RESEARCH ARTICLE

DOI: 10.5935/0946-5448.2024.S1.04

International Tinnitus Journal. 2024;S1:24-28

Impact of Bariatric Surgery on Liver Enzymes

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ABSTRACT

Background: Bariatric surgery is superior to conservative procedures in terms of weight loss in obese people. In the long term, it can reduce the incidence of obesity by up to 40% and alleviate a myriad of associated diseases. Since obesity is the leading cause of non-alcoholic fatty liver disease, most importantly, losing weight is one of the first recommendations for individuals with NAFLD.

Aim of the study: Comparison of liver function testing pre-and post-bariatric operation.

Patients and methods: In Baghdad City's private al-dawlia Hospital and private Jenin Hospital divisions of surgery, a prospective research was carried out. From first of Jan 2020 to 30th of December 2022, the 100 patients with severe obesity were recruited in the trial and underwent bariatric surgery (53 patients with SG and 47 patients with bypass), and who accepted to participate in study and selected according to specific criteria.

Results: The mean age was (31.69 $\pm$ 8.466 years) with 64% of females and 36% of males, the mean of pre-surgical BMI was 47kg/m2 but after 2 years the post-surgical BMI was 29kg/m2 with statically significant differences. Also, there was a decrease in all liver function tests when compared before and after surgery, with statically significant association ($p=0.001$). In addition to that we found the AST, ALT and TSB more decrease among SG group than bypass group.

Conclusion: Bariatric surgery is effective for rapid weight loss and maintenance with contribute to prolonged decreased liver function tests.

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Paper submitted on January 03, 2024; and Accepted on January 22, 2024

INTRODUCTION

Over the past many years, excess weight has become much more prevalent. At double rates, especially in the past decade, and Iraq is one of the countries that is witnessing a clear increase in obesity[1].Thus, obesity is the real and influencing factor for the occurrence of some major health problems, such as cardiovascular disease and Type 2 Diabetes (T2DM), in addition to degenerative arthritis and sleep apnea. Therefore, the liver is the most important organ that is directly affected by obesity and fat accumulation Non-Alcoholic Fatty Liver Disease (NAFLD), which accounts for 80% of obese patients[2]. An increase in obesity is considered to be proportional to the increase in deaths as a result of complications from these serious diseases, and liver disease appears to be one of the most important causes of death[3]. Therefore, we must move towards finding an effective, fast and permanent way to get rid of obesity and return the body to its normal state, which is Bariatric surgery, which has proven its ability to eliminate illnesses of obesity, involving NAFLD and insulin resistance. Bariatric surgeries are not of recent origin, but they have occupied a key position among the current therapies for severe obesity. But even long-term studies are not available to quantify these complications of surgical operations[4]. Rapid weight loss one of the things that the patient prefers. But at the same time, it is considered one of the recognized problems, and it can cause Fibrosis. On the reverse side, it may improve steatohepatitis in obese people. Weight loss improves non-alcoholic fatty liver disease and reduces the likelihood that it will progress to Non-Alcoholic Steato Hepatitis (NASH)[5]. After combating obesity, sometimes cirrhosis can be recovered in some instances surgery[6,7]. Unfortunately, cases of acute liver failure or exacerbation of pre-existing liver disease incidence after bariatric surgery[8,9]. Liver disease is usually diagnosed by symptomatic Elevated liver enzymes or imaging results. In addition to a liver biopsy for histopathological evaluation. In follow-up NAFLD individual, the hepatic function test and chemical formulae are frequently used in clinical practice[10]. Evaluation of the impact of bariatric surgery on liver enzymes was the study's primary objective.

PATIENTS & METHODS

In Baghdad City's private al-dawlia Hospital and private Jenin Hospital divisions of surgery, a prospective research was carried out. The research was done during the period from first of Jan 2020 to 30th of December 2022. Target population in this study were patients with morbidly obese patients admitted (surgical unit of the hospital) who underwent SG as definitive treatment for obesity and who accepted to participated in study (both sex) and selected according to specific requirement.

All applicants who meet the following inclusion requirements will be taken into account for enrollment: (Age range: 18 to 65 years) (both type of gender), diagnosed as obese based on the World Health Organization's obesity diagnostic criteria and elevated liver function test preoperatively by AST, TSB and ALT). Persons with a great risk operation, symptoms of nonadherance with preoperative instructions, excessive drug or alcohol misuse, and more were disqualified. Person who has a past of taking or who uses a particular drug chronically in a way that could harm their liver. Unregulated anxiety or other behavioral problems, as well as a family conflicts or a lot of familial strife about the intended operation. Detected with certain conditions that lead to Adipose Hepatica, such as Complete Parenteral Feeding, Autoimmune Hepatitis, Hepatolenticular Deterioration, and Hepatitis C Infection (HCV) genotype 3. We are selected convenience sample, included 100 patients (53 patients with SG and 47 patients with bypass). Thorough data collections along with a targeted physical examination are required to identify the co-morbidities for each participant involved taking measurements of the patient's height, weight, and BMI, as well as other investigation such CBC, electrocardiograms, TSH, T3, T4, sodium, renal function test, cholesterol and assessments of the liver's functioning.

On the morning of the operation, the patients were followed up in the intensive care unit of the hospital and mostly on the second day of surgery, oral solutions are started, and patients are discharged from the hospital after accepting soft foods. And then they are followed up periodically at intervals until two years after the operation, they are called to our outpatient clinic for re-examination. Throughout these checkups, routine biochemical testing and individuals' accurate bodyweight were also recorded. A systematic checklist is created to obtain data from the participants through the direct interview was conducting by the researcher himself that consists of the demographic and comorbidity information with Laboratory test: A computer data model was used to transform the information and perform statistical analysis on it by using the SPS.S (Statistical for Social. Sciences.), the program Version 26 of Microsoft Windows mean and stander deviation for all and frequency to obtain either the quantitative data. We used paired t. test and independent t. test for mean correlation with less than 0.05 was statically differences.

RESULTS

The research sample was comprised of 100 participants overall, with mean age of (31.69 8.466) years and a max. age of (54) years. The study sample had a gender ratio of 1:2, with 64% of females and 36% of men. The results showed that before operation, the mean of BMI for the entire sample was (47.77 ±5.98) and the mean weight and height were (134.15± 22.55 and 167.24 ±9.76, respectively). However, after 2 years following surgery, the mean of BMI decreased to (29.13 ±2.33), with a statistically significant association (p=0.001). Also, there was a decrease in all liver function tests when compared before and after surgery, as the results recorded the mean of AST, ALT, and TSB before the operation were

(82.66±37.30, 95.92±24.98 and 1.20±0.298 respectively) to decrease to a significant level, as it became (40.33±2.22, 39.35±3.37 and 0.98±0.09 respectively) with statically significant association (p=0.001) as shown in Table 1 and Figure 1 & 2. Regarding to types of surgery, 53% of participants underwent to SG and 47% of them underwent to bypass, the result showed no any statically significant association between age and types of surgery. Regarding to gender the result found the female more than male without statically differences among gender and types of surgery. In addition to that we compare the result of BMI post-operation among two groups according to types of surgery, we found the same result of BMI mean among two groups without any statically significant association (p=0.701), but the EBWL% where more among Bypass group than SG without statically significant (p=0.55). Also AST, ALT and TSB more decrease among SG group than bypass group with statically differences in AST and TSB (p=<0.05), while ALT did not record any statically differences between two groups as shown in Table 2.

Table 1. Comprise the patients' LFT values and BMI before operation and two years after operation.

Variables	Pre-surgery (n=100) mean± SD	Post- surgery (n=100) mean± SD	P value
BMI (kg/m2)	47.77±5.98	29.13±2.33	0.001*
AST (U/L)	82.66±37.30	40.33±2.22	0.001*
ALT (U/L)	95.92±24.98	39.35±3.37	0.001*
TSB (U/L)	1.20±0.298	0.98±0.09	0.001*

Paired t test , statically significant *

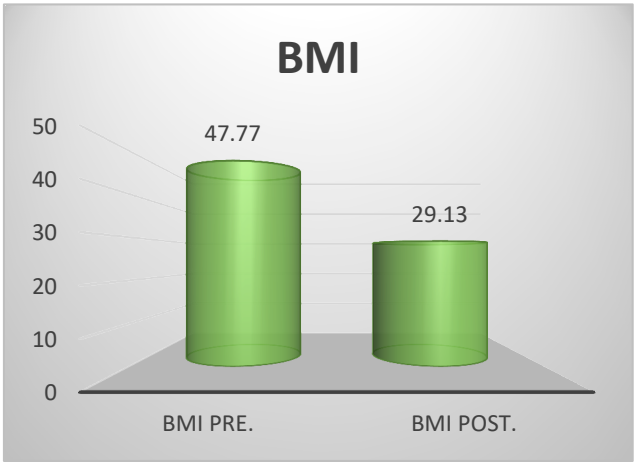

Figure 1: Distribution of study sample according BMI.

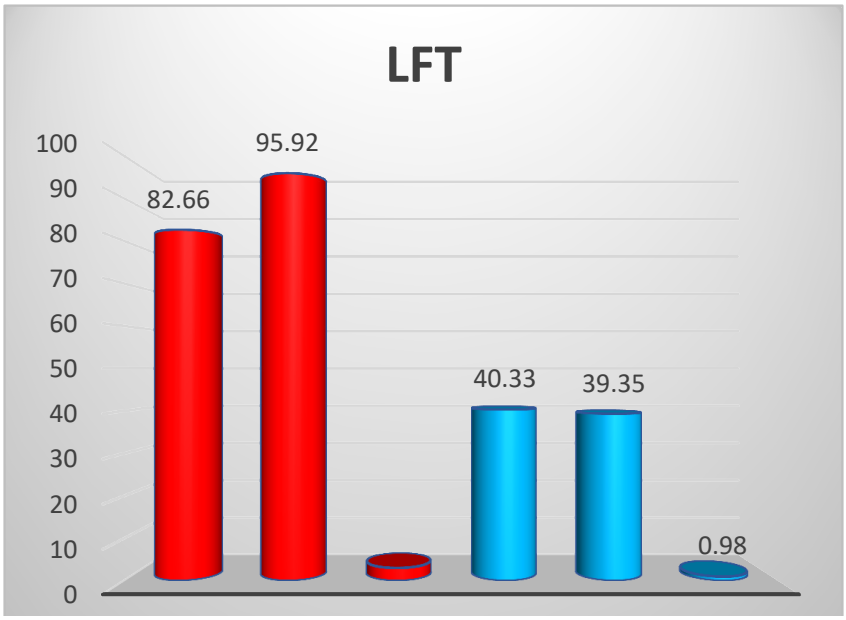

Figure 2: Comparison of pre-and post-operative liver function testing.

Table 2. Distribution of study sample according types of surgery with specific variables.

Variables	SG N=53 Mean ±SD	Bypass N=47 Mean ±SD	P value
Age	32.28±8.99	31.02±7.86	0.460
Female N(%)	33 (62%)	31 (66%)	0.701
Male N(%)	20 (38%)	16 (34%)	
BMI (POST)	29.21±2.42	29.04±2.18	0.711
EBW loss %	73.68%±8.91%	74.68%±7.86%	0.55
AST (POST)	39.77±1.68	40.83±2.517	0.016*
ALT (POST)	39.32±3.96	39.38±2.58	0.092
TSB (POST)	0.95±0.09	1.03±0.07	0.001*

Independent T test , statically significant*

DISCUSSION

Extreme obesity raises the likelihood of NAFLD and even NASH, and the only way to prevent these people from progressing to fibrosis, and cirrhosis is to lose fat before serious liver illness and symptoms appear. Although bariatric surgery is the ideal technique for permanently losing weight, it also has a number of unanticipated side effects that may help treat NAFLD[11]. Therefore, studies have shown that losing weight is the most efficient strategy for reducing abnormal liver enzymes and so restoring liver tissue produced by the fatty liver syndrome. For obese patients, so the much more dependable and efficient way to lose weight is still bariatric surgery[12].

The widespread use of liver enzymes as a primary diagnosis of Manifestations of liver disease in bariatric surgery studies[13]. This is because it is an inexpensive and simple procedure for postoperative follow-up. For patients undergoing surgical intervention, we assessed laboratory results before and after surgical intervention, who were diagnosed according to preoperatively unexplained elevated liver enzymes. In line with earlier research showing the beneficial benefits of bariatric surgery on liver, function tests[14-16], we discovered a statistically significant change among pre- and after-surgical Hepatic function tests (ALT, AST, TSB). Dixon et al. reported that reductions in alanine aminotransferase, and less regularly reductions in aspartate aminotransferase levels, could perhaps effectively forecast histologic restoration in people treated bariatric surgery, directly opposed to some research findings that recommended aminotransferase alone or both aminotransferase and aspartate aminotransferase may be utilized as follow-up indicators of NAFLD[17,18]. Nickel et al. discovered that monitoring patients using a more practical method and computing the AST/ALT ratio dramatically improved after a year[14].

In present study the mean of pre-surgical BMI was 47kg/m2 but after 2 years the post-surgical BMI was 29kg/m2 with statically significant differences. This result agrees with study conducted by Aksoy EK et al. that showed significant differences between pre and post-surgical BMI (44.9 and 27.7 respectively) with significant differences between pre and post liver function test (ALT and AST). He[19] also in study by Jimenez LS et al. found the mean of baseline BMI was 35.7 and decrease after 2 years to become 26.3 with statically significant. In addition to that there were significant differences between pre and post-surgical (AST and ALT)[20].

In our study we compare between type of surgery. To evaluate the effect of SG and bypass when recovering liver function, the result showed more decrease in AST and ALT among SG than bypass. In study conducted by[21] Schmitz SM.et al. revealed that the average hepatic function had greatly improved test (AST and ALT) in patients who underwent SG in comparison to RYGB[21]. Our findings supported those of[22], who discovered that individuals with extremely increased tests for hepatic function who got SG rather than RYGB saw improvement[22]. Additionally, a prospective analysis found that individuals who received SG but not RYGB had better hepatic enzymes level without any statistically significant relationship[23]. A recently published meta-analysis didn't found any statically significant difference in alanine transaminase, aspartate transaminase between RYGB and SG[24]. Upon that best surgical operation, still exists no agreement, though. An Indian longitudinal analysis found that the SG group's cure rate was greater than the RYGB group[25]. But when[9] evaluated the success rates between the RYGB and SG populations at twelve. After surgery, that discovered no discernible variations at the levels of AST and ALT between the two groups[9]. So according to, people who received RYGB had positive performance compare to those who undergone SG[26].

CONCLUSION

Generally, bariatric operation is used to attain and keep weight loss are also thought to be a successful and long-lasting solution for liver disorder.

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