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Original article

Regional differences in the coverage and uptake of bariatric–metabolic surgery: A focus on type 2 diabetes

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Abstract

Background: There is high-quality evidence that bariatric–metabolic surgery (BMS) generates positive health outcomes in patients with obesity and type 2 diabetes (T2D).
Objectives: To understand the regional variations in the coverage and uptake of BMS, with a focus on T2D.
Setting: An Australian diabetes research institute.
Methods: A survey was conducted via a questionnaires sent to national leaders in BMS. The respondents provide their nations' BMS annual numbers, general and any T2D-specific indications for surgery, and source of surgical funding. The total population and adult diabetes prevalence (age 20–70 yr) of the countries were used to model the uptake of BMS for those with T2D.
Results: Data were provided from 22 countries, representing approximately 75% of BMS procedures performed in 2014. BMS uptake varied from 885 per million total population per year in Belgium to 2 per million per year in Japan. The estimated proportion of eligible individuals with diabetes treated annually varied from 1.9% in The Netherlands to $<.01$% in China and Japan. Few countries treat >1% of estimated eligible patients annually. Of 22 countries, 19 have national guidelines for BMS, and all incorporate BMI in the selection criteria. Several countries have specific criteria for patients with T2D.
Conclusion: Results indicated that BMS has a negligible impact on the global burden of T2D. The low uptake indicates that BMS has not become an established treatment for T2D and emphasizes the need to define when it should be recommended as a standard of care. BMS needs to be integrated into the clinical pathways for managing T2D. (Surg Obes Relat Dis 2016;▮:00–00.)

Keyword: Ethnicity; Clinical pathway; Therapeutic uptake; Diabetes surgery; Clinical inertia

Obesity, with its related complications, including type 2 diabetes (T2D), is a serious, progressive, chronic disease that needs a long-term chronic disease model of care. Bariatric–metabolic surgery (BMS) has proven to be an exceptional therapy for the treatment of individuals with clinically severe obesity, and those with obesity and T2D [1]. Recently, it has become clear that although surgery can deliver excellent glycemic control and diabetes remission in the majority of patients, there is a high relapse rate for those in remission [2,3]. In addition, there have been major advances in the health outcomes for patients with T2D who receive comprehensive care and risk management. Now, those diagnosed with T2D live longer and have reduced risk of developing most of the complications related to T2D [4]. In many countries, the incidence of T2D is falling, but its prevalence increasing, in part as a result of a longer life span [5,6]. The findings highlight the

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importance of surgery as an addition to, and complementing, medical therapy for T2D, rather than as an alternative stand-alone treatment. Integrating BMS with ongoing medical care is entirely consistent with current models of chronic disease management, and algorithms for managing patients with T2D should include surgical options.

In preparation for the Second Diabetes Surgery Summit (London, UK, 2015), I undertook a survey of bariatric–metabolic surgeons from a range of countries to assess how surgery was used for general indications, specifically for patients with T2D.

Methods

Standard questionnaires were emailed to national leading bariatric surgeons in a range of countries to survey the BMS indications and uptake in those countries (Box 1). Population data for the countries surveyed was obtained from the United Nations World population prospectus 2015 [7]. The prevalence of T2D in adults aged 20 to 70 years was obtained from the International Diabetes Federation Atlas update 2014 [8]. Estimates of the total world number of bariatric surgeries performed in 2014 were taken from the International Federation for the Surgery of Obesity (IFSO) president's report (Vienna, Austria, 2015). A specific focus of this survey was to look at surgery provided for patients with T2D.

Results

We received 24 survey results covering 22 countries and an estimated 432,092 procedures. This constitutes 75% of 574,148 procedures estimated to have been performed in 2014 (Table 1; Fig. 1). The number of procedures performed for every million people in each country surveyed varied from 885 per year in Belgium to just 2 per year in Japan. Five countries (Belgium, The Netherlands, France, the United States, and Australia) performed >500 procedure per million of the total population (see Table 1).

Box 1
Respondents were asked to provide the following information about their nation's bariatric–metabolic surgery access

- How many procedures are performed each year?
- Are there national guidelines?
- What are the current eligibility criteria for surgery?
- Any there any diabetes specific criteria?
- The proportion of those treated that have type 2 diabetes (T2D)?
- Is there universal national coverage in your country?
- If so what proportion are treated under this scheme?
- Do you have non-universal insurance coverage? Proportion of total?
- Do you have self-funded options for surgery? Proportion of total?

Table 1
The nations surveyed; current rate of bariatric–metabolic surgery performed (2014); and the national prevalence of type 2 diabetes

Country	No procedures per year	Population millions	Procedures /10^6 year	Prevalence of diabetes age 20–70 (%)
Australia	14,000	23.9	585.8	5.14
Austria	2500	8.5	294.1	8.97
Belgium	10,000	11.3	885	6.33
Brazil	94,000	207.8	452.4	8.68
Canada	6000	35.9	167.1	11.62
China	4125	1376	3	9.32
Czech Republic	1750	10.5	166.7	8.87
France	45,000	64.4	698.8	7.17
India	12,000	1311	9.2	8.63
Italy	9000	59.7	150.8	7.71
Japan	258	126.6	2	7.6
New Zealand	1100	4.5	244.4	12.14
Singapore	309	5.6	55.2	12.83
Spain	7500	46.1	162.7	10.58
Sweden	6800	9.7	701	6.14
Switzerland	4000	8.2	487.8	7.18
Taiwan	3000	23	130.4	9.92
The Netherlands	12,000	16.9	710.1	7.24
Turkey	9000	78.6	114.5	12.14
United Arab Emirates*	4500	9.2	489.1	10.68
UK*	6250	64.7	96.6	5.38
USA*	193,000	321.7	599.9	11.39

Population data for the 22 countries surveyed were obtained from the United Nations World population prospectus 2015. The prevalence of diabetes in adults aged 20 to 70 years was obtained from the International Diabetes Federation Atlas update 2014. Estimates of the total world number of bariatric surgeries performed in 2014 were taken from the International Federation for the Surgery of Obesity and Metabolic Disorders president's report, Vienna, Austria, 2015.

National guidelines

Three of the 22 countries do not have national guidelines for BMS. In Sweden, the indications for surgery are determined by the bariatric surgical team, and only 8.5% of those treated have a body mass index (BMI) of <35 kg/m^2. In the United Arab Emirates, the U.S. National Institutes of Health (NIH) criteria are generally used. In the United States, eligibility is still broadly based on these historic criteria but is also directed by coverage provided by individual government and private insurance payors, and, for devices, by indications approved by the U.S. Food and Drug Administration. Clearly, these NIH criteria are woefully out of date, as open bariatric surgery with only vertical banded gastroplasty and Roux-en-Y gastric bypass were only being considered at the time of formulating these criteria. There do not appear to be any instances of specific