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NEW CONCEPT

Obesity Surgery Score (OSS) for Prioritization in the Bariatric Surgery Waiting List: a Need of Public Health Systems and a Literature Review

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Abstract

Background In the last decades, we have experienced an increase in the prevalence of obesity in western countries with a higher demand for bariatric surgery and consequently prolonged waiting times. Currently, in many public hospitals, the only criterion that establishes priority for bariatric surgery is waiting time regardless of obesity severity.

Methods We propose a new, simple, and homogeneous clinical prioritization system, the Obesity Surgery Score (OSS), which takes into account simultaneously and equitably the time on surgical waiting list and the obesity severity based on three variables: body mass index, obesity-related comorbidities, and functional limitations. We have reviewed the current literature related to obesity clinical staging systems, and we have carried out an analysis of our patients in waiting list and divided their characteristics according to their degree of severity (A, B, or C) in the OSS. Patients with OSS grade C have a higher mean BMI, greater severity in comorbidities, and greater socio-labor impact. The current surgery waiting time of our series is of 26 months. Currently, 27 patients (51.9%) with OSS grade B and 15 patients (51.7%) with OSS grade C have been on our waiting list for more than 1 year.

Conclusion Since the obesity severity, the waiting time and its clinical consequences are associated with an increase in morbidity and mortality, it is important to apply a structured prioritization system for bariatric surgery waiting list. This allows prioritization of patients at greater risk, improves patient prognosis, and optimizes costs and available health resources.

Keywords Morbid obesity · Body mass index · Bariatric surgery · Obesity staging · Risk factors · Cardiovascular diseases · Waiting list · Waiting time · Costs · Public hospitals · Hospital purchasing

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Introduction

The increase in obesity prevalence in western countries, with their associated comorbidities [1, 2], generates a greater demand of bariatric surgery. In 1991, the American National Institutes of Health (NIH) established as candidates for bariatric surgery patients with a body mass index (BMI) > 40 kg/m^2 or between 35 and 40 kg/m^2 and comorbidities such as type 2 diabetes mellitus (DM) [3], hypertension (HT) [4], dyslipidemia (DLP), or obstructive sleep apnea syndrome (OSAS). At present, we are witnessing the rise of so-called "metabolic surgery" in patients with DM and BMI between 32 and 35 kg/m^2 (in some groups even with lower BMI), especially in patients with difficult medical management or associated to comorbidities [5]. For this reason, the volume of patients that could benefit of bariatric surgery could increase considerably, with a consequent increase in health costs and waiting times (WT) [6].

In the clinical evolution of excess weight, concomitant comorbid conditions can appear, increasing the overall cardiovascular risk [7–11]. Despite of this, in the Spanish National Health System, morbid obesity is included in the group of procedures with a priority score 3 (the pathology allows delayed treatment since it does not produce significant sequelae) [12]. In many hospitals, the only criterion that prioritizes surgery is the WT, without taking into account the obesity severity. This fact could have negative consequences and serious sequelae in patients at greater risk while waiting for surgery. Therefore, it is necessary to establish a prioritization system in morbid obese patients with a higher degree of severity, in order to reduce morbimortality as a result of protracted WT.

Methodology

The criteria that should be used to establish a waiting list prioritization system should be the following:

- Be simple and quick to apply by clinicians
- Provide relevant information about the patient based on established criteria
- Be reevaluated according to the evolution of comorbidities

Taking into account these three characteristics, we have developed the Obesity Surgery Score (OSS), which allows to classify candidates for bariatric surgery according to their degree of severity, to establish a prioritization order within a surgical waiting list. The OSS consists of three main variables: BMI, obesity-related comorbidity, and socio-labor impact (Table 1). We excluded sex and age as they are controversial variables in multiple studies.

A) BMI. BMI, although with many limitations, is the current anthropometric classification tool of obesity proposed by the main scientific societies such as *Spanish Society for the Study of Obesity* (SEEDO), *Spanish Society for Obesity Surgery* (SECO), *American Society of Bariatric Surgery* (ASBS), and *World Health Organization* (WHO), and it is the main selection parameter for bariatric surgery. Overall, the higher the BMI, the greater the obesity-related diseases, cardiovascular risk, and mortality [7–11], and therefore, a higher OSS reached. We classify BMI (kg/m^2) in four groups (score 0–3), taking into account the current indications of bariatric surgery:

- BMI < 40: 0 point
- BMI 40–49.9: 1 point
- BMI 50–59.9: 2 points
- BMI ≥ 60: 3 points

B) Obesity-related comorbidity. The severity of obesity-related comorbidities, with poor metabolic control, multi-pharmacological treatments, established organic damage, etc., leads to greater morbimortality and surgery has demonstrated significant benefits. We established four groups (score 0–3):

- No obesity-related risk factors: 0 point
- Mild comorbidity (subclinical metabolic changes): 1 point
- Moderate comorbidity (established chronic disease): 2 points
- Severe comorbidity (severe-limiting pathology or established organ damage): 3 points

C) Socio-labor impact. Severe obesity is associated with reduced health-related quality of life (HRQL). Excess of weight may have a negative impact on the psychological and social functioning of patients, and therefore, the socio-labor impact should also be considered as a criterion for surgery prioritization. The management of obese patients must be multidisciplinary and in our obesity surgery protocol, the assessment by the psychiatrist is mandatory, who is responsible to determine the socio-labor repercussion based on three aspects: psycho-affective, relationship with socio-family environment, and daily life activities. Short Form (SF)-12, Euroqol (EQ)-5D, and Impact of Weight on Quality of Life (IWQOL)-Lite are validated tools to determine the HRQL, which may help the physician calculate the degree of socio-labor impact of obese patients in mild, moderate, or severe [13]. We classify the socio-labor impact into three groups (score 0–2):

- Mild socio-labor impact (0 point). Situation close to normal, with a slight change that correspond to limitations of obesity (low self-esteem, slight decrease in functional capacity).

Table 1 Obesity Surgery Score (OSS)

Categories	Description	Score
BMI (kg/m^2)	< 40	0
	40-49.9	1
	50-59.9	2
	≥ 60	3
Obesity-related comorbidity	**No obesity-related risk factors**	0
	Mild (subclinical metabolic changes)	1
	- Carbohydrate intolerance - Hypertension grade I (140-159/90-99) - Dyslipidemia - Non-erosive symptomatic gastroesophageal reflux	
	Moderate (chronic disease established)	2
	- Non-insulin dependent diabetes with HbA1c <8% - Hypertension ≥ grade II - Metabolic syndrome - Obstructive sleep apnea syndrome (with CPAP/BiPAP) - Dyspnea on small exertion - Severe Osteoarthropathy (non-disabling) - Symptomatic cholelithiasis - Infertility / Erectile Dysfunction - Erosive gastroesophageal reflux (grade A-B Los Angeles classiffication)	
	Severe (severe-limiting pathology or organic damage)	3
	- Insulin-dependent diabetes, HbA1c >8% or metadiabetic complications - Refractory hypertension (need for ≥ 3 drugs) - Dyspnea at rest - Heart failure - Ischemic heart disease - Atrial fibrillation - Stroke - Deep venous thrombosis / pulmonary thromboembolism - Disabling osteoarthropathy - Erosive gastroesophageal reflux (grade C-D Los Angeles classiffication) or Barrett's esophagus	
Socio-labor impact	Mild	0
	Moderate	1
	Severe	2
Total Score		0-8
Grade	**A** (0-2)	**B** (3-5) / **C** (6-8)

- Moderate socio-labor impact (1 point). Psychopathological symptoms (anxiety-depressive disorder without medical treatment), poor social relations, and moderate limitation of normal daily life activities.
- Severe socio-labor impact (2 points). Major psychopathological symptoms (anxiety-depressive disorder requiring medication), social isolation, severe problems in the family or couple, dependent for most daily life activities, and loss of employment or sick leave.

The total score will classify patients into three groups according to their degree of severity:

- Grade A: 0–2 points. Lower degree of severity
- Grade B: 3–5 points. Moderate degree of severity
- Grade C: 6–8 points. Higher degree of severity

The score within each OSS category is not cumulative and the highest score is selected. The result is expressed with the degree (A/B/C) and in brackets the corresponding score. E.g., A(2) implies a grade A and a total score of 2 points in the OSS. It is of special utility to calculate the OSS at the time of inclusion in the surgical waiting list in order to know, in a quick and intuitive way, the profile of obesity severity. This scale is dynamic and may suffer variations during WT.

Many countries with public health system have prolonged WT. The calculated average waiting time for bariatric surgey in Canada is just over 5 years [14, 15]. We define WT as the time of entry in surgical waiting list, once preoperative evaluation is completed. We not only take into account the obesity severity, but also the WT. We propose an easy-to-apply formula, the OSSWT (Obesity Surgery Score adjusted by Waiting Time), which allows to discriminate patients with higher priority according to their OSS and WT (Table 2).

E.g., OSSWT formula, in a hospital with a 36-month WT for bariatric surgery, patient 1 has an OSS of B(3) and has been waiting for 25 months, and patient 2 has an OSS of C(6) and has been waiting for 11 months.

Patient 1

$$OSSWT = [(3/8) + (25/36)] = [(0.375) + (0.694)] = 1.069.$$

Patient 2

$$OSSWT = [(6/8) + (15/36)] = [(0.75) + (0.417)] = 1.167.$$

When adjusting the OSS by WT, patient 2 is prioritized taking into account these two variables.

We have carried out a retrospective analysis of our patients in waiting list (Table 3). Patients with OSS grade C have a higher mean BMI, greater severity in comorbidities, and greater socio-labor impact. However, with the current criteria, these patients are not prioritized for the degree of severity. The current surgery WT of our series is 26 months. Currently, 27 patients (51.9%) with OSS grade B and 15 patients (51.7%) with grade C have been on our waiting list for more than 1 year.

Discussion

According to a SEEDO Consensus Document, 38% of the adult population are overweight (BMI 25–29.9 kg/m^2) and 14.5% obese (BMI > 30 kg/m^2), 13.4% of men and 15.7% of women [16]. Morbid obesity and especially associated diseases decrease life expectancy and increase rate of sudden and global death of obese patients compared to subjects with normal weight of the same age [17]. Prolonged WT increases patients' risk of suffering health impairments over time. Moreover, most wait-listed patients refer physical, mental, and economic deterioration during the WT [13].

There are scales that determine prognosis and prioritization of patients in surgical waiting list for other pathologies, such as liver transplants, *Model for End-stage Liver Disease* (MELD) in adults or *Pediatric End-stage Liver Disease* (PELD) in children [18]; prioritization scales for knee and hip prostheses; elective cataract surgery [19, 20]. Currently in many countries with public health systems, the only criteria that establishes priority for bariatric surgery is WT regardless of the obesity severity. This is a serious problem in hospitals with protracted WT. Other scales such as the POSSUM (*Physiological and Operative Severity Score for the enUmeration of Mortality and Morbidity*) which

Table 2 Obesity Surgery Score adjusted by Waiting Time (OSSWT)

OSSWT = [(OSSp/OSSmax) + (WTp/WTt)]

OSSWT Obesity Surgery Score adjusted by Waiting Time, *OSSp* patient Obesity Surgery Score, *OSSmax* maximum Obesity Surgery Score (always equal to 8), *WTp* patient Waiting Time, *WTt* total Waiting Time

Table 3 Clinical features of patients in bariatric surgery waiting list

	Overall		Grade A		Grade B		Grade C	
N	98		17		52		29	
Sex (male : female)	28 : 70		4 : 13		14 : 38		10 : 19	
Age (mean)	42.8 [22-69]		37.5 [24-58]		43.3 [22-69]		45.1 [28-58]	
BMI (kg/m^2) (mean)	48.3 [35-73.6]		43.7 [36-56.7]		47.2 [35-61]		53.2 [40-73.6]	
Comorbidities	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Type 2 Diabetes Mellitus	53	54.1	2	11.8	27	51.9	24	82.8
- Carbohydrate Intolerance	14/53	26.4	1/2	50	6/27	22.2	7/24	29.2
- HbA1c < 8%	22/53	41.5	1/2	50	15/27	55.6	6/24	25
- HbA1c > 8%	17/53	32.1	0	0	6/27	22.2	11/24	45.8
Hypertension	67	68.4	3	17.6	41	78.8	23	79.3
- Grade I	53/67	79.1	3/3	100	33/41	80.5	17/23	74
- ≥ Grade II	8/67	11.9	0/3	0	5/41	12.2	3/23	13
- Refractory	6/67	9	0/3	0	3/41	7.3	3/23	13
Dyslipidemia	53	54.1	3	17.6	32	61,5	18	62.1
Metabolic syndrome	34	34.7	0	0	18	34.6	16	55.2
Gastroesophageal reflux	56	57.1	5	29.4	34	65.4	17	58.6
- Non-erosive symptomatic	41/56	73.2	5/5	100	24/34	70.6	12/17	70.6
- Grade A-B	9/56	16.1	0/5	0	6/34	17.6	3/17	17.6
- Grade C-D-Barrett	6/56	10.7	0/5	0	4/34	11.8	2/17	11.8
Severe Dysnea	17	17.3	0	0	5	9.6	12	41.4
- Small exertion	11/17	64.7	0	0	4/5	80	7/12	58.3
- At rest	6/17	35.3	0	0	1/5	20	5/12	41.7
Sleep apnea (CPAP/BiPAP)	27	27.5	0	0	13	25	14	48.3
Severe Osteoarthropathy	40	40.8	0	0	21	40.4	19	65.5
- Non-disabling	23/40	57.5	0	0	16/21	76.2	7/19	36.8
- Disabling	17/40	42.5	0	0	5/21	23.8	12/19	63.2
Symptomatic cholelithiasis	4	4.1	0	0	3	5.8	1	3.4
Infertility / Erectile dysfunction	1	1.02	0	0	0	0	1	3.4
Heart failure	3	3.1	0	0	1	1.9	2	6.9
Ischemic heart disease	1	1	0	0	0	0	1	3.4
Atrial fibrillation	6	6.1	0	0	4	7.7	2	6.9
Stroke	0	0	0	0	0	0	0	0
Deep venous thrombosis / pulmonary thromboembolism	4	4.1	0	0	2	3.8	2	6.9
Social-labor impact	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
- Mild	37	37.7	15	88.2	22	42.3	0	0
- Moderate	33	33.7	2	11.8	23	44.2	8	27.6
- Severe	28	28.6	0	0	7	13.5	21	72.4

estimates morbimortality in surgical patients, cannot be used for prioritization since the second part of this formula, the surgical aspect, has not been performed when using the scale. Moreover, it is difficult to apply in a functional (non-obligatory) surgery such as bariatric surgery [21].

In a retrospective review of Dalhousie University (Halifax, Canada), 1399 patients were analyzed in bariatric surgery waiting list, with 22 deaths (1.57%) occurred during WT. The mean age of this group of patients was 62.7 years, mean BMI 51.5 kg/m^2, and mean time from inclusion to death 21.6 months. The average of comorbidities per patient was 6.9. The most frequent cause of death was cancer (23%), cardiological pathologies (18%), and infectious (14%). The authors conclude by emphasizing the need to develop judicious strategies that allow a better triage and prioritization of this vulnerable population in centers with prolonged WT [22].

In a recent survey in 52 Spanish hospitals, 4724 patients were reported to be in bariatric surgery waiting list. According to this survey, 68% of the patients were more than 6 months in WT, with a mean delay per patient of 397 days and a maximum delay of 1661 days. The WT was the only criteria for prioritization used in 50% of the centers. Different prioritization protocols were available only in 26 of the 52 hospitals surveyed, where the patient's clinical condition was more important than the date of entry in waiting list (ref. *Results SECO survey, Sevilla 2017*).

In this way, Alastrué et al. performed a review on bariatric surgery prioritization risk scales [23]. The most applicable scale was proposed by Kral JG, the Kral's Obesity Severity Index (ISO), adjusted by BMI (Table 4) [24]. However, in this scale, it is necessary to adjust the BMI score for an obesity surgery prioritization system and likewise, it does not take into account the WT, which could delay surgical intervention in patients at low risk.

Although BMI has limitations and there are other more accurate methods that determine body fat (circumference waist or waist-hip ratio, radiological techniques such as Dual Densitometry), we consider that BMI, besides being related to mortality, is the current and main parameter for indications in bariatric surgery, and it should be taken into consideration in any prioritization system.

Each BMI increase of 5 kg/m^2 above the optimum of 22.5–25 Kg/m^2 is associated with a 30% increase in overall mortality (HR 1.29, 95% CI 1.27–1.32) [8, 9]. A meta-analysis of the Global BMI Mortality Collaboration showed that overweight and obesity are associated with increased all-cause mortality on four continents. The HR for each 5 kg/m^2 units above a BMI 25 kg/m^2 was 1.39 (95% CI 1.34–1.43) in Europe, 1.29 (95% CI 1.26–1.32) in North America, 1.39 (95% CI 1.34–1.44) in East Asia, and 1.31 (95% CI 1.27–1.35) in Australia and New Zealand. This finding supports strategies to combat obesity in different populations [7].

With respect to obesity-related comorbidity, a study of the University of Alberta, Royal Alexandra Hospital (Edmonton, Alta, Canada) in 99 patients glimpses the importance of prioritizing obese patients in bariatric surgery, concluding that most patients should be prioritized based on clinical severity and functional impairment rather than the traditional approach to following the order of inclusion in waiting list [25].

Likewise, different medical classification systems have been developed to predict morbimortality in cohorts of overweight/obese patients. We have reviewed the current literature in the last 10 years using Medline/PubMed and Cochrane Library related to obesity clinical staging systems and we have collected the most representative studies, being the main obesity classification systems the BMI [7–9, 27, 28], Obesity Surgery Mortality Risk (OSMR) [26], King's Obesity Staging Criteria (KOSC) [31], and Edmonton Obesity Staging System (EOSS) [25, 29, 30, 32] (Table 5). One of the most widespread is the EOSS, a medical scale which stages obese patients into five groups, based on their comorbidity and functional status (Table 6) [25, 32]. However, we propose a medical-surgical scale that allows prioritizing wait-listed patients, which takes into account simultaneously and equitably the degree of obesity severity and WT (Tables 1 and 2). Our scale simplifies the obesity severity into three categories (A/B/C), taking into consideration the BMI. Also, unlike the EOSS, we have considered the socio-labor impact derived from obesity as an independent

Table 4 Kral's Obesity Severity Index (ISO)

Items	Score
Male sex	1
Age > 40 years	1
Smoking	2
Sleep apnea syndrome	1
History of thromboembolism	1
Diabetes mellitus	1
Neck/thigh index > 0.70 (or waist/hip index)	2
Cardiomegaly	2
Uncontrollable hypertension (> 150/90 mmHg)	2
Hemoglobin > 15 g/l	1
PCO_2 > 45 mmHg	1
Hyperinsulinemia	2
IMC (kg/m^2)	1 (28–31)
	2 (32–40)
	3 (> 40)

Table 5 Main studies of different obesity classification systems to predict the morbimortality risk and the treatment choice

Study	Type (N)	Year	Staging System	Aim	Outcome
DeMaria EJ et al. [26]	Prospective (N = 2075)	2007	OSMR	To predict mortality risk in patients undergoing gastric bypass.	Mortality N (%) - Class A: 3/957 (0.31) - Class B: 19/999 (1.90) - Class C: 9/119 (7.56)
Prospective Studies Collaboration et al. [8]	Meta-analysis (57 prospective studies)	2009	BMI (kg/m^2)	Systematic review of cause-specific mortality for overweight and obesity.	Mortality HR (95% CI) - BMI 15-25: 0.79 (0.77-0.82) - BMI 25-50: 1.29 (1.27-1.32)
Emerging Risk Factors Collaboration et al. [27]	Meta-analysis (58 prospective studies)	2011	BMI (kg/m^2)	To study separate and combined associations of BMI, waist circumference and wist-to-hip ratio with risk of first-onset cardiovascular disease.	Cardiovascular Diseases HR (95% CI). Adjustment for systolic blood pressure, diabetes and lipids - With BMI: 1.07 (1.03-1.11) - With waist circumference: 1.10 (1.05-1.14) - With waist-to-hip ratio: 1.12 (1.08-1.15)
Aasheim ET et al. [28]	Retrospective (N = 144)	2011	KOSC	To identify and stratify obesity related comorbidities that can be downstaged by bariatric surgery.	Significant health improvements after surgery, with a higher proportion of patients scored in stage 0 ("normal health") within each health domain (p □□0.001 for all)
Kuk JL et al. [29]	Retrospective (N = 6224)	2011	EOSS	To predict mortality risk in obese patients.	Mortality HR (95% CI) - EOSS 0/1: 0.72 (0.56-0.93) - EOSS 2: 1.58 (0.99-2.52) - EOSS 3: 2.13 (1.48-3.05)
Padwal RS et al. [25]	Retrospective (N = 4367)	2011	EOSS	To predict mortality risk in obese patients (subgroup elegible for bariatric surgery).	Mortality HR (95% CI) Adjusted for metabolic syndrome - EOSS 0/1: Reference - EOSS 2: 1.57 (1.16-2.13) - EOSS 3: 2.69 (1.98-3.67) Adjusted for hypertriglyceridemic waist - EOSS 0/1: Reference - EOSS 2: 1.62 (1.19-2.21) - EOSS 3: 2.78 (2.07-3.74)
Flegal KM et al. [9]	Meta-analysis (97 prospective studies)	2013	BMI (kg/m^2)	Systematic review of all cause mortality for overweight and obesity.	Mortality HR (95% CI) - BMI 25-30: 0.94 (0.91-0.96) - BMI 30-35: 0.95 (0.88-1.01) - BMI > 30: 1.18 (1.12-1.25) - BMI > 35: 1.29 (1.18-1.41)
Global BMI Mortality Collaboration et al. [7]	Meta-analysis (239 prospective studies)	2016	BMI (kg/m^2)	Systematic review of all cause mortality for overweight and obesity.	Mortality HR (95% CI) - BMI 25-27.5: 1.07 (1.07-1.08) - BMI 27.5-30: 1.20 (1.18-1.22) - BMI 30-35: 1.45 (1.41-1.48) - BMI 35-40: 1.94 (1.87-2.01) - BMI 40-60: 2.76 (2.6-2.92)
Chiappetta S et al. [30]	Prospective (N = 534)	2016	EOSS	To predict postoperative outcome and 30-day mortality after metabolic surgery.	Complications N (%) - EOSS 0: 0/27 (0%) - EOSS 1: 1/62 (1.61%) - EOSS 2: 31/377 (8.22%) - EOSS 3: 15/67 (22.39%) - EOSS 4: 1/1 (100%)
Valderhaug TG et al. [31]	Retrospective (N = 2142)	2016	KOSC	Treatment choice in patients with morbid obesity (lifestyle vs bariatric surgery).	Treatment choice Lifestyle intervention N=1329 (62%) Bariatric surgery N=813 (38%) - Age (younger, p<0.001) - BMI ≥ 40 kg/m^2 (p<0.001) - < 10 year CV-risk (p=0.004) - Women physically inactive (p<0.05)

OSMR Obesity Surgery Mortality Risk, *BMI body mass index*, *KOSC King's Obesity Staging Criteria*, *EOSS Edmonton Obesity Staging System*

Table 6 Edmonton Obesity Staging System (EOSS)

Stage	Description	Management
0	No apparent obesity-related risk factors (e.g., blood pressure, serum lipids, fasting glucose, etc. within normal range), no physical symptoms, no psychopathology, no functional limitations, and/or impairment of well-being	Identification of factors contributing to increased body weight. Counseling to prevent further weight gain through lifestyle measures including healthy eating and increased physical activity
1	Presence of obesity-related subclinical risk factors (e.g., borderline hypertension, impaired fasting glucose, elevated liver enzymes, etc.), mild physical symptoms (e.g., dyspnea on moderate exertion, occasional aches and pains, fatigue, etc.), mild psychopathology, mild functional limitations, and/or mild impairment of well--being	Investigation for other (non-weight related) contributors to risk factors. More intense lifestyle interventions, including diet and exercise to prevent further weight gain. Monitoring of risk factors and health status
2	Presence of established obesity-related chronic disease (e.g., hypertension, type 2 diabetes, sleep apnea, osteoarthritis, reflux disease, polycystic ovary syndrome, anxiety disorder, etc.), moderate limitations in activities of daily living and/or well-being	Initiation of obesity treatments including considerations of all behavioral, pharmacological, and surgical treatment options. Close monitoring and management of comorbidities as indicated
3	Established end-organ damage such as myocardial infarction, heart failure, diabetic complications, incapacitating osteoarthritis, significant psychopathology, significant functional limitations, and/or impairment of well--being	More intensive obesity treatment including consideration of all behavioral, pharmacological, and surgical treatment options. Aggressive management of comorbidities as indicated
4	Severe (potentially end-stage) disabilities from obesity-related chronic diseases, severe disabling psychopathology, severe functional limitations, and/or severe impairment of well--being	Aggressive obesity management as deemed feasible. Palliative measures including pain management, occupational therapy, and psychosocial support

variable. Warkentin LM et al. have studied the predictors of HRQL in 500 severely obese patients. They concluded that the clinical impact of BMI on physical and general HRQL was small, and mental health scores were not associated with BMI [13]. Therefore, it is convenient to separate the mental and functional repercussions from other variables such as BMI or obesity-related comorbidities. In a Canadian study in which consecutively recruited patients awaiting bariatric surgery were surveyed, most patients considered greater clinical severity and functional impairments related to obesity to be important prioritization indicators for surgery [33]. With this tool, it would avoid this problem, since it prioritizes patients in a global manner.

In Spain, the Delphi study reported the direct and indirect cost of obesity in 6.9% of the overall health cost [6]. Multiple economic-health studies on the treatment of morbid obesity demonstrate that bariatric surgery is cost-effective compared to behavioral and pharmacological measures. Surgery is an important initial expense, but it involves a medium to long-term investment with significant savings in health and socio-labor expenditure [34–37].

Finally, the problem must be addressed in a multifactorial/multidisciplinary way, including actions within the scope of management at care team, organization, and political levels, as well as improvements and transparency in current health problems divulgement, primary prevention, and health education.

Limitations

- Limitations of BMI to evaluate the degree of obesity
- Difficulty of a precise definition of the comorbidities and functional limitations
- Socio-labor impact may be subjective, and physicians may have different judgments
- WT may lead to changes in the evolution of obesity-related comorbidities
- Studies are underway to corroborate in a prospective manner the sensitivity, specificity, prognosis, and utility of this score in the daily clinical practice
- It required acceptancy at the political level and medical management of hospitals

Conclusion

Currently, patients with morbid obesity face prolonged WT for their clinical multidisciplinary assessment, complementary exams, and bariatric surgery waiting list. Since the obesity severity, the WT, and its clinical consequences are associated with an increase in morbimortality, we propose a complete, homogeneous, structured, and simple prioritization system for bariatric surgery waiting list.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Informed Consent It does not apply.

Human and Animal Rights This article does not contain any studies with human participants or animals performed by any of the authors.

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