Metabolic and bariatric surgery: Selection and preoperative work-up

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Clinical Practice Guideline for the Management of Obesity in Adults in South Africa

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SOUTH AFRICAN METABOLIC MEDICINE AND SURGERY SOCIETY

KEY MESSAGES FOR HEALTHCARE PROVIDERS

- Criteria for selecting appropriate candidates for metabolic and bariatric surgery (MBS) have been established to minimise surgical complications and to maximise the benefit of these important procedures.
- The preoperative work-up should evaluate a person's medical, nutritional, mental and functional health status.
- Special attention should be given to the care of people living with type 2 diabetes (T2DM) who are considering MBS, to minimise complications from uncontrolled diabetes in the perioperative period.
- Because of the risks of postoperative complications associated with tobacco use, cessation prior to MBS is strongly advised and should be maintained lifelong.
- In people living with obesity, MBS, in combination with behavioural interventions, is an effective option for long-term weight loss and control of chronic conditions such as T2DM, hypertension, sleep apnoea and dyslipidaemia, as well as other conditions associated with increased adiposity.

KEY MESSAGES FOR PEOPLE LIVING WITH OBESITY

- Metabolic and bariatric surgery is the beginning of a lifelong journey. You should educate yourself about the necessary changes required to optimise your long-term outcomes for a healthier life.
- Before the surgical procedure you will be asked to undergo several investigations, such as blood work and cardiac or pulmonary testing, to ensure that you are ready and safe for the operation.
- If you are at high risk for obstructive sleep apnoea, you may be asked to undergo a sleep study to determine whether you have significant sleep apnoea.
- Current or recent smoking or nicotine consumption puts you at risk of complications after metabolic and bariatric surgery. Smoking cessation is strongly advised before the operation.
- You will be given a low-calorie diet 2 to 3 weeks before metabolic and bariatric surgery in order to shrink your liver size and make the operation easier.
- If you are living with diabetes, you will have to follow your blood sugars very closely and obtain instructions on how to adjust your diabetes medications while on the low-calorie diet prior to the operation.
- Because changes in the absorption of some medications may occur with certain metabolic and bariatric surgery procedures, you may be asked to change either the type or the preparation of any medications you are currently taking.

RECOMMENDATIONS

1. We suggest that a comprehensive medical and nutritional evaluation be completed and nutrient deficiencies corrected in candidates for MBS (Level 4, Grade D).[1,2]
2. We suggest screening for and treatment of obstructive sleep apnoea in people seeking MBS (Level 4, Grade D).[3,4]
3. Preoperative smoking cessation can minimise postoperative complications (Level 2a, Grade B).[5]

Selection of appropriate patients for metabolic and bariatric surgery

Extensive preparation of people living with obesity (PLWO) prior to metabolic and bariatric surgery (MBS) is required. Potential candidates for MBS undergo multidisciplinary evaluation and optimisation of their medical, mental, nutritional and functional health to assess their eligibility and safety to proceed with MBS. Further medical evaluations may include cardiac, respiratory, metabolic,[6] gastrointestinal and sleep apnoea testing. Once adequate evaluation and preparation have been undertaken, PLWO may proceed to MBS if stable. It is recommended that PLWO engage in behavioural interventions prior to MBS and maintain those behavioural changes after MBS as well.

MBS is indicated in PLWO with a body mass index (BMI, calculated as weight in kilograms divided by height in metres squared [kg/m^2]) >35 kg/m^2, regardless of the presence, absence or severity of comorbidities.[7] MBS is also recommended in PLWO with a BMI of 30 - 34.9 kg/m^2 with type 2 diabetes mellitus (T2DM) or another comorbidity or condition associated with obesity, and those who do not achieve substantial or durable weight loss or comorbidity improvement using non-surgical treatment methods. In the Asian population, the clinical thresholds of BMI should be adapted to a BMI >25 kg/m^2 as an indication of clinical obesity. Asian PLWO with a BMI >27.5 kg/m^2 should be considered for MBS.[7]

Children and adolescents living with obesity who have a BMI greater than 120% of the 95th percentile and a major comorbidity, or a BMI of more than 140% of the 95th percentile, may be considered for MBS.[8] Important comorbidities include T2DM, significant obstructive sleep apnoea with an apnoea-hypopnoea index measured at 15 or higher, pseudotumor cerebri, or metabolic dysfunction-associated steatotic liver disease (MASLD).[7,8]

General considerations for metabolic and bariatric surgery candidates

All PLWO must be committed to engaging in the educational process involved in preparing for MBS as well as adhering to the necessary long-term follow-up, from both nutritional and medical perspectives. Appropriate surveillance and treatment of potential long-term nutritional deficiencies as well as assessment and intervention for their obesity-related complications and mental health are crucial for long-term success.

PLWO with unstable psychiatric illness, malignancy or other diseases associated with decreased life expectancy, substance abuse, or inability to adhere to long-term follow-up may be considered inappropriate candidates for MBS owing to a high risk of short- and long-term complications.

Advanced patient age is not a contraindication to MBS. The outcomes and complication rates for PLWO over 60 years of age appear to be comparable to those of a younger population, regardless of the surgical procedure performed.[9] Frailty rather than age should guide the surgeon regarding the appropriateness of considering MBS in PLWO.[7]

MASLD is common in PLWO and can lead to liver cirrhosis. The risk of MBS in PLWO carefully selected with Child-Pugh class A liver cirrhosis is not prohibitive, but caution and additional surveillance are necessary, as their overall risk for perioperative complications and mortality is increased.[10,11] In addition, MASLD is the third most common indication for liver transplantation and, with its rising incidence, is becoming an increasingly frequent cause.[12-14]

The morbidity and mortality rate of MBS before or after liver transplantation is increased, but remains acceptable in tertiary care centres.[15]

Predictors of successful postoperative weight loss

Behavioural changes

Exercise in conjunction with obesity management programmes has been demonstrated to improve weight loss and body composition. Thirty minutes per day (150 minutes per week) of moderate-intensity exercise after MBS is associated with a 3.6 kg additional weight loss compared with PLWO who do not exercise after MBS.[16]

In preparation for MBS, PLWO may benefit from implementing health behaviour change interventions. Interventions include extensive education on nutrition and the need for exercise, and behavioural strategies for successful weight loss and weight maintenance, exploring topics such as self-monitoring, mindless eating and goal setting. However, PLWO subjected to a behavioural intervention programme for 6 months prior to MBS experienced no significant difference in the degree of their weight loss at 24 months after surgery compared with controls.[17]

Preoperative weight loss

Weight reduction is associated with improvement of cardiac risk factors and the associated complications of obesity. As little as 5 - 10% weight loss can improve cardiovascular risk factors and reduce complications such as hypertension, hyperlipidaemia, T2DM, visceral fat and hepatic steatosis, as well as liver volume. High-protein diets produce rapid weight loss, provide adequate satiety, reduce lean body mass loss and decrease reduction in resting energy expenditure.[18] There does not appear to be any compromise in immune function or any effect on wound healing with the use of high-protein diets.

Preoperative psychosocial characteristics and eating behaviours, as well as poor adherence to the recommended postoperative nutrition plan after MBS, are poor predictors of postoperative weight loss outcomes, and evidence is mixed.[19] Past weight management attempts preoperatively may reflect a patient's ability to follow a strict medical nutrition plan and exercise programme postoperatively.[19] Failure to achieve adequate weight loss following MBS may ultimately reflect the underlying pathophysiology of obesity and our incomplete understanding of its complex mechanisms (see the chapter 'The science of obesity'), as well as the persistent challenge of identifying the most suitable candidates for surgery given our lack of suitable upfront predictors. However, preoperative weight loss may decrease the difficulty of performing MBS, minimise blood loss, and improve short-term weight loss and short-term complications, as well as decrease operative time.[20-22]

PLWO who achieved 5% or more excess body weight loss preoperatively experienced more substantial weight loss at 1 year compared with those with less preoperative weight loss.[23] However, longer-term studies reviewing preoperative weight loss outcomes did not confer any advantage at 4 years with regard to weight loss outcomes.[24]

Overall, there is no compelling evidence mandating weight loss prior to MBS for the long-term efficacy of weight management, but rather only for the technical simplicity of the MBS.[19]

Pre-surgical medical nutrition therapy

Many preoperative protocols include the use of a liquid-based, low-calorie diet for 2 to 3 weeks prior to MBS.[25] The International Federation for the Surgery of Obesity and Metabolic Disorders advises either a very low-calorie diet (VLCD) of 450 - 800 kcal/day or a low-calorie diet (LCD) of 800 - 1 500 kcal/day in the form of commercial liquid meal replacements either alone or in combination with food-based meals.[26] However, MBS teams can prescribe a set diet or individualised eating plan appropriate for the PLWO in their unit. These can include homemade soups, smoothies and soft foods. It is not essential that the preoperative diet is in liquid form.[27]

An LCD that is low in carbohydrates may cause a reduction in liver volume by up to 19% and a 17% reduction in visceral adipose tissue.[25,28]

The effect of preoperative weight management also provides additional motivation to the PLWO in preparation for MBS. However, adherence and compliance with preoperative meal supplements may be poor, and occasionally they are not well tolerated. In addition, commercially available meal supplements may be expensive. Preoperative weight loss with a 2-week VLCD may approach approximately 6 kg.[29]

A systematic review found that VLCDs are effective in reducing body weight and hepatic volume prior to surgery. These diets do not reduce intraoperative or post-surgical risks.[25] They do result in surgeons' perception that the difficulty of performing the operation is decreased.[20]

Preoperative PLWO taking a VLCD using Optifast 800 kcal per day for 2 weeks prior to MBS were compared with PLWO on a normal diet without any caloric restriction.[20] There was a non-significant difference in the operating time, but there was a higher surgeon-perceived scale of difficulty in control PLWO compared with PLWO who received a VLCD prior to MBS. The 30-day complication rate was higher in control PLWO, including wound gastrointestinal and deep haemorrhage, infection, dehiscence and anastomotic leak.[20] In two other studies, preoperative weight loss of ≥8% excess weight in PLWO following a VLCD for 4 weeks prior to MBS was associated with decreased hospital length of stay and greater 3-month and 1-year postoperative weight loss compared with those who did not follow a VLCD.[21,30] Neither the major complication rate nor conversion rates were affected by the degree of preoperative weight loss.[21]

Risk assessment prior to bariatric surgery

Nutritional evaluation

Limited high-quality evidence has reviewed preoperative malnutrition status in PLWO seeking MBS. Nonetheless, observational studies have indicated that PLWO have a higher risk for inadequate nutritional status[2,31-33] and malnutrition.[31,34,35] Preoperative evaluation and collaborative support from a registered dietitian are recommended for all PLWO considering MBS.[2,36]

A large, multi-centre retrospective observational study (*N*=106 577) found that approximately 6% of PLWO undergoing MBS were malnourished (hypoalbuminaemia) and had increased risk of death or serious morbidity (DSM) and 30-day readmission rates.[34] This study also found that over 10% weight loss prior to MBS was associated with nine times higher rates of DSM in PLWO with mild malnutrition, and 10 times higher DSM in those with severe malnutrition.[34] Similarly, a retrospective cohort study concluded that 32% of the PLWO cohort (*N*=533) had malnutrition prior to MBS.[35] Higher BMI was associated with increased risk for malnutrition, and postoperative nausea and vomiting were associated with preoperative malnutrition.[35]

The prevalence of preoperative micronutrient deficiencies is also high in PLWO.[37] Preoperative laboratory work should include a full blood count, creatinine, iron panel, vitamin D, calcium, albumin and vitamin B_{12}. Fasting plasma glucose, glycated haemoglobin (HbA1c), a lipid panel and liver enzymes can also be measured at the same time, as part of the evaluation of obesity-related metabolic complications. Vitamin A, parathyroid hormone, phosphate, zinc, selenium and copper levels can be assessed more selectively, owing to cost considerations. Preoperative optimisation of micronutrient levels prior to surgery, specifically levels of vitamin D, vitamin B_{12} and iron, is recommended.[2] A recent study in a South African (SA) population has shown a high prevalence of vitamin D, iron and folate deficiency in PLWO scheduled for MBS. These micronutrients should be assessed and deficiencies treated as part of the minimum requirement, in a resource-constrained environment.[38] A preoperative multivitamin complex with vitamin B_1 is usually started at least 1 month prior to surgery. Of note, PLWO taking proton pump inhibitors and/or metformin have an increased prevalence of vitamin B_{12} deficiency.[2]

Smoking and nicotine use

Smoking and nicotine cessation should be recommended for all PLWO undergoing MBS. Surgical centres recommend that smoking cessation should be achieved for at least 6 weeks up to 6 months prior to MBS to ensure adequate extinction of consumption.[39]

Nicotine contributes to ulcer development by potentiating acid and pepsin secretion, increases bile salt reflux, increases *Helicobacter pylori* infection risk, and diminishes prostaglandin synthesis, mucosal blood flow and gastric mucus.[40]

Cigarette smoking may be associated with an increased risk of marginal/stomal ulceration in PLWO undergoing gastrojejunal anastomoses as part of their MBS procedure and may increase the risk of stricture formation. On average, complications related to smoking exposure may occur postoperatively around 14 months.[41]

Smoking after MBS may also be associated with pneumonia and postoperative complications with subsequent surgeries involving body contour surgery and mastopexy.[5,42-46]

Mental health assessments

A preoperative psychosocial assessment by a healthcare provider (HCP) with expertise in MBS and mental healthcare is recommended.[36,47] See the chapter 'The role of mental health in obesity management' on what such an assessment should entail, as well as the effects of mental health diagnoses on post-surgical outcomes.

Preoperative investigations

The preoperative evaluation of an MBS candidate is similar to that of people considered for surgery of comparable risk, with some caveats. MBS candidates may have additional factors that may make their clinical evaluation more challenging. Many patients referred for MBS may have low or exceptionally low functional capacity.

Cardiac evaluation

Exercise tolerance is a predictor for surgical outcomes; symptom-limited stair climbing, for example, is predictive of postoperative cardiopulmonary complications in patients undergoing high-risk MBS.[48] In addition, obesity is an independent risk factor for cardiovascular disease. Many PLWO may also show symptoms of shortness of breath or chest pain, and the aetiology of these symptoms may be varied. Furthermore, physical examination in PLWO may be challenging in that physical findings such as distant heart sounds or the jugular venous pressure may be difficult to obtain.

PLWO undergoing MBS may have abnormalities in their electrocardiogram (ECG). An abnormal ECG in PLWO undergoing MBS may be independently associated with an increased likelihood of a complicated postoperative course, including the need for postoperative intensive care unit (ICU) admission.[49] Obesity may also be associated with changes in cardiac morphology, including left ventricular hypertrophy, diastolic dysfunction or left ventricular dysfunction. MBS is associated with a decrease in left ventricular mass index and left ventricular end-diastolic volume, and improvement in diastolic and systolic function and left atrial diameter.[50]

Cardiac echocardiography is not typically performed during preoperative evaluations, but may be required to detect suspected left or right ventricular dysfunction, valvular heart disease or pulmonary hypertension. The visualisation of echocardiographic images is often suboptimal, and echocardiographic contrast agents improve the ability to identify endocardial borders and assess ventricular wall motion abnormalities. A radionuclide angiography multigated acquisition scan may also be helpful in the assessment of ejection fraction. Cardiac nuclear stress testing may be required to investigate chest pain. In patients with a BMI over 30 kg/m^2, an abnormal nuclear stress test was associated with increased annual rates of cardiac events, cardiac death or death from any cause.[51] Computed tomographic coronary angiography may be difficult with increased body habitus owing to depth-dependent spatial resolution. In addition, computed tomography scanner tables may be limited by weight restriction. The gold standard for cardiac evaluation remains coronary angiography, which was not associated with an increase in minor or major complication rates from the procedure in PLWO.[52]

Pulmonary evaluation

The respiratory system is also significantly affected in PLWO. Impairment in pulmonary function due to restriction in lung volumes and abnormalities in respiratory mechanics resulting in increased work of breathing may detrimentally affect the respiratory status of MBS candidates.[53,54]

Sleep apnoea

It is not uncommon for PLWO to experience sleep-related disorders, which may result in significant respiratory, cardiovascular and neuropsychiatric conditions.[55] Obstructive sleep apnoea, one type of sleep-related disorder, is either complete cessation of airflow (apnoea) or significant reduction of airflow (hypopnoea) measured during sleep. The presence of obstructive sleep apnoea has been associated with premature death,[56,57] motor vehicle accidents,[58] hypertension,[59] coronary artery disease and cerebrovascular accidents,[60] nocturnal cardiac arrhythmias[61] and T2DM.[62] In addition, obstructive sleep apnoea has been associated with a significant increase in the incidence of sudden death from all cardiac causes.[56] Obstructive sleep apnoea has been demonstrated to affect the white matter within the limbic system, pons, frontal, temporal and parietal cortices, and projections connecting the cerebellum, which are key areas for brain function and memory.[63]

The incidence of obstructive sleep apnoea in middle-aged adults in the Wisconsin Sleep Cohort Study was approximately 24% in males and 9% in females.[64] In patients undergoing MBS the prevalence of obstructive sleep apnoea can be 90% or more, with clinically significant sleep apnoea underdiagnosed in as many as 50% of these patients.[3,4] The prevalence of obstructive sleep apnoea is much higher in male compared with female MBS candidates.[65] The diagnosis of obstructive sleep apnoea is particularly challenging because there may be no correlation between the severity of obstructive sleep apnoea and BMI.[66]

MBS results in improvement or resolution of a patient's obstructive sleep apnoea.[67] Obstructive sleep apnoea in PLWO is believed to be caused by excess fat deposition in or around the neck, causing the patient's upper airway passages to collapse.[68] PLWO undergoing MBS who have obstructive sleep apnoea may have an increased complication rate, which may include a prolonged hospital stay, the occurrence of thromboembolic phenomena, the need for reintervention, and an increased 30-day mortality rate.[69] In addition, the presence of obstructive sleep apnoea may be associated with more challenging intubations and increased ICU admissions.[70,71]

The gold standard in the diagnosis of obstructive sleep apnoea is a level 1 polysomnogram (PSG).[72] Resources for overnight in-laboratory PSG testing can be limited and expensive.[73] As a result, alternative methods for identifying PLWO at risk for obstructive sleep apnoea have been established. Use of screening questionnaires, including the STOP-Bang Questionnaire, Berlin Questionnaire and Epworth Sleepiness Scale, has become routine for PLWO undergoing MBS. To identify clinically significant obstructive sleep apnoea, relying on subjective screening questionnaires may fail to identify people at risk.[4,74]

The STOP-Bang or Berlin questionnaires may not be effective tools for detecting a moderate or high risk of obstructive sleep apnoea in PLWO undergoing MBS, so more effective tools should be considered or developed.[4] There may also be no significant correlation between the Epworth Sleepiness Scale and severity of obstructive sleep apnoea.[75] There should be a high clinical suspicion for the presence of obstructive sleep apnoea in PLWO undergoing MBS. While some advocate that all PLWO should be subjected to formal PSG, such resources are limited and costly.[66] The South African Society for Sleep and Health recommends a type 3 apnoea screening test, using a technically adequate home-based device, to diagnose sleep apnoea.[76] Importantly, some MBS units in SA may have limitations performing even home-based PSGs owing to cost constraints. The use of continuous pulse oximetry postoperatively is a safe alternative in MBS candidates who are unable to do preoperative testing for obstructive sleep apnoea.[77] In PLWO with other respiratory disorders, other more complex medical conditions or a failed home screening test, a formal PSG is recommended.[76] In addition, the use of continuous positive airway pressure (CPAP) immediately postoperatively after gastric bypass is safe, and it should be administered if deemed clinically indicated.[78] If PLWO are already on a CPAP machine, it is important to check adherence to management. A repeat sleep study is indicated in cases where patients have severe sleep apnoea and adherence to treatment is poor.[79]

MBS is beneficial in improving obstructive sleep apnoea.[80] However, despite significant weight loss postoperatively, moderate to severe obstructive sleep apnoea may persist at 1 year postoperatively in 20% of cases. In the majority of cases we see a significant improvement in obstructive sleep apnoea.[81]

The long-term relationship between weight loss and sleep apnoea is complex. There should be hypervigilance for recurrence of obstructive sleep apnoea in PLWO previously diagnosed with obstructive sleep apnoea, as recurrence can occur in the absence of weight regain.[82,83]

Endoscopy

A recent systematic review by Brown *et al.*[84] found that there were abnormal endoscopic findings in 55.5% of PLWO prior to MBS. The consideration for performing endoscopy should not be individualised based on symptoms, risk factors and type of procedure being considered – endoscopy should be offered to all PLWO considering MBS.[84,85] PLWO considering sleeve gastrectomy who have dyspepsia, reflux, dysphagia or symptoms suggestive of foregut pathology, as well as those on chronic anti-acid therapy, should undergo preoperative endoscopy to rule out the presence of hiatal hernia, oesophagitis or Barrett's oesophagus, or other diseases such as peptic ulcer disease and tumours.[86-90] Screening for *H. pylori* can be performed at the time of endoscopy. The incidence of *H. pylori* in PLWO planning to undergo MBS is variable, ranging between 15% and 85%.[90,91] *H. pylori* may be implicated in the development of gastritis, peptic ulcer and gastric carcinoma.[92,93] Screening for *H. pylori* is recommended for this reason in PLWO undergoing Roux-en-Y gastric bypass (RYGB). Screening investigations for malignancy should also be considered prior to MBS owing to the association between certain malignancies and obesity. This may include screening colonoscopy for malignancy in patients 50 years of age and over, and mammography and Pap smears in appropriate candidates.[94-96]

Risk of thromboembolism

The 90-day incidence of venous thromboembolism after MBS is 0.42%. Although uncommon, the clinical consequences can be devastating. Up to 40% of perioperative deaths may be attributed to pulmonary embolism. It remains one of the most common causes of perioperative death along with myocardial infarction and sepsis from anastomotic leak.[97] Prophylaxis with low-molecular-weight heparin to prevent thromboembolism postoperatively after RYGB is common practice. The prophylactic use of an inferior vena cava filter is no longer recommended, even in PLWO at high risk of pulmonary embolism, as it is associated with increased risk of postoperative deep-vein thrombosis and overall mortality without decreasing the risk of pulmonary embolism.[98]

Other considerations

PLWO are at increased risk for several gastrointestinal, hepatobiliary and intra-abdominal processes. Evaluation of the MBS patient with abdominal ultrasound is not routinely recommended, except in those PLWO requiring investigation for symptomatic biliary disease and elevated liver enzymes or MASLD.[99]

Following MBS, decreases in bone density may be observed due to bone loss. Mixed restrictive and malabsorptive procedures, such as RYGB and single anastomosis duodenal-ileal bypass with sleeve gastrectomy, increase risk for bone fractures. Sleeve gastrectomy may result in bone loss to a lesser degree. Bone loss after MBS may be attributed to many factors, including nutritional factors, skeletal unfolding, calciotropic hormone abnormalities, body and bone marrow fat changes, and changes in gut hormones. Baseline bone density evaluation may be considered before and 2 years after MBS depending on risk factors, which include postmenopausal women, older men, PLWO with prior fragility fractures, or a family history of osteoporosis. Vitamin D and parathyroid hormone levels may be obtained preoperatively in the screening for PLWO at risk for metabolic bone disease.[100]

Medication considerations

Prior to MBS, PLWO need to receive instructions and general precautions surrounding their medications. Avoidance of aspirin may be required prior to MBS in PLWO taking it for primary prevention. In addition, anti-inflammatory agents must be discontinued prior to MBS. The use of these agents postoperatively will depend on their indication, risk tolerance and the surgical procedure. Chronic use of non-steroidal anti-inflammatory drugs is contraindicated after RYGB, owing to the risk of anastomotic ulcer. Antiplatelet and anticoagulant medication will also require cessation prior to surgery. In some cases, bridging anticoagulation may be necessary. The use of direct oral anticoagulants of which absorption is not dependent on low pH conditions may be considered for anticoagulation after sleeve gastrectomy. The efficacy of direct oral anticoagulants after RYGB is uncertain, so vitamin K antagonists such as warfarin remain the preferred oral agent for anticoagulation.[101] PLWO should be made aware of the need to switch to vitamin K antagonists after RYGB.

Immune-modulating medications used in the treatment of connective tissue and inflammatory disorders, skin disorders and immune-mediated gastrointestinal diseases may need to be held prior to MBS as well as postoperatively for a period of time, at the discretion of the prescribing HCP.

Long-acting release medications may need to be converted to short-acting preparations after MBS. Medications dependent upon absorption or an acid environment in the stomach and upper gastrointestinal tract may need to be re-evaluated as well.[102-104] Certain medications may need to be crushed, while encapsulated formulations may need to be opened in the early postoperative period. A comprehensive pharmacological consultation prior to MBS should be considered.

Women taking oestrogen therapy in the form of oral contraception should discontinue their medication 4 weeks prior to MBS, while postmenopausal women may discontinue hormone replacement therapy 3 weeks prior to MBS.[36,69]

Perioperative use of glucagon-like peptide-1 agonists

Glucagon-like peptide-1 (GLP-1) receptor agonists (RAs) can be used safely in the perioperative period, provided they are prescribed and monitored in the setting of a multidisciplinary team. The risk of perioperative aspiration is higher during the escalation phase, in PLWO on higher dosages and in PLWO on a weekly dose compared with a daily dose. PLWO should also be evaluated for other medical conditions that can lead to decreased gastric emptying, such as gastroparesis in people living with diabetes (PLWD), gastric dysmotility, and Parkinson's disease. Perioperative management of these PLWO should include steps to minimise the risk of aspiration. PLWO on GLP-1 RAs who receive a daily dose should stop the GLP-1 on the day prior to surgery. PLWO on a weekly dose should stop medication a week prior to surgery, because of the longer half-life.[105]

Preoperative management of people living with diabetes

In preparation for MBS, blood glucose readings of PLWD should be optimised. Re-evaluation of their comprehensive care plan should be undertaken, as well as re-evaluation of their dietary intake and activity level and the status of other pharmacotherapy. Existing guidelines recommend targets for diabetic glycaemic control with the hope of improving MBS outcomes. Suggested targets include an HbA1c level <7%, with overall readings on a sensor (if available) in the range of 4 - 10 mmol/L 70% of the time.[106] Finger-prick equivalents would be a fasting glucose level <6 mmol/L and 2-hour postprandial readings <10 mmol/L. However, there are limited data guiding the management of glycaemic control in MBS preoperatively, and this may therefore need to be individualised. With other surgeries, such as orthopaedic and colorectal surgery, elevated HbA1c preoperatively may be associated with prolonged length of stay postoperatively and worsened postoperative outcomes.[107-111]

Elevated blood sugars prior to MBS may be associated with increased postoperative complications, decreased weight loss and less resolution of the glucose levels.[112]

Randomised controlled trials suggest that neither intensive management of PLWDs' glycaemic control 3 months prior to RYGB nor intensive control of glycaemia in the first 2 weeks postoperatively resulted in better HbA1c levels 1 year after surgery.[113]

Less aggressive blood glucose targets may be required prior to MBS, as PLWD often have high insulin resistance, resulting in suboptimal control.[114] While PLWD are on a controlled VLCD in preparation for MBS, re-evaluation of their diabetic medications should be undertaken, as their requirements for medication to control blood sugars may be significantly altered.

Avoiding sulphonylureas while PLWD are on a VLCD should be considered to avoid hypoglycaemia. In addition, sodium-glucose co-transporter-2 inhibitors should be stopped while on a VLCD owing to the risk of diabetic ketoacidosis.[115] Alpha-glucosidase, alpha-amylase enzyme inhibitors and thiazolidinediones may be stopped during this time. In addition, dipeptidyl peptidase-4 inhibitors and GLP-1 Ras may also be held, especially with adequate blood sugar control.

Insulin requirements while on meal replacement therapy in preparation for MBS drop dramatically. Intermediate- and long-acting insulins require a decreased dose, often by 50%, and short-acting insulins require significant readjustment as well.[116,117] Frequent blood sugar monitoring is required while on VLCDs in preparation for MBS. Symptomatic hypoglycaemia is treated in the usual fashion.[118]

While a patient is on meal replacement therapy, there may be an increased risk of intravascular volume depletion. Close observation of volume status, electrolytes and kidney function is a prudent and cautious approach.[119] Diuretics should be dose adjusted or held. In addition, close evaluation of blood pressure readings is required, and adjustment to antihypertensive medication may be necessary.[120] PLWO with hypertension on blood pressure medication and concurrent meal replacement therapy should be educated about the possibility of developing orthostatic hypotension.

PLWO on meal replacement therapy and warfarin may also require closer observation of their international normalised ratio. [121,122]

Conclusion

MBS is a life-altering and effective obesity management intervention. Several considerations are necessary to prepare PLWO for MBS. The PLWO's medical, mental, nutritional and functional health should be evaluated prior to surgery. Once adequate evaluation, preparation and optimisation have been undertaken, establishing an acceptable perioperative risk profile, the PLWO may proceed with MBS.

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