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Review article

Is the Morbid Obesity Surgery Profitable in Times of Crisis? A Cost-benefit Analysis of Bariatric Surgery☆

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ABSTRACT

Morbid obesity is a serious health problem whose prevalence is increasing. Expensive co-morbidities are associated to these patients, as well as a reduction in the survival. Bariatric surgery resolves the co-morbidities (type 2 diabetes mellitus, 86.6%; cardiovascular risk, 79.0%; obstructive sleep apnea syndrome, 83.6%; hypertension, 61.7%), reduces the mortality rate (among 31%–40%), and increases the morbid obese patients survival over a 10-years period. It provides significant savings for the National Health System. The obese patients consume a 20% plus of health resources and 68% plus of drugs than general population. Bariatric surgery requires an initial investment (diagnosis-related group cost: 7468€), but it is recovered in a cost-effectiveness ratio of 2.5 years. Significant savings are obtained from the third year. To the direct economic benefits associated with reduced health expenditures an increase in tax collection should be added (sick leave and unemployment reduction are estimated in 18%, with a productivity increase of 57% for self-employed people). Bariatric surgery is one of the most cost-effective procedures in the healthcare system.

¿Es rentable operar a los obesos mórbidos en tiempos de crisis? Análisis coste-beneficio de la cirugía bariátrica

Palabras clave:
Coste-efectividad
Obesidad mórbida

RESUMEN

La obesidad mórbida es un problema grave de salud de prevalencia creciente que asocia costosas comorbilidades y reduce la supervivencia. La cirugía bariátrica (CB) además de

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resolver las comorbilidades (86,6% diabetes tipo 2; 79% riesgo cardiovascular; 83,6% apnea del sueño; 61,7% hipertensión arterial), reducir la mortalidad entre un 31–40% y aumentar la supervivencia de los obesos mórbidos 10 años, supone un importante ahorro al Sistema Nacional de Salud. Los obesos consumen un 20% más de recursos sanitarios y un 68% más de fármacos. La CB requiere una inversión inicial (grupos relacionados por diagnóstico: 7.468 €) que se recupera en un ratio coste-efectividad de 2,5 años y se consigue un ahorro significativo a partir del 3.er año. A la reducción directa de costes sanitarios se debería sumar el aumento en la recaudación de impuestos por reducción del 18% de paro y bajas y el aumento del 57% de la productividad de autónomos. La CB es una de las intervenciones más rentables del Sistema Nacional de Salud.

Introduction

In a time of budget limitations and scarce resources, it is imperative to establish which health interventions are necessary and profitable in terms of the health of the population and financial costs. The association between obesity and multiple and costly diseases such as type 2 diabetes mellitus (DM2), hypertension (HTN), obstructive sleep apnoea (OSA), arthropathies, cancer, and others[1,2] has made the care of obese patients problematic for the health care system. It is estimated that these patients consume 7% of the total healthcare cost in Spain, and after updating these costs to the year 2011, these patients account for approximately 2880 million Euros (€) per year.[3] This cost could be decreased through health interventions promoting weight loss and a decrease in the prevalence of associated diseases.[4,5]

The prevalence of obesity has been progressively increasing in our country, with prevalence rates increasing from 9.1% to 15% (1993–2009), according to the Spanish National Health Survey (NHS). In fact, Spain is one of the countries with the greatest prevalence of obesity in the European Union.[6–8] The prevalence of morbid obesity has increased by 200%, and 5%–8% of patients were found to have a body mass index (BMI) >35 and 1% with a BMI >40 in the ENRICA 2010 study.[9,10] The most worrisome aspect is the increase in childhood obesity, which has risen from 5% to 19.1% during the last 10 years, with 26.1% of children classified as overweight.[6] Without a doubt, prevention should be a priority of the health care system in order to slow this trend.[11] However, for obesity cases where the BMI >40 kg/m^2, no prevention or treatment measure has achieved a long-term efficacy greater than 10%, with the exception of bariatric surgery (BS), which is associated with the remission of comorbidities and an increase in the life expectancy of operated obese individuals.[12–14] The present study conducted a systematic review of the literature to evaluate the results of BS cost-benefits.

Materials and Methods

A meta-search was conducted in the following 9 databases using the terms ''bariatric surgery cost-effectiveness'' and ''bariatric surgery cost-utility'': Pubmed, Scopus, Web of Science, Amazon Books, Google Scholar, Google Books, Pubget, Eric, and Spacenet. Articles in English and Spanish were selected that described concrete data related to the effectiveness of BS and provided cost-effectiveness, cost-benefit, or cost-utility ratios. Two experts then decided on the inclusion or exclusion of these articles for the present study. Articles that did not provide concrete numerical data with respect to the morbidity associated with obesity, mortality associated with obesity, obesity costs for the health care system, BS-associated morbidity, BS-associated mortality, and BS-associated costs were excluded.

The Spanish National Health System (SNHS) statistical portal was consulted to obtain data regarding BS in Spain (costs by Diagnosis Related Groups (DRGs), length of stay, comorbidities, and SNHS data).

Results

Meta-search

A total of 4100 references were identified that included the words ''cost'' and ''obesity''. Eighty-two articles or book chapters were selected that made reference to the effectiveness, cost-effectiveness, cost-benefit, or cost-utility of BS. In the final review, 66 publications were included that provided specific numerical data (Fig. 1). These studies were grouped by topic for posterior analysis, and the complete texts were reviewed. The publication dates ranged between 1999 and 2012.

Costs Derived From Obesity

The evaluation of obesity management strategies requires prior analysis of the costs imposed on the healthcare system.[15,16] A review published in 2011 provided data from 19 European studies that evaluated the impact of obesity on the cost of different diseases.[17] For patients with diabetes, obesity increases the health costs by €812 per year for type 1 diabetes and by €454 for DM2; a 78% higher cost per capita has also been reported when obesity and diabetes are associated.[17,18] In Spain, obesity is responsible for 43% of the total costs related to DM2, more than 32% of the costs related to arthropathies, and more than 30% of the costs related to cardiac diseases.[23] In European countries, obesity contributes to a per capita increase of 20% in health care costs, and this increase in pharmaceutical expenses is 68% higher compared to normal weight patients.[17,19] Numerous studies have reported the estimated annual cost of obesity for European