: Basal Characteristics of Included Cases.

The mean age of recruited cases was 37.19 ± 5.57 years (range: 29-47 years). Of the included 100 study subjects, 44 (44%) were males, whereas 56 (56%) were females. The mean preoperative weight was 113.42 ± 9.96 kg (range: 98-133 kg). The mean preoperative BMI was 41.63 ± 5.19 kg/m2 (range: 31.2-54.9 kg/m2). Of the included 100 cases, 48 study subjects (48%) had diabetes mellitus, 58 cases (58%) had hypertension, 47 cases (47%) had cardiovascular diseases, while 42 study subjects (42%) had sleep apnea syndrome. There were no statistically significant differences between cases of the three research groups as regards basal characteristics (table-1).

	Preoperative	**Postoperative**	**MPD (95% CI)**	***P*** [1]
Weight (kg) Group I (GB Group) Group II (AGB Group) Group III (SG Group)	 112.86 ± 10.57 113.76 ± 9.70 114.18 ± 9.40	 85.37 ± 5.52 94.06 ± 7.98 87.31 ± 9.50	 27.5 (25.9 to 29.1) 19.7 (17.2 to 22.2) 26.9 (25.2 to 28.5)	 <0.001 <0.001 <0.001
BMI (Kg/m^2) Group I (GB Group) Group II (AGB Group) Group III (SG Group)	 41.49 ± 5.52 41.65 ± 4.75 41.91 ± 5.19	 31.37 ± 4.56 34.46 ± 4.02 32.02 ± 4.41	 10.1 (9.4 to 10.2) 7.2 (6.3 to 8.1) 9.9 (9.1 to 10.6)	 <0.001 <0.001 <0.001
BMI body mass index GB gastric bypass – AGB adjusted gastric banding – SG sleeve gastrectomy MPD (95% CI) mean paired difference and its 95% confidence interval Data presented as mean ± SD 1 Analysis using paired student's t-test test				

Table 2: Difference between Preoperative and Postoperative Weight and BMI in Study Groups.

There were statically significant reductions in the mean values of weight and BMI pre and postoperatively in cases of the three research groups (table-2). (p values <0.001)

	Group I [GB Group] (n=35)	Group II [AGB Group] (n=33)	Group III [SG Group] (n=32)	*P*
%EWL	0.61 ± 0.16	0.42 ± 0.15	0.58 ± 0.15	<0.001
	Tukey's Post-HOC Analysis		MD (95% CI)	
	GB vs. AGB		0.19 (0.11 to 0.29)	<0.001
	GB vs. SG		0.03 (-0.06 to 1.2)	0.700
	SG vs. AGB		0.17 (0.07 to 0.26)	<0.001
ΔBMI (kg/m2)	10.12 ± 2.02	7.21 ± 2.63	9.89 ± 2.1	<0.001
	Tukey's Post-HOC Analysis		MD (95% CI)	
	GB vs. AGB		2.9 (1.6 to 4.2)	<0.001
	GB vs. SG		0.23 (-1.1 to 1.6)	0.905
	SG vs. AGB		2.7 (1.3 to 4.01)	<0.001

%EWL excess weight loss percentage
ΔBMI body mass index difference
GB gastric bypass – AGB adjusted gastric banding – SG sleeve gastrectomy
Data presented as mean ± SD
1Analysis using one-way ANOVA test followed by Tukey Post-HOC Analysis

Table 3: Difference between Study Groups regarding %EWL and ΔBMI.

The %EWL and ΔBMI were statically significantly higher in cases of GB (gastric banding and SG (sleeve gastrectomy) in comparison to cases of AGB (adjusted gastric banding). (p values <0.001) The difference regarding %EWL and ΔBMI between cases of GB and SG were not statistically significant, (table-3).

	Group I [GB Group] (n=35)	Group II [AGB Group] (n=33)	Group III [SG Group] (n=32)	*P* [1]
Mortality	0 (0%)	0 (0%)	0 (0%)	NE
Readmission	6 (17.1%)	5 (15.2%)	7 (21.9%)	0.769
Vomiting	2 (5.7%)	3 (9.1%)	4 (12.5%))	0.625
Bleeding	0 (0%)	1 (3%)	1 (3.1%)	0.577
Leakage	2 (5.7%)	0 (0%)	1 (3.1%)	0.385
Reflux	5 (14.3%)	1 (3%)	2 (6.3%)	0.210
Reoperation	2 (5.7%)	1 (3%)	2 (6.3%)	0.814

BMI body mass index
GB gastric bypass-AGB adjusted gastric banding – SG sleeve gastrectomy
NE not estimable
Data presented as number (percentage)
1 Analysis using chi-squared test

Table 4: Difference between Groups regarding Complications

There were no cases of operative mortality in any of the three research groups. The rates of complications (including readmission, vomiting, reflux, bleeding, leakage, and reoperation) were not significantly different among cases of the three groups (table-4). (readmission, vomiting, bleeding, leakage, reflux, reoperation, p values =0.769,0.625,0.577,0.385,0.210,0.814, consecutively).

Discussion

Raised number of cases globally are considered candidates for surgical weight loss procedures particularly morbid obese cases and obese cases with clinical comorbidities in an effort to maintain sustained weight loss and aid in recovery and /or resolution of comorbid conditions various bariatric surgical interventions are tailored according to case scenarios and tailored according to patients requirements for sustained

weight loss for improvement of clinical, metabolic and psychological wellbeing of cases. Bariatric procedures are a safe management protocol for obesity. Postoperative complications although broadly known; on the other hand, there is a deficient research data clarifying intraoperative complications and/or unexpected discoveries intraoperatively and influence on clinical outcomes [9-11].

Various research teams performing bariatric surgery implement various tools in cases assessment preoperatively such as mortality risk score to clarify and categories the high-risk cases. In a prior research study conducted in a retrospective manner like the current research in methodology evaluated bariatric surgery in cases aged above 45 years old, BMI ≥ 50 kg/m^2, hypertension disease, and male gender besides risk factors for pulmonary thromboembolism. In which the gastric by-pass was the preferred surgical intervention in those categories of cases however interestingly another research team revealed that mentioned that DM, restricted surgical experience, and open surgery are considered cornerstone risk factors for early postoperative complications [12,13].

A prior research team conducted a retrospective manner study that revealed that intraoperative findings, e.g. intraabdominal adhesions, abdominal wall hernias, and gastrointestinal stromal tumors are sudden scenarios that could be revealed intraoperatively with intraoperative adverse issues reported in 7.1% of recruited cases, in which visceral injury and anastomosis issues were the most prevalent. An operative plan change was performed in 0.9% and surgical interruption in 1.2% of the cases. Early complications have been revealed in 6.6%. however, in there have been no statistical correlation between intraoperative complications and length of hospital stay or early complications appearance [14,15].

In the current research study, A total of 100 cases were recruited in the current research trial. The recruited 100 study subjects were randomized into one of three research groups: research group I (n=35), including cases who underwent gastric bypass (GB Group); research group II (n=33), including cases who underwent adjusted gastric banding (AGB Group); and research group III (n=32), involving cases who underwent sleeve gastrectomy (SG Group). The mean age of recruited cases was 37.19 ± 5.57 years (range: 29-47 years). Of the included 100 study subjects, 44 (44%) were males, whereas 56 (56%) were females. The mean preoperative weight was 113.42 ± 9.96 kg (range: 98-133 kg). The mean preoperative BMI was 41.63 ± 5.19 kg/m^2 (range: 31.2-54.9 kg/m^2). Of the included 100 cases, 48 study subjects (48%) had diabetes mellitus, 58 cases (58%) had hypertension, 47 cases (47%) had cardiovascular diseases, while 42 study subjects (42%) had sleep apnea syndrome. There were no statistically significant differences between cases of the three research groups as regards basal characteristics.

There were statically significant reductions in the mean values of weight and BMI pre and postoperatively in cases of the three research groups (table-2).(p values <0.001) The %EWL and ΔBMI were statically significantly higher in cases of GB(gastric banding and SG(sleeve gastrectomy) in comparison to cases of AGB(adjusted gastric banding).(p values <0.001) The difference regarding %EWL and ΔBMI between cases of GB and SG were not statistically significant, There were no cases of operative mortality in any of the three research groups. The rates of complications (including readmission, vomiting, reflux, bleeding, leakage, and reoperation) were not significantly different among cases of the three groups. (readmission, vomiting, bleeding, leakage, reflux, reoperation, p values =0.769,0.625,0.577,0.385,0.210,0.814, consecutively).

Even though it was observed that in high risk cases there were higher morbidity rates after bariatric surgical procedures it had an accepted surgical risk profile as observed in the current research study. however other researchers involved we included cases suffering more severe risk factors e.g. liver cirrhosis or advanced heart failure (ejection fraction below 30%), that complexes the perioperative Course of management and raising the morbidity and mortality issues, however those categories of cases were not involved in the current research study [16].

Laparoscopic sleeve gastrectomy is the preferred procedure by many surgeons in morbidly obese cases however it was proven that procedure of choice, laparoscopic roux in Y gastric by-pass is considered the gold standard surgery since it derives a good balance between long-term efficiency and safety furthermore it was displayed that. the calculated rate of early postoperative complications for laparoscopic roux in Y gastric by-pass is higher than that for Laparoscopic sleeve gastrectomy, interestingly as perfomed and shown in the current research study standardized bariatric surgical interventions in well experienced tertiary centers could be conducted in a safe manner even in presence of medical and surgical challenging issues and situations [17].

In prior research systematic reviews and it was revealed and displayed statically significant reduction in weight and low mortality rates were correlated that are in harmony with current research study results as there were no mortalities reported and acceptable complication rates and satisfactory weight loss results as patients were followed up. however different from the current research study previous research teams revealed an interesting fact in which complications rise in a direct proportion with longer operative time and a longer general anesthesia duration raising the issue of anesthetic and surgical skills for future research implementation to evaluate safety and effectiveness of different bariatric surgical interventions [1-5].

Conclusions

The current research study denotes that bariatric procedures have considerable and maintained impact on weight and considerably alleviates obesity- linked comorbidities in bariatric surgery cases.

Recommendations and future research

Future research is recommended to consider racial and ethnic differences with categorization of cases according to level of risk and severity of morbid obesity. Future research efforts should be conducted in a multicentric fashion with larger number of cases to aid in innovation of future clinical guidelines that enhance the level of care in those cases.

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