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SERVER OBESITY SCORE (S.O.S.): ELABORATION OF A PROTOCOL TO DEFINE SEVERITY CRITERIA AND PRIORITIZATION OF PATIENTS FOR BARIATRIC SURGERY

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INTRODUCTION

Obesity has been identified as one of the main risk factors for cardiovascular diseases, diabetes mellitus and chronic kidney disease, among others. In Brazil, studies indicate that approximately 50% of the adult population is overweight and obese. The World Health Organization (WHO) estimates that in 2025 there will be 2.3 billion overweight adults in the world and of these 700 million with obesity (BMI above 30). Since the 1980s, the rate of overweight individuals has increased by 27.5% in adults and 47.1% in children and adolescents. [1,2]

Bariatric surgery has been increasingly sought after and indicated as an effective alternative in the treatment of obesity and its complications. The Federal Council of Medicine (CFM) establishes that the indication for bariatric surgery requires the fulfillment of three criteria: 1) age over 18 years; 2) failure of the clinical treatment for 2 years confirmed by an endocrinologist; and 3) Body Mass Index (BMI) equal to or greater than 40 kg/m² or greater than 35 kg/m² in patients with comorbidities associated with obesity. [3]

In the public health system in Brazil between 2008 and 2018, a total of 73,976 bariatric surgeries were performed, approximately 95% of them using the gastric bypass technique. Over the years, the increase in the number of surgeries has been progressive, with 3,195 being performed in 2008 and 10,852 in 2018, a growth of 339%. It is estimated that the population eligible for bariatric surgery by SUS is approximately 708 thousand people and in some cities and states the queue can take around 5 years. For example, the case of the Hospital das Clínicas in Campinas, with 1,500 patients waiting.[3,4] In our service, between January 2018 and September 2019, only 53 bariatric surgeries were performed, and currently our waiting list has approximately 370 patients, that is, the queue revolves around 07 years.

Brazil is considered the second country in the world in number of bariatric surgeries performed. Adding the public and private health system from 2011 to 2018, we have a total of 424,682 patients operated on, a percentage increase of 84.73%. According to the Brazilian Society of Bariatric and Metabolic Surgery (SBCBM) in 2017 in the private sector 105,642 bariatric surgeries were performed while 10,089 in the public system, representing only 9.5% of the total, that is, a large discrepancy of access for users dependent on the public system. [4]

In many public hospitals, the only prioritization criterion for bariatric surgery is the waiting time in the queue, unlike private services. This time in the queue can lead to bad consequences for patients, such as worsening of pre-existing diseases and increased mortality.

An unpublished Brazilian study published in 2019 in the journal Preventing Chronic Disease of the CDC (Centers for Disease Control and Prevention) showed that approximately 25.3% of deaths from chronic noncommunicable diseases (NCDs) and 14.9% of the total number of deaths in the Brazil could be avoided each year by reducing the BMI of the population. It is estimated that a reduction of 1.0kg/m2 in the population's BMI reduces 4.6% of deaths from CNCDs. Furthermore, 10% of deaths from CNCDs could be avoided if BMI rates were reduced to the levels observed in 2002 and 2003. There is evidence that type 2 diabetes mellitus (DM), chronic kidney disease (CKD) and metabolic syndrome are diseases that, associated with obesity, considerably increase morbidity and mortality, mainly due to increased cardiovascular risk. In addition, there are several comorbidities highly related to overweight and obesity, such as obstructive

sleep apnea syndrome, gastroesophageal reflux disease and neoplasms in general. 5

Currently, the bariatric surgery service at Hospital do Servidor Público Municipal has a list of 370 patients on the waiting list. These patients enter the queue after referral from the endocrinologist proving failure of clinical treatment for at least 2 years. Patients are selected in chronological order of entry in the queue for preparation and divided into groups of about 25 who will be closer to performing the surgery. These will undergo consultations and lectures with the service's multidisciplinary team, involving medical staff, nutrition, psychology, speech therapy and dentistry, among others, requiring the evaluation and release of the patient by all these professionals to undergo surgery.

Due to waiting in our queue, there is currently a growing demand for requests for prioritization of some patients by endocrinologists and nephrologists, mainly due to difficult-to-control diabetes and progression of kidney disease. Thus, it is necessary to establish a prioritization system for choosing patients for bariatric surgery in public services, with the main objective of reducing morbidity and mortality.

Justifying this research, in our service the time on the waiting list for bariatric surgery is around 05 to 07 years, for all patients, not taking into account the comorbidities and risks of these individuals, currently. In addition, to date, there is no Brazilian protocol described in the literature on the subject.

GOAL

The aim of this study is to develop a protocol to define severity criteria and prioritization of patients for bariatric surgery.

METHODOLOGY

To develop a prioritization protocol through a literature review for patients on the queue for bariatric surgery at the ''Hospital do Servidor Público Municipal", relating obesity to the degree of organ dysfunction of the patients on the waiting list.

The protocol will be proposed through a score taking into account the following aspects:

- Chronic kidney disease
- Insulin-dependent diabetes mellitus
- Cardiovascular risk assessment
- Risk for developing neoplasia
- Gastroesophageal reflux disease
- Non-alcoholic fatty liver disease
- Body mass index (BMI)
- Age
- I wait in other queues due to obesity
- Impact of obesity on quality of life

According to the score, the patient will be prioritized or not for surgery in a color scale: green, yellow and red. Red is the patient at high risk of progression of obesity-related diseases requiring surgery and immediate preparation. The yellow one is the patient who must be monitored for disease progression and the green one can follow in the queue in chronological order. This way, it is intended to minimize the risk of the patient remaining in the queue for a long time and the evolution of diseases. The proposed name for this indicator is SOS (Server Obesity Score).

RESULTS AND DISCUSSION

In 2017, a study was carried out evaluating the comorbidities of a sample of patients in the queue at our service and the results were: systemic arterial hypertension present in 70% of the patients, being the most prevalent disease, followed by hepatic steatosis in 56% and diabetes mellitus by 51%. Other comorbidities present in the patients analyzed in our queue were: Arthropathy in 26%, dyslipidemia in 22%, mood disorders in 19%, gastroesophageal reflux disease (GERD) in 10%, and sleep apnea syndrome

in 1.5%. In addition, regarding the number of medications used by the sample, an average of 2.9 ± 2.3 medications per patient was observed, with a median of 3, minimum of 0 and maximum of 10 medications to control comorbidities. As for the body mass index, it was demonstrated that all patients in the study had grade III obesity (severe or morbid) with a BMI above 40, suggesting that patients in the public service are referred for surgery with a higher BMI, possibly presenting more serious diseases. advanced and higher number of comorbidities. In addition, there was a considerable prevalence of patients classified as super obese (BMI above 50) with approximately 20.5% of the sample. It was concluded with the work that these patients evolved with worsening of comorbidities during the waiting time in the queue. [6]

CHRONIC KIDNEY DISEASE (CKD) AND DIABETES MELLITUS (TYPE 2 DM)

Obesity is an important independent risk factor for the development of chronic kidney disease, and this is a major factor for early mortality in patients with DM II. There is a strong association between BMI and the incidence of advanced CKD, and small elevations in albuminuria are already associated with an increased risk of acute myocardial infarction. [7,8]

Chronic kidney disease is also an independent risk factor for angina, acute myocardial infarction, stroke, and peripheral vascular disease. In Brazil, it is estimated that more than 100,000 patients are on dialysis and the prevalence of CKD is not known. Obesity influences the development of CKD by predisposing to diabetic nephropathy, hypertensive nephrosclerosis and focal segmental glomerulosclerosis (FSGS). In addition, high levels of serum creatinine are associated with an increased risk of metabolic syndrome (MS). Individuals with MS are two to three times more likely to develop microalbuminuria. [9]

The pathophysiological mechanism in the evolution of obese individuals to chronic kidney disease involves the production of adipokines by adipose tissue, namely leptin, adiponectin, tumor necrosis factor alpha and angiotensin II. Obesity generates increased insulin resistance, hyperlipidemia and atherosclerosis, increasing cardiovascular risk and renal tubular sodium reabsorption. The latter causes volume expansion by the action of the renin-angiotensin-aldosterone system, the main cause of the development of systemic arterial hypertension associated with obesity and causing glomerular hyperfiltration, which, associated with insulin resistance and DM, leads to a reduction in the glomerular filtration rate. FSGS is the histological type of glomerular disease most associated with obesity and clinically manifests itself through nephrotic syndrome and progressive loss of renal function. [8]

Chronic kidney disease can be classified using the glomerular filtration rate (GFR) and the prognosis for progression is assessed using albuminuria, table 1:

Category	Albuminuria level	Interpretation
A1	<30mg/g	Normal or slightly increased
A2	30 a 300 mg/g	moderately increased
A3	>300 g/g	severely increased

Table 1: Categories for albuminuria

An unpublished study carried out in a large Brazilian obesity center in São Paulo compared 2 groups of patients with CKD in the early stages with type II DM and obesity, one of them submitted to bariatric surgery

of the gastric bypass type and the other to the best drug treatment available until now. the moment. A total of 100 patients were compared over a 24-month follow-up of surgical or clinical treatment and as a main result of the study, the group undergoing gastric bypass had an 81.9% remission rate of CKD in stages G1 to G3 and A2 to A3 against 48.2% in the group submitted to the best clinical treatment. In addition, as secondary endpoints of the study, the group submitted to gastric bypass had better rates in: reduction of glycated hemoglobin (2.6% against 2.2% of the clinical group), reaching LDL target < 100 (73% x 51 %), target triglycerides < 150 (81% vs. 41%), achieving normal BMI (50% vs. 0), reduction in use of daily medications for metabolic control (mean of 1 vs. 6 in the clinical group), and superior quality of life, evaluated through a questionnaire.[7]

Another important cohort study on the subject published in the journal "Kidney International" in 2016 showed that bariatric surgery is associated with a lower risk of loss of renal function in patients with severe obesity, with or without SAH or DM and can be used as a way to of treatment to prevent or slow the progression of chronic kidney disease. A 9-year follow-up was performed, with an analysis of 1970 patients in total with a 30% or more drop in glomerular filtration rate, of which half (985) underwent bariatric surgery and the other half did not. Patients in the surgical group had a 58% lower risk of worsening GFR by 30% or more and a 57% lower risk of doubling their creatinine level or progressing to end-stage chronic kidney disease, compared to the control group. In addition, over the 5 years of the study, patients undergoing bariatric surgery had a mean drop in GFR of 0.7 ml/min/1.73m2, compared to a drop of 6.3 ml/min/1.73m2 in the control group. [9,10]

Metabolic surgery is indicated for patients with a BMI above 40 kg/m2 or 35 to 39.9 kg/m2 if glycemic control is uncontrolled and must also be considered for patients with a BMI of 30 to 34.9 kg/m2 if hyperglycemia is refractory to optimized medication. [11]

Two theories were initially proposed to explain the benefit of bariatric surgery in controlling type 2 DM. One of them states that control is the result of the discharge of nutrients from the chyme directly into the distal intestine, stimulating the release of GLP-1, an incretin secreted by the distal intestinal L cells in response to intestinal nutrients. This stimulates insulin secretion and proliferation of the anti-apoptotic effect of beta cells. The other hypothesis is based on the exclusion of the duodenum and the proximal jejunum from the alimentary transit, positively interfering in the production of hormones that act directly on the pancreatic beta cells, favoring the production of insulin.[12]

Comparing results between type 2 diabetic patients undergoing surgery and patients with clinical treatment and lifestyle changes, it was observed that surgery presents an important and lasting improvement in type 2 DM with better glycemic control and a decrease in cardiovascular risk, in addition to decline in long-term mortality. In a follow-up of 05 years postoperatively, randomized studies documented a sustained remission of 30 to 63% of type 2 DM in patients, with a mean disease-free time after gastric bypass with Roux-en-Y reconstruction of 8.3 years. Most patients who undergo surgery have improved glycemic control for at least 5 to 15 years. [12,13]

Young patients with short-term DM (less than 08 years), non-insulin dependent and with adequate glycemic control before surgery have high rates of disease remission after bariatric surgery, with low risk of recurrence. [11]

Bariatric surgery is more cost-effective for patients with type 2 DM compared to patients

undergoing medical treatment. [11]

At the 2nd Diabetes Surgery Summit (DSS-II), a consensus endorsed by 45 professional societies worldwide, bariatric surgery was more efficient than conservative treatment in sustained weight loss and blood glucose reduction, with a mean drop in glycated hemoglobin of 2.0% with surgery compared to 0.5% with drug treatment. [11]

The measurement of C-peptide allows assessing the secretion capacity of pancreatic β-cells, differentiating cases of type 1 diabetes from those of type 2. In type 2 DM there is insulin resistance and consequently a compensatory increase in insulin production and release, which can cause beta cell damage. Endogenous insulin production is reflected in the C-peptide level, therefore it can be considered an independent marker of insulin secretion; values lower than 1.0 indicate pancreatic failure, indicating type 1 DM or the need for insulinization in type 2 DM. C-peptide levels tend to be higher the higher the BMI, and weight loss after 01 year of bariatric surgery leads to a reduction of approximately 64% of its levels, in addition to type 2 DM remission in 78% of cases. Serum C-peptide levels can be predictive of surgical success in type 2 DM remission. Values below 3, between 3-6 and above 6 ng/ml are associated with remission rates of 55.3%, 82% and 90.3 % respectively, after bariatric.[14,15]

CARDIOVASCULAR RISK

Cardiovascular risk stratification can be performed using the Framingham risk score, which is used to assess cardiovascular risk in 10 years, classifying individuals as high, intermediate or low risk. It is considered a reliable, simple and low-cost way to identify outpatients at high risk for cardiovascular disease. The initial classification is based on the patient's age and sex, followed by a clinical evaluation of the following criteria: Smoking, SAH, obesity, male gender, age>65, family history and previous cardiovascular event (H<55 and M<65), considered intermediate risk criteria; and previous cerebrovascular accident (CVA), previous acute myocardial infarction (AMI), transient cerebral ischemia or nephropathy or retinopathy or aortic aneurysm or symptomatic carotid stenosis, peripheral lesion or target organ lesion, considered high-risk criteria.

The 10-year risk of a cardiovascular event is <10% for low risk, 10% to 20% for intermediate risk, and >20% for high risk. [16]

Metabolic syndrome is defined as the presence of a set of cardiovascular risk factors due to metabolic alterations such as insulin resistance and visceral fat distribution. Patients with the metabolic syndrome have a 2.5-fold increased risk of coronary artery disease (CAD) and a 1.5-fold increase in overall mortality. According to the "National Cholesterol Education Program", the criteria for metabolic syndrome are: central obesity (abdominal circumference >102cm in men and >88cm in women, high levels of triglycerides (>150), low levels of HDL (<40cm in men and <50cm in women), elevated blood pressure (BP > 130x85 mmHg) and glucose intolerance. [16,17,18]

The impact of bariatric surgery on metabolic syndrome was evaluated by a study carried out in a Brazilian study with patients from an obesity outpatient clinic in Vitória, ES. As a result of the study, at the end of the first year, remission of the metabolic syndrome occurred in 38 of the 47 patients evaluated. (80,9%). [18]

In addition, in general, the higher the BMI, the greater the number of comorbidities associated with obesity, cardiovascular risk and mortality rate. Chronic noncommunicable diseases (NCDs) are responsible for about 70% of global deaths, equivalent to more than 38 million deaths per year. Of these, 45% of

all CNCD deaths in the world, more than 17 million, are caused by cardiovascular diseases (CVD). The same occurs in Brazil, where 72% of deaths result from NCDs, with 30% due to CVD, 16% to neoplasms and 6% to respiratory diseases. Cardiovascular disease has been identified as the main cause of mortality since the 1960s in Brazil.[19]

OBESITY AND NEOPLASMS

Currently, according to the World Health Organization (WHO), 13 out of every 100 cases of cancer in our country are attributed to overweight and obesity. Excess body fat represents a risk for the development of at least 13 types of cancer, such as: esophagus, stomach, colon and rectum, pancreas, kidneys, liver, prostate, breast, ovary, endometrium, meningioma, thyroid and multiple myeloma. The increased risk of developing cancer is due to the fact that excess body fat causes a state of chronic inflammation in the body and increased levels of various hormones. [20]

Data collected from cohort studies suggest that every 5kg/m2 increase in BMI increases the risk of death from cancer by up to 10%. In patients with grade I obesity who do not smoke, the risk of death from cancer can reach up to 38% in men and 33% in women, while patients with grade III obesity have a 52% increase in the risk of death from cancer in men and up to 62 % in women. [20,21]

The chronic inflammatory state present in obesity favors the development of neoplasms and is called "metaflammation", induced by tissue hypoxia, which activates the hypoxia-inducing factor (HIF-1alpha), promoting infiltration of macrophages and monocytes in the adipose tissue and the secretion of TNF-alpha, which activates nuclear transition factor and tumor necrosis. [20]

Obesity is an independent factor for reducing the body's protective antioxidant activities and increasing systemic oxidative stress.[20]

Studies have shown that treating obesity reduces the risk of developing cancer by 76%. Weight loss induced by both the gastric bypass technique and sleeve gastrectomy promoted significant remission of proneoplastic proteins, regardless of the degree of obesity and insulin concentration. [20]

A positive family history is recognized as one of the most relevant risk factors for estimating the personal risk of developing cancer. It is estimated that the prevalence of cancer in first-degree relatives is approximately 24% in white individuals and 16% in black individuals, varying according to the type of cancer. In addition, an increase in the personal risk of cancer by 2 to 4 times is estimated in the presence of cancer in first-degree relatives. [22]

AGE

Individuals over 60 years old are considered elderly in Brazil. It is estimated that in this population, the incidence of obesity is 8% of men and 16% of women and the main objective of bariatric surgery in this age group is to improve the quality of life with a reduction in comorbidities and disability. The indications for the obese are the same as for the rest of the population, as described in the study. [23]

With the aging of the population, there is an increase in the number of bariatric surgeries in the elderly, and in the United States they already correspond to approximately 10% of the procedures. The big question of indication in the elderly is the increase in surgical morbidity and mortality, especially in patients over 65 years of age. Studies show an increase in postoperative complications in groups aged over 65 years, but the surgical result in weight loss and improvement in functionality and comorbidities is the same. [23]

The American Database (National Hospital

Discharge Survey and National Inpatient Survey) showed a mortality of 3.2% in the elderly population compared to 0.2 to 0.7% in the youngest in an evaluation of 25,000 bariatric surgeries, while a American study published in 2006 reports a mortality rate of 4% and the risk of surgical complications of up to 20% in the elderly.[23]

This way, we estimate that patients between 60 and 65 years old must have a greater urgency to operate, being prioritized, this not to increase surgical risks due to the long waiting list.

GASTROESOPHAGEAL REFLUX DISEASE (DRGE)

Gastroesophageal reflux disease is associated with obesity, with symptoms present in 50% of obese patients. Factors such as higher abdominal and intragastric pressure, and higher incidence of hiatus hernia are related to the onset of reflux in these individuals. Barrett's Esophagus, which is one of the main complications of gastroesophageal reflux, has a 2.5 times greater risk of developing it in obese people, and is characterized by the presence of intestinal metaplasia in the esophageal mucosa, that is, the replacement of stratified squamous epithelium by ciliated columnar epithelium with intestinal cells in response to the acid aggression of reflux. The risk of developing cancer, distal esophageal adenocarcinoma, in patients with Barrett's is approximately 0.2 to 2.9% per year, about 30 to 125 times greater than that of the general population.[25,26]

Gastric bypass has been the surgery of choice for obese patients with reflux disease. Studies show an improvement of approximately 94% of patients with typical symptoms of reflux after surgery in 09 months.[25]

NON-ALCOHOLIC FATTY LIVER DISEASE

Non-alcoholic fatty liver disease is considered the hepatic component of the metabolic syndrome, with an estimated prevalence of 20% of the world population, but in risk groups such as obese people who will undergo bariatric surgery, it reaches up to 95% of cases. The prevalence in type 2 diabetics is around 75% and in patients with hypertriglyceridemia up to 50%. [27]

A study carried out in Turkey, the country with the highest prevalence of obese people in Europe, found a rate of steatosis in 60.1% of the studied population, 45% of whom were obese and 35% were overweight. [28]

Hepatic fat increases insulin resistance and reduces the suppression of hepatic glucose production, generating hyperglycemia and worsening insulin resistance. A meta-analysis involving 15 studies with a total of 766 patients evaluated the degree of hepatic steatosis before and after bariatric surgery through liver biopsy. Improvement or resolution of hepatic steatosis was seen in 91% of individuals, 81% in cases of hepatic steatosis, 65% in cases of fibrosis and 69.5% with complete resolution of non-alcoholic steatohepatitis. [29,30]

The diagnosis of NASH is made through imaging tests, such as ultrasound and tomography, with sensitivity ranging from 60 to 90%, laboratory tests and histopathology (biopsy). The latter is considered the gold standard in the diagnosis.[31]

The focus of treatment is lifestyle change with weight loss. A 10% weight loss is enough to improve transaminases and other factors related to the metabolic syndrome. Studies show that bariatric surgery improves NASH and hepatic steatosis in up to 80% of cases.[31]

In 2017, a study was conducted in our service evaluating the incidence of non-alcoholic steatohepatitis in patients with hepatic steatosis undergoing Roux-en-Y gastric bypass. 18.2%

of patients were diagnosed with NASH on biopsy during surgery. These had higher levels of insulin resistance, with increased insulin production and higher fasting blood glucose values, when compared to the group without a diagnosis of NASH. In addition, patients with a histopathological diagnosis of NASH had higher rates of dyslipidemia, with higher levels of total cholesterol and LDL. [31]

QUALITY OF LIFE ASSESSMENT

Obesity is currently considered one of the biggest public health problems in the world and can be defined as a chronic, non-contagious disease, difficult to control, marked by excessive accumulation of fat in adipose tissues. We are facing a veritable epidemic of obesity, due to the growing number of obese people in the world due to changes in lifestyle and eating habits that are characteristic of the 21st century. It is a disease that combines the interaction of social, behavioral, cultural, psychological, metabolic and genetic factors. [32]

Obesity can lead to social isolation, experiential avoidance, and self-image distortion. In addition, it is widely associated with the development of eating and psychological disorders, mainly depression, anxiety and even suicide, orthopedic disorders and the intensification of other diseases, as previously mentioned in this study, such as hypertension, diabetes mellitus, cardiovascular diseases, among others. [32]

The definition given by WHO considers that quality of life is an individual's perception of their position in life in the context of the culture and value systems in which they live and relates to their goals, expectations, standards and concerns. [32]

There are various forms of obesity treatment, such as psychotherapies, medications, diets and physical activity programs, but often the morbidly obese are not successful only through these resources, which ends up reflecting in frustration, constant anxiety, stress, depression, continuity inappropriate eating behavior and the worsening of the clinical picture of morbidity and comorbidities. Given this scenario, bariatric surgery has been shown to be a promising treatment option for individuals affected by severe obesity. Recent studies indicate that there was an improvement in the functional ability, vitality and general health of obese patients undergoing bariatric surgery, to the detriment of the pre-surgical group, in which there was a significant reduction in the degree of quality of life measured.[32]

As a way of assessing and classifying the impact of obesity on quality of life, we chose to use the examiner's objective assessment of the impact of obesity on locomotion, mobility and patient hygiene.

TIME OF WAIT IN OTHER SURGICAL QUEUES

In our service, we frequently observe obese patients waiting for other surgical queues, mainly orthopedic surgeries and incisional hernias. These patients are not able to lose enough weight on their own to reach a BMI below 30, recommended in these queues to obtain surgical release. This way, they have a huge loss of quality of life due to the surgery they are waiting for and are not operated on. We chose to include this criterion in our priority queue for bariatric surgery, allowing the patient to lose weight with the bariatric surgery and manage to reach the appropriate BMI for the other surgery that awaits.

Based on the literature review, on the previously studied portion of patients waiting in line for bariatric surgery at the service and its results, and on the increase in our demand for prioritization of severe cases, we propose in this study a score to classify obese patients waiting in line for bariatric surgery

at Hospital do Servidor Público Municipal de São Paulo, taking into account cardiovascular risk according to the Framingham Score, chronic kidney disease in reversible stages, insulin-dependent diabetes mellitus, high risk for cancer, high BMI, age between 60 and 65 years, gastroesophageal reflux, waiting in other surgical queues and evaluation of quality of life.

Follow the score proposed in the Table below:

Commorbity	01 point	02 points	03 points
Chronic kidney disease	-	Albuminúria > 30 to 300	Albuminuria > 300
Insulin dependent diabetes duration	< 04 years	4 to 6 years	6 to 8 years
Diabetes mellitus insulin dependent (with optimized clinical treatment)	HbA1C <9% with C-peptide 1.0 to 3.0	HbA1C >9% with C-peptide 1.0 to 3.0	HbA1C >9% and C-peptide >3.0
Hepatic steatosis	Grade 3	non-alcoholic steatohepatitis	Cirrhosis
Framingham score	High risk		-
History of neoplasm	1st degree relative	Personnel	-
Reflux Disease	Esophagitis - Grade D	Barrett's esophagus	-
BMI	Over 50	Over 60	-
Age	60 to 65 years old	65 to 69 years old (selected cases)	-
Time of wait in other surgical queues	Yes		
Mobility/ Locomotion	Cane / walker	Wheelchair	-
Bad Hygiene	Skin lesions		

Table 3: Server Obesity Score (SOS)

Proposed classification: Degrees of priority

- Green: 0 to 2 points
- Yellow: 3 to 4 points
- Red: greater than or equal to 5 points

Patients classified as green can follow the queue in chronological order, while yellow patients must be summoned to the multidisciplinary preparation group within 01 year and red patients within 06 months.

CONCLUSION

The SOS protocol (Server Obesity Score) was elaborated, defining severity criteria and prioritization of patients for bariatric surgery, easy to replicate and with the objective of reducing morbidity and mortality of obese patients and preventing the progression of serious and potentially reversible diseases.

REFERENCES

1. Perez JAC, et al. Obesity Surgery Score (OSS) for prioritization in the bariatric surgery waiting list: a need of public health systems and literature review. Springer Science and Business media, Espanha, 2018.

2. Tonatto-Filho AJ, et al. Cirurgia bariátrica no sistema público de saúde brasileiro: o bom, o mau e o feio, ou um longo caminho a percorrer. Sinal amarelo! ABCD, Porto Alegre, RS, Brasil, 2019.

3. Barroso TA, et al. Associação entre a obesidade central e a incidência de doenças e fatores de risco cardiovascular. International Journal of Cardiovascular Science, Rio de Janeiro, Brasil, 2017.

4. Sociedade Brasileira de Cirurgia Bariátrica e Metabólica. Cirurgia bariátrica cresce 84,73% entre 2011 e 2018. Notícia destaque. 2019.

5. Rabacow FM, Azeredo CM, Rezende LF. Deaths Attributable to High Body Mass in Brazil. Prev Chronic Dis 2019;16:190143. DOI: http://dx.doi.org/10.5888/pcd16.190143

6. Caetano, L. R, Pellegrini, F. F. Análise dos pacientes na fila de espera para realizar cirurgia bariátrica no Hospital do Servidor Público Municipal de São Paulo. Trabalho de Conclusão de Curso. Hospital do Servidor Público Municipal, 2019.

7. Cohen, R. V. et al. Effects of Gastric Bypass vs Best Medical Treatment on Early-Stage Chronic Kidney Disease in Patients With Type2 Diabetes and Obesity. A Randomized Clinical Trial. JAMA Surgery, 2020.

8. Junior GBS, et al. Obesidade e doença renal. Jornal Brasileiro de Nefrologia. Fortaleza, CE, Brasil, 2017.

9. American Diabetes Association; Obesity Management for the Treatment of Type2 Diabetes: Standard of Medical Care in Diabetes. Diabetes care, 2018.

10. Grams, M. E. et al. Bariatric surgery is associated with improvement in kidney outcomes. Kidney Int, 2016.

11. Cummings, D. E. et al. Metabolic Surgery in the Treatment Algorithm for Type 2 Diabetes: a Joint statement by International Diabetes Organizations. Diabetes Care, 2016.

12. Zeve, J. L. M et al. Obesos diabéticos tipo 2 submetidos à derivação gástrica em Y de Roux: Análise de resultados e influência nas complicações. ABCD Arq Bras Cir Dig Artigo Original 2013;26(Suplemento):47-52.

13. Zeve, J. L. M et al. Efeitos da gastroplastia e bypass gastrointestinal no tratamento da diabetes tipo 2. Universidade de Brasília, 2012.

14. Lee WJ, et al. C-peptide predicts the remission of type 2 diabetes after bariatric surgery. Obes Surg. 2012 Feb;22(2):293-8.

15. Sjostrom, L, Torgerson, J.S. The Swedish Obese Subjects (SOS) study- rationale and results. Int J Obes Relat Metabol Disord, 2001. DOI: 10.1038/sj.ijo.0801687.

16. Ferreira, M. E. Síndrome metabólica e doenças cardiovasculares: Do conceito ao tratamento. Arq Catarin Med, 2016.

17. Sá, L. G. S, et al. Frequência de fatores de risco cardiovascular antes e 6 e 12 meses após gastroplastia. Rev Assoc Med Bras, 2013.

18. Pareja, J. C., Geloneze, B. Cirurgia Bariátrica Cura a Síndrome Metabólica? Arq Bras Endocrinol Metabol, 2006

19. Oliveira, G. M.M. et al. Estatística cardiovascular - Brasil 2020. Arq. Bras. Cardiolol 115 (3). 2020. DOI https://doi.org/10.36660/abc.20200812.

20. Ferraz, AAB, Siqueira LT. Obesidade e câncer. Anais do Gastrão, São Paulo, SP, Brasil, 2015.

21. Pinho, A. C., Melo, M. E. Câncer e obesidade: Um alerta do INCA. Rede câncer, 2017.

22. Christou N. V. et al. Bariatric surgery reduces cancer risk in morbidly obese patients. Surg Obes Relat Dis. 2008 Nov-Dec;4(6):691-5.

23. Pajecki D, et al. CIRURGIA BARIÁTRICA EM IDOSOS: RESULTADOS DE SEGUIMENTO DE CINCO ANOS. ABCD Arq Bras Cir Dig;28(Supl.1):15-18. 2015.

24. Nassif P.A.N et al. QUANDO E POR QUE OPERAR IDOSO OBESO. ABCD Arq Bras Cir Dig;28(Supl.1):84-85. 2015.

25. Ariede, B. L., et al. Gastrectomia vertical e bypass gástrico em Y-de-Roux induzem doença do refluxo gastroesofágico no pós operatório? ABCD, 2014.

26. Leme, P.L.S, Silva, R. A., Hohne O. P. Esôfago de Barrett. Prevalência, risco de adenocarcinoma e avaliação endoscópica. Rev. Assoc. Med. Bras, 2003.

27. Younossi Z, Stepanova M, Ong JP, et al. Esteatose hepática não alcoólica é a causa de crescimento mais rápido do carcinoma hepatocelular em candidatos a transplante de fígado. Clin Gastroenterol Hepatol 2019; 17:748-55

28. Kaya E, Yilmaz, Y. Non-alcoholic fatty liver disease: A growing public health problem in Turkey. Turk J Gastroenterol, 2019. Doi: 10.5152/tjg.2019.18045.

29. Ferraz, A, et al. Esteatohepatite não alcoólica em pré-operatório de bypass gástrico: ausência de correlação com grau de obesidade. ABCD, 2013.

30. Couto, O. F. M. Doença hepática gordurosa não alcoólica. Sessões clínicas em rede, 2019.

31. Castro, D. L, Franca, F. T. Relação da esteatohepatite não alcoólica com a síndrome metabólica em pacientes submetidos ao bypass gástrico em Y de Roux. Trabalho de Conclusão de Curso. Hospital do Servidor Público Municipal, 2017.

32. Ferreira, N. M. et al. Avaliação da qualidade de vida em obesos pretendentes à cirurgia bariátrica: Qualidade de Vida em obesos pré-bariátrica. Psicologia, Saúde e Doenças, 2019. DOI: http://dx.doi.org/10.15309/19psd200101

33. Versão Brasileira do Questionário de Qualidade de Vida -SF-36. Disponível em http://qualipes.com.br/lib/download/questionariosf-36.pdf