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Ethical aspects of Bariatric Surgery in adolescents

Aspectos éticos de la Cirugía Bariátrica en adolescentes

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Abstract:

Obesity in adolescents is a global health challenge, its prevalence is increasing worldwide. Importantly, being overweight and obese are linked to a higher risk of death compared to being underweight. The objective of the present narrative review was to discuss the main ethical challenges (autonomy, beneficence, non-maleficence, justice) and implications of bariatric surgery in adolescence. The surgical treatment of morbid obesity in adolescents is a therapeutic modality that can be considered in a selected group of adolescents with severe obesity, who meet the requirements and recommendations, with the aim of improving their quality of life, reducing metabolic risks, associated diseases and early mortality. Bariatric surgery should not be indicated as an isolated procedure, but rather should be associated with a set of interventions aimed at strengthening permanent changes in lifestyle.

Keywords:

Obesity, adolescents, bariatric surgery, ethics.

Resumen:

La obesidad en adolescentes es un desafío global para la salud, su prevalencia está en aumento a nivel mundial. Es importante destacar que el sobrepeso y la obesidad están relacionados con un mayor riesgo de muerte en comparación con el bajo peso. El objetivo de la presente revisión narrativa fue discutir los principales desafíos éticos (autonomía, beneficencia, no maleficencia, justicia) y las implicaciones de la cirugía bariátrica en la adolescencia. El tratamiento quirúrgico de la obesidad mórbida en el adolescente, es una modalidad terapéutica que puede ser considerada en un grupo seleccionado de adolescentes con obesidad severa, que cumplan con los requisitos y recomendaciones, con el objetivo de mejorar su calidad de vida, reducir riesgos metabólicos, enfermedades asociadas y mortalidad temprana. La cirugía bariátrica no debe indicarse como un procedimiento aislado, sino debe estar asociada a un conjunto de intervenciones orientadas a fortalecer cambios permanentes en el estilo de vida.

Palabras Clave:

Obesidad, adolescentes, cirugía bariátrica, ética.

INTRODUCTION

Obesity in adolescents is a global health challenge, the prevalence is increasing worldwide[1]; there is a high probability that obesity during adolescence persists into adulthood[2], which is related to the presence of cardiovascular, metabolic and psychosocial diseases, also increased the risk of premature mortality.[3] In turn, overweight and obesity are linked to a higher risk of death compared to underweight.[4] Data from the World Health Organization (WHO) estimated in 2016 more than 340 million children and adolescents between 5 and 19 years old were overweight or obese[1], this increase has occurred similarly in both boys and girls, with 18% of girls and 19% of boys being overweight.[4] The primary approach to the treatment of obesity and metabolic syndrome in adolescents focuses on diet, exercise, and behavioral changes[5-6], however, these approaches have been found to have moderate to low effects in patients with the highest degrees of obesity.[7] Furthermore, approved pharmacological treatments for obesity in adolescents are limited[8], currently, only two drugs have been approved by the Food and Drug Administration (FDA) for use in youths patients: sibutramine and orlistat[9], the most frequently observed adverse effects are vasoconstriction, increase in blood pressure, constipation, tachycardia, insomnia, dizziness, anxiety, depression,

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constipation and headache.[9] In the field of adolescent obesity treatment, Bariatric Surgery (BS) has gained increasing attention as a viable option; it is especially considered for adolescents with severe obesity who have not responded to conservative treatments (single component treatment).[10] The possibility of performing BS in this age group appears as a result of the good results in adults; however, surgical intervention in adolescents raises peculiar aspects (reduction in BMI and improvement or resolution of associated comorbid conditions, especially type II diabetes mellitus).[11] The question arises as to whether BS should be considered as a treatment for severe obesity in this population. The intention of BS is to minimize health problems, but it is necessary to consider that there is insufficient data on the safety, evolution and cost-benefit relationship of the procedure in adolescents.[12] Additionally, lack of physical and emotional maturity at this stage of life can create challenges related to autonomy and decision making.

MAIN SURGICAL PROCEDURES OF BARIATRIC SURGERY

Gastric Bypass (gastroplasty with Roux-en-Y intestinal bypass)

It is the most used technique, due to its safety and effectiveness, the patient can lose 40% or more of excess weight. This technique consists of reducing the deviation of the stomach and intestine, to promote the increase of hormones that give the feeling of satiety and reduce hunger. Consequently, lower intake and increased satiety cause the patient to lose weight, and in addition to controlling diabetes and other diseases associated with obesity.[13]

Adjustable gastric band

It promotes hormonal changes, but is quite safe and effective in reducing weight (20% to 30% overweight), and can help in the treatment of type II diabetes. It is the installation of an adjustable silicone band around the stomach that, by squeezing the organ, makes it possible to control gastric emptying.[13,14]

Gastric sleeve

The stomach is reduced, leaving it with an approximate capacity of 80 ml to 100 ml, the weight loss is similar to gastric bypass and greater than that of the adjustable elastic band. The procedure is relatively new and offers good results in controlling blood pressure, cholesterol, triglycerides and some diseases associated with obesity.[13]

Duodenal junction

Here, 85% of the stomach is removed, but the basic physiology of the stomach and its emptying are maintained, weight loss is much greater, and one of the reasons is reduced nutrient absorption; weight loss is approximately 40% to 50%.[13]

The WHO concluded that the gastric band is the most common procedure for the treatment of obesity in adolescents, because it is less invasive.[15] However, with the review of these studies[13], the evidence for BS in these age groups is still insufficient, especially with respect to long-term results (>10 years).[13] The gastric bypass (gastroplasty with Roux-en-Y intestinal bypass) is considered effective in treating obesity-related health problems in adolescents.[16] To obtain the best results, a multidisciplinary team of pediatric specialists is necessary for preoperative and postoperative decision making[17], according to the guidelines of the pediatric committee of the American Society for Metabolic and Bariatric Surgery (ASMBS)[18], suggest a team multidisciplinary consisting of: a BS with experience in adolescents, a pediatrician specialized in nutrition, a nutritionist with experience in the treatment of pediatric obesity and working with families, a psychologist and/or psychiatrist with training in pediatrics/adolescence and experience in the treatment of obesity and eating disorders and a kinesiologist or exercise physiologist.[19] BS has been associated with effective and sustained weight loss, resolution of comorbidities and an improvement in quality of life.[20] However, its use in adolescent patients is still limited; this is in part, to ethical concerns related to performing an irreversible and invasive procedure in adolescence, with possible lifelong implications.[13] It is important to keep in mind that adolescents can be a vulnerable population for decision-making[21], where their freedom and autonomy must be considered. Additionally, many of them suffer from body dissatisfaction, low self-esteem, and mood disorders, which adds to a possible history of eating disorder symptoms[22], these factors can have a significant impact on the decision to undergo BS and in the results obtained. It is important to mention that the results of the long-term psychosocial consequences of BS in adolescents are limited and require specific attention and competencies.[23] It is relevant to mention that, although there are general clinical guidelines to determine eligibility for bariatric surgery[24,25], a standardized protocol for screening evaluations has not yet been developed.[26] This is surprising because the importance of a thorough psychosocial evaluation before intervention and the ethical dilemmas this type of procedure raises.[27] The objective of the present narrative review was to discuss the main ethical challenges (autonomy, beneficence, non-maleficence, justice) in carrying out CB in adolescence, however it is necessary to mention the importance of declaration of Helsinki, the Belmont declaration, the Nuremberg code, which are documents and guidelines that we have to take into account for the protection of research in participants and the promotion of ethical practices.

ETHICAL ASPECTS OF BARIATRIC SURGERY

Autonomy

The ethical principle of autonomy refers to respect for the rights of each person to make their own decisions. In the field of clinical research, the principle of autonomy is specified by obtaining informed, comprehensive, competent and voluntary consent from the person who is going to participate in a treatment.[28] In the context of BS in adolescents, autonomy plays

an important role, according to Moreira[29], adolescents are a developing population, and their ability to make informed decisions and exercise autonomy may be limited compared to adults. The decision to undergo BS is complex and carries long-term implications in terms of lifestyle, health and emotional well-being. Health professionals should carefully evaluate adolescents decision-making capacity and consider their emotional maturity, understanding capacity, family support, and psychosocial support before recommending BS.[27] It is essential to ensure that adolescents are adequately informed about the risks, benefits and alternatives of the procedure, and that they feel empowered to actively participate in the decision-making process.[30] In some cases, it is necessary to involve parents or legal guardians in decision making, especially if the adolescent does not have full understanding or if there are concerns about his or her ability to follow postoperative recommendations.[31] The goal is to find a balance between respecting the adolescent's autonomy and ensuring their long-term well-being and safety.[32] The approach to autonomy in BS in adolescents must be individualized and multidisciplinary, involving health professionals, psychologists, social workers and other specialists[30], in order to guarantee a complete evaluation and provide the necessary support both before and after the procedure.

Beneficence

The beneficence refers to the ethical principle that involves acting for the benefit of others and seeking the well-being and improvement of their situation.[29] In the context of BS, it is related to the goal of improving the health and well-being of young patients suffering from severe obesity. BS is considered a treatment option for adolescents with severe obesity.[33] The main objective of BS in this group of patients is to achieve significant weight loss, improve associated comorbidities and promote a better quality of life.[34] The surgery can offer important benefits for adolescents with severe obesity, as it can help reduce the risk of cardiovascular disease, type 2 diabetes, and other obesity-related health problems.[26] In addition to weight loss, BS can have positive effects on metabolic health, glucose control, blood pressure, and overall quality of life.[35] However, it is important to note that beneficence must be balanced with other ethical aspects, such as respect for autonomy and justice. The decision to have a child or adolescent undergo BS should be based on a comprehensive evaluation that considers potential benefits, risks, ability to understand, and ability to follow postoperative recommendations.[19] It is also crucial to have a multidisciplinary team that provides adequate support before, during and after the procedure.[29,35] Currently, the treatment of this condition is multidisciplinary, including exercise, behavioral therapy and dietary changes[20], if the treatment provides real benefits, all patients who need it should have easy access[36], which does not happen in practice, the biggest bioethical problem is the lack of allocation of resources for the procedure.

Non-maleficence

Non-maleficence is an ethical principle that refers to the obligation not to cause harm to others or to minimize any possible harm.[37] In the context of bariatric, non-maleficence involves avoiding or minimizing the risks and potential negative consequences associated with the surgical procedure.[36] BS is an invasive and complex treatment used for severe obesity in adolescents who have not responded to other, more usual treatment approaches.[26] Although it can offer significant benefits, such as weight reduction and improvement in associated comorbidities, it also carries certain risks and possible complications, studies such as Beamish[27], mention that not all adolescents seem too much benefit from bariatric surgery and we still cannot reliably identify those who will obtain the greatest benefit, which is why we must analyze all the consequences in order to minimize the risk of nutritional deficiencies and possible associated complications. For adolescents, there are additional considerations due to their stage of development and growth, BS can affect bone development, nutrient absorption and hormonal balance in this growing population.[33]Additionally, emotional and psychological challenges may arise related to physical changes and lifestyle adjustments after surgery.[38] Therefore, non-maleficence in relation to BS in adolescents implies that healthcare professionals must carefully evaluate the potential risks and benefits of the procedure in each individual case. They should consider the young patient's maturity, ability to understand, and ability to adhere to postoperative recommendations, and should take all necessary precautions to minimize risks and ensure patient safety.[39] It is essential that the medical and multidisciplinary team provide comprehensive care, including psychological and social evaluations, education on lifestyle changes, and appropriate follow-up to ensure the long-term safety and well-being of adolescents undergoing BS.[34] Ethical decision-making in this context must consider both potential benefits and risks to ensure that the principle of non-maleficence is respected.[30] Studies with a larger number of patients are necessary to identify factors associated with weight loss, changes in the metabolic profile and changes in body composition, good adherence to pre- and postoperative indications would be a determining factor for adequate weight loss, better metabolic results, and prevention of nutritional deficiencies in adolescents[40], however, predictive factors for better adherence have not been clearly identified.[41] Regarding quality of life, studies of up to 5 years of follow-up[42,43], show that, along with substantial and lasting weight loss, adolescents report marked and sustained improvement in weight-related quality of life, based on this review of the different clinical trials and systematic reviews, it is shown how BS, in any of its surgical modalities (Roux-en-Y gastric bypass, vertical sleeve gastrectomy or adjustable gastric band) can be efficient for the treatment of morbid obesity in adolescents, which, when compared against adults, the results in the adolescent population are more significant, in relation to a greater weight loss in the first year, which has been maintained more when evaluated in

the fifth year, and with a higher rate of resolution of metabolic and cardiovascular comorbidities.[44]

Justice

Justice is an ethical principle that refers to equity and fairness in the distribution of resources, benefits and burdens in a society.[45] In the context of BS, the principle of justice applies to the consideration of who are appropriate candidates to receive this type of treatment and how it is distributed fairly among them. BS in adolescents with severe obesity is a limited resource and is not free of risks and costs.[46] It is important that fair and equitable criteria are applied to select the right candidates and ensure that resources are available to those who need them most.[35] Determination of eligibility for BS in adolescents is generally based on the severity of obesity, the presence of comorbidities, and lack of response to other more first choice treatment approaches.[26] Health professionals must fairly and objectively evaluate potential patients, considering not only their Body Mass Index (BMI), but also their general health, their emotional maturity, and their ability to meet the requirements. postoperative recommendations.[30,33,34] In addition, justice is also related to accessibility and equal opportunity in access to BS, resources and services related to BS must be available and accessible to all people who meet the established criteria, regardless of your ethnic origin, your socioeconomic status or any other personal characteristic.[29]

INFORMED CONSENT

Written informed consent is obtained from the parents or legal guardian of all patients; depending on age, the informed assent of the adolescent must be obtained separately from the parents to avoid misunderstandings.[31] The patient's knowledge of the risks and benefits of the procedure and the importance of postoperative follow-up should be formally assessed to ensure true informed consent. The parental consent process should include a discussion of the risks of adult obesity, available medical treatments, surgical alternatives, and the specific risks and outcomes of the proposed BS.[47] The acceptance and regulation of BS in adolescents varies between countries and religion, some allow this surgery in specific cases and under certain criteria, while others may have stricter restrictions or be prohibited, policies and regulations may change over time, it is important to consult up-to-date sources or contact health professionals in each specific country to obtain the latest information.

CONSENT/ASSENT TO THE PROCEDURE

There are a series of aspects that must be included in the request for consent/assent[19,48] which must include:

1. Clear information about the diagnosis, including degree of obesity and associated comorbidities.
2. The procedures available for adolescents, including visual material that describes the procedure and allows understanding the difference between them.
3. Risks and benefits of the surgical procedure to be performed.
4. Risks and benefits of not performing surgery.
5. Behavior that must be maintained after BS to achieve weight objectives and resolution of comorbidities, emphasizing adherence to nutritional indications. Include the schedule of post-operative controls.
6. Financial aspects of the procedure and follow-up, including the cost of complications if any.
7. Expected results after carrying out the procedure

In the Table 1 describes the criteria for patient selection and contraindication in BS.

COMPLICATIONS ASSOCIATED WITH BS IN ADOLESCENTS

Surgical, medical and nutritional complications must be considered when evaluating the relevance of these procedures. Complications[16,19,49,50] associated with bariatric surgery in adolescents:

1. The surgical morbidity and mortality of BC is directly related to the experience of the surgical team and the hospital center.
2. In a 3-year follow-up, the Teen-LABSInge TH study reported major complications in 9%, which included; intestinal obstruction, leaks, sepsis and postoperative hemorrhage; minor complications reached 15%.
3. In a 5-year follow-up report after RYGB reported 1.9% mortality and 19% abdominal reinterventions, cholecystectomy represented almost half of these procedures (9.4%), followed by intestinal obstruction 2.5 % and herniorrhaphies 2.0%.
4. Late complications occurred in 10% to 15% and included hernias, cholelithiasis, intestinal obstruction, and stenosis.
5. Micronutrient deficiency (involving deficiency of calcium, vitamin D, iron, folic acid, vitamin B1, B6 and B12) secondary to restriction of food intake and malabsorption, constitutes the most important medium and long-term complication of BS, and is directly related to inadequate adherence to both dietary and supplementation indications.
6. The disturbing symptoms of dumping (postgastrectomy) and other frequent intestinal movements, particularly after eating sweets, such as nausea, vomiting and diarrhea, are recurrent in some patients undergoing Roux-en-Y gastric bypass.

LONG-TERM MONITORING

Any adolescent undergoing bariatric intervention needs long-term multidisciplinary follow-up after the intervention, morbidly obese patients often have nutritional deficiencies, particularly in fat-soluble vitamins, folic acid, and zinc.[51] However, some complications have been reported, such as bone demineralization due to vitamin D deficiency[52], or hair loss secondary to zinc deficiency.[51] Long-term problems, such as changes in bone metabolism or neurological complications, should be carefully monitored.[47]

Table 1. *Criteria for patient selection and contraindication in bariatric surgery*[19,26,47]

Criteria for patient selection in BS	Conditions that contraindicate BS
• BMI > 97th percentile (or > 40 kg/m 2) with significant comorbidities (hypertension, insulin resistance, glucose intolerance, substantial impairment in quality of life or activities of daily living, such as dyslipidemia). • Documented attempt to lose weight through diet and lifestyle intervention. • 95% skeletal maturity determined by dual-energy X-ray absorptiometry scan, and stability of psychological comorbidities. • The patient's desire to undergo surgery, appropriateness of prior weight loss attempts, and strong evidence of ability to comply with follow-up medical care, plus a demonstrated commitment to complementary lifestyle change and a stable psychosocial environment.	•Inability of the adolescent and/or caregivers to understand the risks and benefits of the procedure, comply with pre- and post-operative indications and long-term follow-up. • Medical, psychiatric, psychosocial or cognitive condition of the adolescent that prevents adherence to the instructions. • Relative contraindications include untreated or uncompensated mental health disorders. • A medically correctable cause of obesity and a disability that could affect adherence to postoperative treatment, current pregnancy, or breastfeeding. • The associated risk-benefit analysis should include consideration of the potential long-term health risks of obesity.

Surgery does not mark the end of obesity treatment; on the contrary, it means the beginning of a period of nutritional and behavioral changes, in terms of food education and exercise, with regular monitoring by a multidisciplinary team of health professionals.[11] The dignity of the person is one of the major foundations of society and consists, above all, in seeing the human being in his specificity to respond appropriately to his needs. To achieve this goal, respect is the greatest benefit and, in clinical practice, it allows the patient to submit to the indications, knowing the risks and benefits and the direction of their choice for the option that best suits them, consciously considering the scientifically proven and ethically acceptable principles of medicine.[16]

Recent studies[53], have demonstrated a significant improvement in postoperative quality of life after RYGB and laparoscopic adjustable gastric banding (LAGB) in adolescents, similar to improvements seen in adult cohorts.[53] Short-term data show that variables such as depression improve markedly in adolescents after BS[54], but long-term data have not been well studied, thus, depression is not an exclusion criterion for BS.[55]

CONCLUSIONS

The BS treatment of morbid obesity in adolescents is a therapeutic modality that can be considered in a selected group with severe obesity, who meet the requirements and recommendations set out above, with the aim of improving their quality of life, reducing metabolic risks, associated diseases and early mortality. The available evidence has demonstrated the safety and effectiveness of these procedures in weight loss and improvement of associated diseases. However, these are invasive and irreversible procedures, with long-term results and complications largely unknown at these ages, so their indication, performance and follow-up must be in the hands of qualified multidisciplinary teams dedicated to the comprehensive care of these patients to ensure their safety and expected results.

It must be considered that this management must involve a multidisciplinary team, involving parents, family members, patients and professionals in question, to create a solid support network. In relation to clinical trials, these should be carried out with larger cohorts, and the follow-up time should be longer, including early adulthood, to provide greater scientific support for their application. Finally, it is important to highlight that BS should not be indicated as an isolated procedure, but rather be associated with a set of interventions aimed at strengthening permanent changes in lifestyle.

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