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Research Article

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Exploring the Relationship between Postoperative Obesity and Surgical Procedures in Iraqi Patients and Identifying Risk Factors for Postoperative Obesity in Iraqi Patients

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Abstract: The objective of this study was to evaluate the potential complications that may arise following the surgical procedure, which was designed to increase the patient's body weight. Furthermore, the study identified risk factors by evaluating the logistic regression coefficient. Where The study involved 140 patients from Iraq's hospitals with obesity complications after surgery, categorized by age and gender. Written consent was obtained from all participants, and the research was conducted over a year from April 6th, 2023, to April 2nd, 2024. Obesity increases surgery duration and postoperative pain, affecting patients differently due to complex conditions. High sensitivity to pain management and early decision-making are crucial to prevent complications and readmissions. Patients at risk should receive a general condition overview before surgery. As obesity rates increase, it's essential to establish safe, non-surgical surgical techniques and establish protocols for postoperative pain relief. Postoperative surveillance guidelines can detect complications early and prevent hospital readmission. Patient characteristics, surgical methods, risks, and side effects were all included of the research. It uncovered variables like complexity, quality assurance, elective vs. emergency, open vs. laparoscopic, and confounding that impact surgical outcomes. Additionally, the study emphasized the significance of surgical divisions' need for specialized training and skill development. While obesity itself was not determined to be a risk factor, the presence of third-party accreditation and the appropriate infrastructure at centres of excellence where bariatric surgery is conducted frequently result in better outcomes. The overall infection rate was higher in the obese group, with a statistically significant relationship between BMI and comorbidities with postoperative outcomes. No significant differences were identified in other complications, length of hospital stay, or deaths. Additionally, this study found that patients who undergo colorectal surgery gradually become more obese as the procedures performed in obese patients are longer and higher rates of infectious complications are identified. The most influential risk factors in this study were BMI, medications prescribed post-surgery, fluid retention, and changes in dietary habits.

Keywords: Postoperative, Obesity, Surgical, Participants, Factors, BMI.

INTRODUCTION

Several factors can affect the likelihood of postoperative obesity following surgical operations. Complication rates are higher in obese patients undergoing difficult oncologic operations, and obesity is a risk factor in and of itself for surgical complications [Wiser, I. *et al*., 2019]. Obesity following surgery is a real possibility in patients with modifiable risk factors such as diabetes, hyperlipidemia, and obstructive sleep apnea [Nepogodiev, D. *et al*., 2015]. It is important to adhere to the postoperative diet and have access to support services in order to prevent weight regain after surgery, which can be caused by postoperative nutritional obstacles and insufficient dietary services [WHO. *et al*., 2018]. In addition, inflammation caused by surgery can make insulin resistance worse in obese individuals who do not have diabetes, which can lead to postoperative obesity and other complications [Cooper, J. D. *et al*., 2019]. In order to improve surgical results and manage obesity after surgery, it is essential to understand and treat these issues.

Many people suffer from excessive weight gain after undergoing some surgeries, and this often happens after the follow-up period, especially after pregnancy. One of the most important problems that lead to weight gain after surgery is One of the most significant factors contributing to weight gain after surgical operations is fluid retention following surgery and exposure to shock. Shock exposes the body's tissues, causing inflammation that, in turn, leads to fluid retention from certain accidents. Stress triggers numerous hormonal imbalances in the body, which in turn cause the kidneys to retain water, leading to weight gain and obesity[Shannawaz, M. A. P. *et al*., 2018].

It is often the case that cosmetic procedures yield satisfactory results, although this is often at the expense of a minimal risk of complications. [Sood,

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A. *et al*., 2015] While major complications are rare, they can cause long-term morbidity and a significant economic impact that is often not covered by the patient's insurance. For this reason, it is important to identify risk factors that may sabotage the results of any cosmetic procedure, as obesity and overweight have been shown to be an independent risk factor for postoperative complications regardless of the surgical setting[Dindo, D. *et al*., 2003].

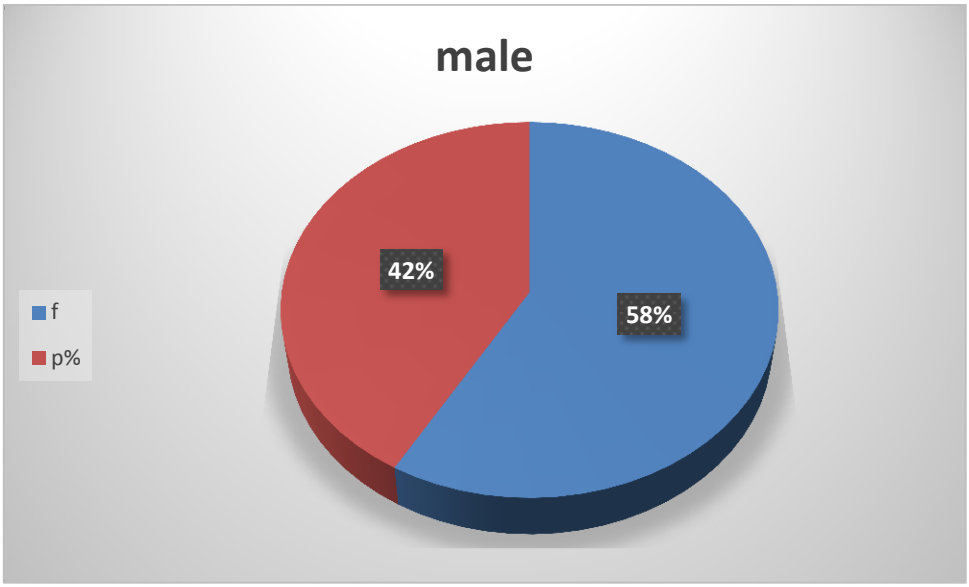
Obstructive sleep apnoea (OSA) is a prevalent comorbidity in obese patients, with weight loss demonstrating a notable reduction in symptoms. OSA is significantly influenced by anaesthesia, which can result in postoperative complications such as pneumonia and cardiac events. It has been demonstrated that preoperative screening and treatment can improve postoperative outcomes. The chronic pain experienced by patients with obstructive sleep apnoea (OSA) results in increased analgesic use, which in turn exacerbates respiratory impairment. The anesthesiologic management of patients with obstructive sleep apnea (OSA) is complex. However, optimizing OSA impairment in the preoperative phase can reduce complications. [Mullen, J. T. *et al*., 2008]

The prevalence of non-alcoholic fatty liver disease (NAFLD) is on the rise, largely due to its association with obesity and higher in-hospital mortality rates. Bariatric surgery is a safe option for the majority of patients with NAFLD, with low morbidity and complication rates. The administration of a high-protein formula diet prior to the procedure has been demonstrated to improve metabolic status and the feasibility of the procedure. Liver cirrhosis has a significant impact on the incidence of postoperative complications, with an overall mortality rate of 28%, as reported in a German study. [Nafiu, O. O. *et al*., 2011; Poirier, P. *et al*., 2006; World Health Organization, 2021; Hawn, M. T. *et al*., 2005]

MATERIAL AND METHOD

Collection Data

Data and demographic information for patients were collected from several different hospitals in Iraq. The study targeted 140 patients suffering from obesity complications after surgery. The patients were distributed according to age, from 20 to 60 years. The data was also distributed according to gender: 80 male patients and 60 female patients. The figure below illustrates the distribution of patients according to age and gender.



Study Period

Prior to the commencement of this study, written consent was obtained from all participants in accordance with the legal requirements and declarations for scientific research. The data was collected, and the research was written over a period of one year, ranging from 6th April 2023 to 2nd April 2024.

Study Design

This study was designed according to a cross-sectional study based on a statistical basis for data analysis. The demographic characteristics of the patients were studied, which consisted of height, age, body mass index, surgical operations that were performed in hospitals, complications that the patients suffered from after the surgical operation, and symptoms according to for each surgical

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operation, a mathematical equation was used to calculate the body mass index for each patient. In addition, specific types of anesthesia were employed for the purpose of the surgical procedure, including general anesthesia and local and spinal anesthesia.

In this study, the confounding factors that affect the surgical procedure and its results were identified, including elective versus emergency surgery, open versus laparoscopic surgery, the complexity of the surgical procedure, and quality assurance in surgery. The latter has been shown to improve patient safety and quality in various procedures. Specialization of surgical divisions and personal skill training have also been demonstrated to improve outcomes. Nevertheless, obesity has not been demonstrated to be an independent risk factor. Bariatric surgery, which is often performed in centres of excellence, frequently results in improved outcomes due to third-party certification and the availability of necessary infrastructure and protocols.

Aim of Study

This study was omitted for the purpose of evaluating the complications that may arise following the surgical operation, which was designed to increase the patient's body weight. Additionally, the study identified risk factors by evaluating the logistic regression coefficient.

Statistical Analysis

The data was subjected to statistical analysis using the IBM SPSS statistical analysis program. Additionally, the tables and figures related to patient results were generated using the Microsoft Excel 2013 program, with the real value, arithmetic mean, frequency, and percentage set to one of these determinants. The study and the elements that controlled patient outcomes were also analysed using a logistic approach, with the objective of studying the risk factors for this study.

RESULTS

Table 1: General characteristics of patients

Variable	p	f
Age		
20-29	7.14	10
30-39	21.43	30
40-49	35.71	50
50-60	35.71	50
BMI		
28-31	71.43	100
32-35 kg/m2	28.57	40
Sex		
Male	57.14	80
Female	42.86	60
QOL		
30-39	21.43	30
40-49	28.57	40
50-59	28.57	40
60-69	21.43	30
Education		
Primary	7.14	10
Secondary	57.14	80
College	14.29	20
High	21.43	30
Outcomes		
300-600	28.57	40
700-1000	57.14	80
>1000	14.29	20
Type of Anesthesia		
general anesthesia	57.14	80
local	21.43	30

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spinal anesthesia	21.43	30
Previous surgical procedure		
yes	71.43	100
no	28.57	40
Smoking		
yes	25.00	35
No	75.00	105
Taking Blood Pressure Medication		
yes		
No		

Table 2: Distribution of patients according to the type of surgical operation performed for 140 patients

v	f	p%
Pregnancy	15	10,71
Colorectal Surgery	40	28,57
Laparoscopic cholecystectomy	30	21,43
gastric sleeve surgery	20	14,29
hysterectomy	35	25,00

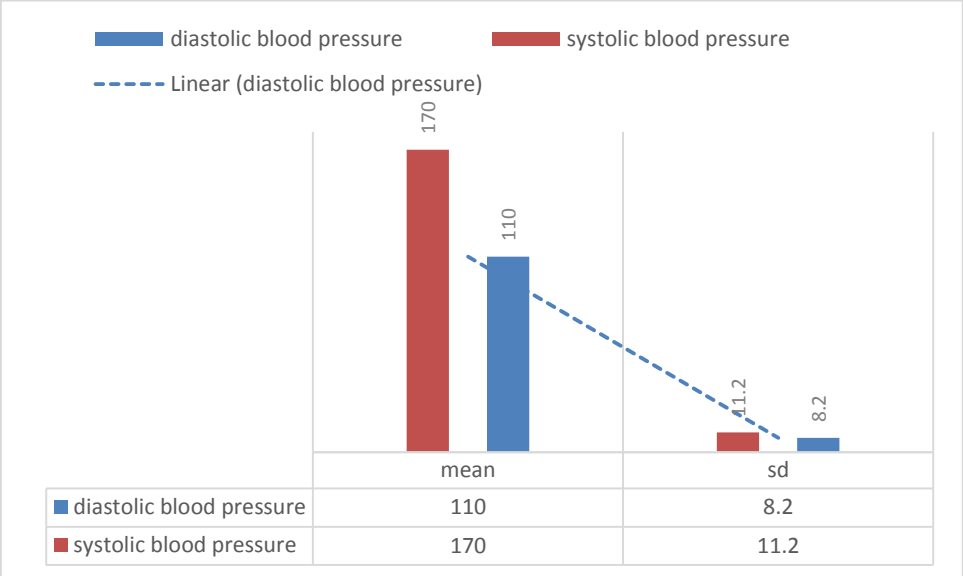

Fig 1: Evaluation of blood pressure results before surgery

Table 3: Evaluating patient outcomes according to biochemical parameters

Variable	Mean	Sd
AST	35.3	12.2
ALT	31.3	13.6
ALP	250.4	87.8
LDH (U/L)	488	299.4
HBA1c (%)	6.5	1.6
LDH (U/L)	459	288
FBS (mg/dl)	10.2	3.9

Table 4: Evaluating the quality of life of patients after surgical operations according to type of surgery

v	Mean	SD
Pregnancy	49.2	11.1
Colorectal Surgery	44.5	5.67
Laparoscopic cholecystectomy	37.4	5.9
gastric sleeve surgery	47.3	7.86
hysterectomy	52.6	3.35

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Table 5: Assessing of complications in general and surgical outcomes for Iraqi patients

Variable	Details
Bleeding f (p%)	6 (4.2)
Surgical site infection f (p%)	4 (2.8)
Anastomotic leaks f (p%)	3 (2.1)
Respiratory weakness f (p%)	4 (2.8)
Acute kidney failure f (p%)	5 (3.5)
Intensive care unit f (p%)	7 (5)

Table 6: Result in patients according to LOS relation with BMI

Los	28-31	32-35
Mean ±SD	6.2±3.6	8.1±2.9
Median (range)	7 (2-12)	9 (4-14)

Table 7: Logistic regression affecting on study patients

v	CS	OI	P-value
AGE	1.3	1.12-1.4	0.76
SEX			
FEMALE	1.58	1.42-1.8	0.85
Male	1.3	0.9-1.6	0.55
BMI			
28-31	2.5	1.6-3.5	<0.001
32-35	2.938	1.7-3.98	<0.001
Medications prescribed post-surgery	2.1	1.4-2.8	0.67
Fluid retention	2.78	2.6-2.9	<0.001
Changes in dietary habits	3.1	2.6-3.9	<0.001
Observed complication rates	2.78	2.1-3.2	0.0021
Reduced physical activity during the recovery period	1.88	1.34-2.43	0.053
Pregnancy	2.78	2.2-3.65	<0.001

DISCUSSION

A cross-sectional study was conducted on 140 patients. The study aimed to identify the causes of weight gain after surgery and to determine the risk factors affecting patients. This was achieved through the use of a statistical analysis program, IBM spss soft 22, to conduct a logistical analysis.

The data was distributed according to age, with 7.14% of patients falling within the 20-29 age bracket, 21.43% within the 30-39 age bracket, 35.71% within the 40-49 age bracket, and 50-60 years. A total of 35.71% of patients were in the 50-year age group. Patients were also distributed according to body mass index into two groups: 28-31 kg/m2 (71.43% of patients, 100 in total) and 32-35 kg/m2 (28.57% of patients, 40 in total).

The occurrence of obesity following an operation is attributed to a number of factors, including pre-existing obesity, the presence of risk factors such as diabetes, hyperlipidaemia, and sleep apnoea, a lack of adequate services, insulin resistance, and dietary obstacles. This combination of factors renders sugary procedures more dangerous, whereas poor services and nutrition contribute to the development of overeating disorders. [Owens, W. D. *et al*., 1978; Clavien, P. A. *et al*., 2009; Clavien, P. A. *et al*., 2017] Consequently, it is crucial to manage excess fat through surgical means in order to achieve optimal results.

The majority of research indicates that obesity is a significant risk factor for postoperative surgical site infections. Nevertheless, the utilisation of minimally invasive techniques can effectively reduce the occurrence, particularly in colorectal surgeries. It is of paramount importance to prioritise the improvement of comorbidities prior to surgery in order to achieve more favourable outcomes. Metabolic and bariatric surgery has been demonstrated to be an effective treatment for super-obese patients. The implementation of standardised therapeutic routes, laparoscopic techniques, and certified centres of excellence has significantly enhanced the safety of surgical procedures and resulted in relatively low complication rates. [Giles, K. A. *et al*., 2010; Liu, T. *et al*., 2013]

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It is well documented that obese patients frequently experience higher complication rates in open and complex oncologic procedures, including visceral surgery. Nevertheless, these adverse effects do not impact overall survival. Studies on laparoscopic surgery indicate that the negative effects are less pronounced, although there is a paucity of research on obese patients who are not bariatric surgery candidates. As the prevalence of obesity continues to rise globally, further investigation is required to elucidate the impact of obesity on surgical complications.

Obesity is not a reliable risk assessment parameter in isolation. To gain a full understanding of the relationship between obesity and surgical complications, it is necessary to conduct nationwide register-based studies. These studies must consider the various aspects of obesity and related comorbidities that contribute to the risk of surgical complications.

The presence of excess adipose tissue can lead to serious negative health consequences, such as cardiovascular disease (mainly heart disease and stroke), type 2 diabetes, and musculoskeletal diseases, such as osteoporosis. These pathological conditions are causes of premature death. Furthermore, obesity can lead to serious negative effects on patients, as it can result in the development of certain types of cancer (endometrial cancer, gland and colon cancer).

The study involved the assessment of fasting blood sugar (FBS) hydroxyproline-containing collagen proteins in diabetic patients and those who do not have diabetes. The results indicated that 55% of patients with slightly above-average FBS levels exhibited a 55.0-48.3% increase in the average.

Table 5 presents an analysis of complications and surgical outcomes for Iraqi patients. The prevalence of patients was 29, distributed as follows (anastomotic leaks f (p%) 3 (2.1), respiratory weakness f (p%) 4 (2.8), acute kidney failure f (p%) 5 (3.5), intensive care unit f (p%) 7 (5).

A logistic regression analysis was conducted to determine the effect of age on mortality factors in patients undergoing caesarean section (CS) with or without osteogenesis imperfecta (OI). The results indicated that age was a significant factor in CS with OI (P-value = 0.76), with an odds ratio (OR) of 1.3. In contrast, age was not a significant factor in CS without OI (P-value = 0.85), with an OR of 1.58.

A similar analysis was conducted to determine the effect of gender on mortality factors in patients undergoing CS with or without OI. The results indicated that gender was a significant factor in CS with OI (P-value = 0.55), with an OR of 1.3. In contrast, gender was not a significant factor in CS without OI (P-value = 0.85), with an OR of 1.42.

BMI: 28-31kg/m2,2.5 oi: 1.6-3.5, P-value <0.001 and 32-35kg/m2, cs: 2.938 oi: 1.7-3. .98, P-value <0.001, medications prescribed post-surgery 2.1, 1.4-2.8, 0.67, fluid retention 2.78, 2.6-2.9, <0.001, changes in dietary habits 3.1, 2.6-3.9, <0.001, observed complication rates: 2.78 (95% ci: 2.1-3.2), p = 0.0021. reduced physical activity during the recovery period: 1.88 (95% ci: 1.34-2.43), p = 0.053. Pregnancy: 2.78 (95% ci: 2.2-3.65), p < 0.001.

CONCLUSION

Patients with obesity experience postoperative pain and longer surgical times as a result of their unique medical histories. To avoid problems and readmissions, it is essential to make decisions quickly and have a high sensitivity to pain management. A general description of the patient's condition should be provided to those at risk prior to surgery. There has to be a system in place to alleviate postoperative discomfort and provide safe, non-invasive surgical procedures because the obesity prevalence is rising. Early detection of problems and prevention of hospital readmission are possible outcomes of following postoperative surveillance guidelines.

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