Relevance of the Obesity Surgery Mortality Risk Score in Patients Undergoing Roux-en-Y Gastric Bypass.

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Citation

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Abstract

BackgroundThe Obesity Surgery Mortality Risk Score (OS-MRS) has been proposed as a user-friendly tool for the assessment and risk stratification of patients undergoing bariatric surgery. MethodsProspectively collected data from 116 patients undergoing Laparoscopic Roux-en-Y Gastric Bypass (RYGBP) at a single university hospital over a period of 18 months from 2008 to 2009 were analyzed to determine the preoperative factors correlating with 90-day mortality. ResultsThe variables used include body mass index ≥50 kg/m2, male gender, hypertension, patient age ≥45 years and pulmonary embolus risk, which included previous thrombosis, pulmonary embolus, inferior vena cava filter and right heart failure. Using the 3 risk classes (A, B and C), 97 % of the patients were among the low and intermediate risk groups (A and B). There were zero mortality rates in our study group. ConclusionThe analysis confirms that mortality risk for gastric bypass can be stratified based upon independent variables that can be identified before surgery. The OS-MRS is a clinically relevant scoring system and may contribute to surgical decision making in bariatric surgery.

INTRODUCTION

At present, surgery represents the only long-term weight loss solution for morbidly obese patients [1]. Currently the incidence of perioperative mortality varies between 0% and 1.5% in series of open Roux-en-Y gastric bypass (RYGBP) [2], [3], [4] and laparoscopic RYGBP [5], [6], [7], [8]. Some studies have suggested an even greater mortality risk in certain patients during the first year after surgery, such as patients of old age [9].

Obesity surgery mortality risk score (OS-MRS) is a score suggested to predict risk of mortality from bariatric surgery [10]. The score was developed from a single institute's experience in the United States with 2075 cases of both open and laparoscopic primary RYGBP cases during a 10-year period and determined the preoperative factors correlating with 90-day mortality.

The impact of surgical complications on mortality has been mentioned before [11], [12] and assessments of the predictability of complications after surgery have been made [13], [14], [15].

We analyzed the data from a prospectively collected database of 116 patients who had Laparoscopic Roux-en-Y Gastric Bypass (LRYGBP) surgery during an 18 months period to define the preoperative predictors of increased postoperative mortality using the Obesity Surgery Mortality Risk Scoring system. Patients who had revision surgery were not included in the study group. The ultimate results validate the scoring system and consider it to be a valuable tool for quality assessment in bariatric surgery.

METHODS

One hundred sixteen patients who had LRYGBP at St George's Hospital in London between 2008 and 2009 were selected. Patients were considered eligible for surgery for obesity according to the National Institute for Health and Clinical Excellence guidelines and the 1991 National Institutes of Health Consensus Conference guidelines [16] if their body mass index (BMI) was ≥35 kg/m2 associated with obesity-related co-morbidities or ≥40 kg/m2 with or without any co-morbidity.

Procedure-related mortality, including all deaths within 90 days of laparoscopic RYGBP and all deaths related to a complication of the surgery were excluded. Also, only primary laparoscopic RYGBP cases were analyzed. All revisions were excluded because of the known greater risk [11], [17]. The preoperative factors analyzed included age; gender; BMI; the presence of hypertension and pulmonary embolus risk which includes venous stasis ulcers, previous

pulmonary embolus, previous deep vein thrombosis and previous placement of an inferior vena cava filter.

Hypertension required a sitting blood pressure at initial visit of ≥150 mm Hg systolic and/or ≥90 mm Hg diastolic or the use of antihypertensive medications. Venous stasis ulcers required the presence or history of pretibial venous stasis ulcers.

The OS-MRS was applied for each patient in the study by assigning the point value of 1 to the presence (and 0 to the absence) of each of the independent variables. The point scores were then grouped into 3 categories of risk [low, class A (score 0-1); intermediate, class B (score 2-3); and high, class C (score 4-5)].

RESULTS

A total of 116 patients with a mean age of 43.15 +/- 9.47 and mean BMI of 49.45+/- 7.76 underwent laparoscopic RYGBP [Table1].

Tables 2 and 3 list the number of the patients according to the scored co-morbidities using the OS-MRS. The analysis appeared to demonstrate that the majority of the patients are in each of the low and intermediate score subgroups (28 patients with 0 points, 41 patients with 1 point, 25 patients with 2 points, and 18 patients with 3 points). However, the patients decreased dramatically in the highest scoring groups, as only 4 patients (3.4% of the total) had 4 points and none of the patients had the maximum point score of 5 points.

Figure 1

Table 1 Preoperative demographics.

Parameters	Values
Female/male, n	93/23
Mean age+/-SD	43.15+/-9.47
Mean BMI+/-SD	49.45+/-7.76

Although there were zero mortality rates in the study group, the patients with a total of 4 or 5 points were 3.4% and 0%, respectively.

Figure 2

Table 2 Numbers of co-morbidities.

Co-morbidity (n)	Patients (n)	Rate (%)	Death(n)
0	28	24.1	0
1	41	35.3	0
2	25	21.6	0
3	18	15.6	0
4	4	3.4	0
5	0	0	0

Figure 3

Table 3 Combined numbers of co-morbidities.

Class	Patients (n)	Rate (%)
A	69	59.5
B	43	37.1
C	4	3.4

DISCUSSION

Multiple publications have identified the mortality risk for a patient undergoing LRYGBP surgery to be in the range of 0–1.5% [2], [3], [4], [5], [6], [7], [8]. A large meta-analysis of >29,000 patients placed the mortality rate of GBP at 0.5% [18]. Although such a mortality rate is very low, these reports were not intended to provide identification of high-risk patient characteristics. DeMaria et al. [10] showed the overall mortality rate was 1.5%, within an acceptable range according to published data [2], [3], [4], [5], [6], [7], [8].

However, in our study group no mortality occurred, bearing in mind that the majority of the patients (97%) were among the low-intermediate risk groups. Thus, zero mortality rates represent an outstanding result among all patient subgroups and, as one might expect, correlated strongly with patient selection and the morbid status of the patients undergoing bariatric surgery in the United Kingdom.

The OS-MRS can be a valuable tool to compare the mortality among different units according to the risk stratification. This would allow bariatric units performing high-risk cases to justify a mortality that might appear high but is within accepted standards after risk stratification. The preoperative risk reduction strategies for a particular patient have been limited in reducing the preoperative BMI, which might seem a weakness of the OS-MRS. However, we believe the value of the system is in making health centres and professionals aware of the advantages to morbidly obese patients, who should undergo surgery when they are younger and less obese and before they have accumulated the co-morbidities of morbid obesity, at a stage when the predicted mortality is low.

Male gender and advanced age should be considered

established risk factors for bariatric surgery complications and mortality because of the findings from numerous studies [12], [19], [20], [21]. Super-obesity has also been correlated with increased risk [11], [12].

The importance of pulmonary embolism as a complication leading to increased mortality has been demonstrated repeatedly in surgical reports [11], [14]. Sugerman et al. [22], in a series of 1976 patients, found an 8% mortality rate in patients with venous stasis ulcers who underwent RYGBP. Those without venous stasis ulcer had a mortality rate of 0.2%.

Hypertension was identified as a co-morbidity increasing perioperative mortality in the OS-MRS and has been previously shown to correlate with increased mortality risk in a similar study.[12]. The mechanism by which hypertension contributes to increase mortality risk remains unclear.

Hypertension is a known a marker for cardiovascular disease. It is also associated with the metabolic syndrome related to obesity and the android body habitus. Thus, technical factors at surgery could contribute to more postoperative complications, with a resulting impact on mortality. Alternatively, recent research has suggested that systemic hypertension might represent a chronic inflammatory condition, at least in some patients [23]. A chronic inflammatory state can also arise from severe obesity [24]. Chronic inflammatory conditions and an exaggerated immunologic response to injury increase the likelihood of the systemic inflammatory response syndrome and organ failure after tissue injury and presumably surgery or its complications.

However, the published evidence indicating age as a factor that increases mortality is strong. Livingston et al. [12], in a series of 1067 consecutive patients undergoing GBP, found that patients = or >55 years had 3-fold greater mortality than younger patients. Sosa et al. [25] found in a series of 550 laparoscopic GBP patients that 23 were ≥60 years and had a mortality rate of 4.3% compared with 0% in the patients ≤60 years. Flum et al. [9] have identified high mortality after bariatric surgery in Medicare beneficiaries of advanced age.

The main aim of our study was to assess and validate the OS-MRS as a system that would allow clinicians to provide an improved informed consent process to their patients and improve surgical decision making.

Finally, hospitals with low mortality rates might demonstrate that patient categories being in the low-intermediate risk group are responsible for the low mortality rates.

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