Fight against obesity – is bariatric surgery the answer?

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Obesity is a medical state in which an individual has excessive body fat that causes an increased risk of metabolic derangement. It is conventionally defined as a body mass index (BMI) of 30 kg/m² or more. Although it may not be considered as a disease by itself, it has been long associated with many diseases that are often detrimental to health, such as coronary artery disease, stroke, diabetes, osteoarthritis, obstructive sleep apnea and more. Consequently, obesity leads to more functional limitations, decreased health-related quality of life, and increased utilization of the healthcare system. Currently more than half of Canadians are reported as overweight (BMI of 25 kg/m² or higher) or obese, with nearly a quarter of the population being obese.

A more concerning feature is that this proportion has doubled between 1980s and today, and it is still increasing. A systematic review of articles published between 1990 and 2009 showed that obesity accounts for approximately 0.7% to 2.8% of a country’s total healthcare expenditure. In addition, the average medical costs spent on an obese individual were approximately 30% greater than the costs on an individual with normal weight. In Canada where healthcare costs are universally covered, the total healthcare costs for being overweight and obese were estimated to be $6.0 billion, which is 4.1% of the total health expenditure in 2006. Although direct comparisons between countries are often difficult due to different methodologies implemented in measuring associated medical costs, higher weight-associated healthcare expenditures in Canada can be linked to a higher rate of overweight and obese individuals. In Ontario, an obese individual lays an additional burden of about $180 to the healthcare system over one year compared to a normal-weight individual adjusted for other health-related factors such as age, gender, socioeconomic status, and physical activity status. In addition, obesity is also associated with other factors that cannot be easily quantified in monetary value but nevertheless impact one’s life, such as quality of life and level of education.

Considering the socioeconomic downfalls of obesity, the benefits of weight loss are apparent both for individuals and society. As obesity is closely associated with lifestyle factors such as poor dietary choices and sedentary lifestyle, the current management of obesity focuses mainly on lifestyle intervention. Weight loss interventions also often provide social and psychological supports for improved effectiveness. The Counterweight Programme, a weight loss programme in primary care in the UK which provides dietary and physical exercise schemes and also follow-ups, is estimated to cost approximately $370 per individual per year. This cost does not include many extra costs imposed on individuals, such as additional food costs and the costs of fitness club memberships. A study by Roux and colleagues included medical, non-medical, and time per patient costs for weight loss programmes, and estimated an individual cost of US$3,040 per year. Although lifestyle interventions may still be cost-effective, they require long-term commitment in both time and energy, with often less-than-expected results.

Several factors associated with attrition include decreased body image, decreased mental health, lower social support, lower self-efficacy, patient’s higher weight loss expectation, and cost. As a result, lifestyle modification is often combined with pharmacotherapy, such as orlistat, sibutramine and rimonabant. Although effective in weight reduction, the cost of intervention with anti-obesity medications per quality-adjusted life-year (QALY) was estimated to be US$20,000. In addition, adverse effects of medication and high rates of weight regain limit the use of pharmacotherapy.

Currently, the most effective treatment of obesity is bariatric surgery which results in 30% sustained weight loss, compared to 5-10% weight loss with behavioural and pharmacological intervention. Three commonly-performed procedures are laparoscopic adjustable gastric banding (LAGB), laparoscopic sleeve gastrectomy (LSG), and Roux-en-Y gastric bypass (RYGB). LAGB is a restrictive procedure where a hollow, flexible silicone band is placed distal to the gastroesophageal junction, reducing the stomach capacity. This causes early satiety and decreased food intake, consequently resulting in weight reduction. LSG involves resection of a large portion of stomach, thus also reducing the stomach capacity. This is often a first of a two-stage procedure, where rerouting of the small intestine is performed to reduce calorie absorption, especially the absorption of fat. RYGB is the most common procedure performed in North America, comprising 51% of the total bariatric procedures. It is a combination of both restrictive and malabsorptive procedures and involves creating a small pouch of stomach and rerouting the small intestine. The mid-portion of the jejunum is dissected and the distal portion is anastomosed with the small gastric pouch. The proximal small bowel, connected to the excluded portion of the stomach, forms a biliopancreatic limb and is anastomosed with the distal jejunum. A malabsorptive state from bariatric surgery results in favourable metabolic effects superior to those achieved by lifestyle and pharmacological intervention. Its more substantial and long-lasting weight loss effects place bariatric surgery as an attractive method of weight reduction.

In Ontario bariatric surgery is currently indicated for patients with BMI of 40 kg/m² who are refractory to medical management, including lifestyle modifications, or individuals with BMI greater or equal to 35kg/m² with a major obesity-related comorbidity such as hypertension, diabetes, or obstructive sleep apnea. Currently, the only operative bariatric technique being insured in Ontario is the RYGB, although multiple private clinics offer the LAGB technique. Although randomized control trials (RCT) comparing the efficacy of bariatric surgery with standard medical management are few, they do point to a significant benefit of surgical management to decrease morbidity and mortality. The landmark Swedish Obese Subjects (SOS) study (a large prospective multicenter matched cohort study) showed a significant mortality benefit for
patients who received bariatric surgery compared to non-surgical conventional treatment. Subsequent retrospective and prospective studies have also shown similar results. RCTs between RYGB and LAGB have shown the RYGB procedure to have increased weight loss, improved resolution of comorbidities, lower reoperation rates and better patient satisfaction. However, LAGB offers faster recovery time and a slightly lower rate of perioperative mortality and operative morbidity.

The economic benefit from a payor’s perspective show that the long term (10 years to lifetime) cost-effectiveness of surgery compared to non-surgery has been estimated to be US$1000-40,000 per QALY when using an incremental cost-utility ratio. A recent systematic review and analysis for the Canadian Agency for Drugs and Technologies in Health (CADTH) estimated the cost of bariatric surgery from a health care payor’s perspective to be CND$8,000-10,000 per QALY over the lifetime horizon in Canada when using an incremental cost-utility ratio. This estimate represents clear cost benefit for surgery compared to medical treatment alone. Furthermore, analysis within subgroups such as obese type 2 diabetics incurs even greater health and economic benefits. Recent meta-analysis evaluating bariatric surgery in patients with diabetes shows an incremental cost-utility ratio of US$7,000-10,000 per QALY and appears to provide a clear health net benefits and cost savings over non-surgical management. Moreover, from a payor’s perspective, bariatric surgery represents an upfront investment with subsequent savings spread throughout the patient’s lifetime in terms of both direct and indirect costs. Cost analysis between common surgical techniques are lacking and at this time no clear cost benefit can be assigned to RYGB versus LAGB, although it is known that LAGB when compared to RYGB offers shorter hospital stay and faster recovery time (measured as time to return to work).

Currently, Ontario performs approximately 2,000 bariatric procedures per year funded through the OHIP. There are estimated 300,000 Ontario residents that are believed to be in need of the procedure. Even with recent funding to increase the number of bariatric procedures provided by OHIP, there is still a significant wait time for the procedure. As clinicians, prevention through life-style modifications before obesity sets in may yet offer the best results. Nevertheless, bariatric surgery has provided resolution of comorbidities, lower reoperation rates and better patient satisfaction. However, LAGB offers faster recovery time and a slightly lower rate of perioperative mortality and operative morbidity.

REFERENCES

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