CLINICAL RESEARCH STUDY

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Risk of Suicide after Long-term Follow-up from Bariatric Surgery

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ABSTRACT

PURPOSE: Bariatric surgery is recognized as the treatment of choice for class III obesity (body mass index ≥40) and has been increasingly recommended for obese patients. Prior research has suggested an excess of deaths due to suicide following bariatric surgery, but few large long-term follow-up studies exist. We examined postbariatric surgery suicides by time since operation, sex, age, and suicide death rates as compared with US suicide rates.

METHODS: Medical data following bariatric operations performed on Pennsylvania residents between January 1, 1995 and December 31, 2004 were obtained from the Pennsylvania Health Care Cost and Containment Council. Matching mortality data from suicides between September 1, 1996 and December 28, 2006 were obtained from the Division of Vital Records, Pennsylvania State Department of Health.

RESULTS: There were 31 suicides (16,683 operations), for an overall rate of 6.6/10,000; 13.7 per 10,000 among men and 5.2 per 10,000 among women. About 30% of suicides occurred within the first 2 years following surgery, with almost 70% occurring within 3 years. For every age category except the youngest, suicide rates were higher among men than women. Age- and sex-matched suicide rates in the US population (ages 35-64 years) were 2.4/10,000 (men) and 0.7/10,000 (women).

CONCLUSIONS: Compared with age and sex-matched suicide rates in the US, there was a substantial excess of suicides among all patients who had bariatric surgery in Pennsylvania during a 10-year period. These data document a need to develop more comprehensive longer-term surveillance and follow-up methods in order to evaluate factors associated with postbariatric surgery suicide.

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KEYWORDS: Bariatric surgery; Public health; Suicides

Bariatric surgery has emerged as the treatment of choice for class III obesity,[1,2] and by current criteria is appropriate for over 5% of the obese adult US population (body mass index [BMI] ≥40 or BMI ≥35 with comorbid conditions).[3] There are few studies of a longer-term follow-up of large samples of individuals who have had bariatric surgery. Although the reported short-term (eg, 30-day operative) mortality associated with these procedures is low,[4-10] studies with longer-term follow-up have better characterized death rates and associated risk factors.[6,10-19] Several prior studies have documented an excess of suicide deaths post bariatric surgery,[11,13,16,20-22] with the majority of events occurring more than 1 year post surgery. Adams and colleagues[11] found that the age, BMI, and sex-adjusted hazard of suicide in the surgical group was double that of matched controls, but the small absolute number of suicides (n = 21 in the surgical group vs. 8 among controls) limited power to detect statistically significant differences.

The reasons for an excess of suicides among these surgery patients are not known. The prevalence of depression and co-morbid mental illness is high among morbidly obese individuals[23-26] and bariatric surgery candidates.[27,28] Kalarchian and colleagues[27] reported a 66% lifetime his-

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tory of at least one axis I disorder (eg, mood, anxiety, substance use, or eating disorder) among candidates for bariatric surgery. Presence of an axis I disorder was significantly related to a higher baseline BMI and poorer functioning on all subscales of the SF-36, a validated measure of physical and emotional functional health status. Presurgical psychopathology may, in turn, contribute to postsurgical outcomes. Lifetime history of mood or anxiety disorder (compared with no history) has been associated with a significantly smaller decrease in BMI during the first 6 months following surgery.[29]

Literature on aspects of suicide and obesity is less clear. Suicidal ideation[26,30,31] and suicide attempts[26,31,32] increase with BMI, but suicide mortality bears a strong inverse relationship to BMI in men.[30,33,34] The role of weight change also appears to be important in understanding suicide risk.[35] Sansone and colleagues[36] reported that 10% of bariatric surgery candidates had a history of prior suicide attempts, a major risk factor for suicide mortality.[37] Despite perioperative psychological evaluation, there may be under-recognition and under-treatment of mental illness both before and after surgery,[38,39] perhaps in part due to inconsistencies in the initial evaluation of bariatric surgery candidates.[40] Given the increasing utilization of bariatric surgery as an effective treatment of severe obesity,[41-43] it is critical to better characterize the suicide risks among postbariatric surgery patients.

Detailed characteristics of suicides following bariatric surgery (eg, by time since surgery, age, sex, year of surgery) have not been widely published. We extend our prior work by describing these characteristics of all reported suicides among Pennsylvania residents who underwent bariatric surgery from January 1, 1995 to December 31, 2004 and died between September 1, 1996 and December 28, 2006. This study design captures suicides and methods of suicide related to all bariatric surgeries performed during this time period within the state of Pennsylvania, and therefore is not restricted to only a few major medical centers that may have unique selection criteria or follow-up programs.

CLINICAL SIGNIFICANCE

- Overall suicide rates among postbariatric surgery patients in Pennsylvania over 10 years were 6.6/10,000:13.7 per 10,000 among men and 5.2 per 10,000 among women. These are much higher than age and sex-matched US rates.
- ~70% of suicides occurred within 3 years after surgery, long past the usual 6-month monitoring period.
- Suicides are not necessarily attributed to the bariatric surgery, but may be related to myriad factors.

METHODS

Data were obtained from the following 2 sources: the Pennsylvania Health Care Cost and Containment Council database,[44] to identify patients hospitalized for bariatric surgery, and the Division of Vital Records, Pennsylvania State Department of Health, to determine suicides (as judged by the coroner or medical examiner) and obtain copies of death certificates.

The Pennsylvania Health Care Cost and Containment Council collects data in the state of Pennsylvania, including all hospital discharges and ambulatory/outpatient procedure records each year from hospitals and freestanding ambulatory surgery centers. The hospitals and freestanding surgery centers are required by law to electronically submit quarterly administrative data for all inpatient discharges and select specified ambulatory/outpatient procedures within 90 days after the end of a quarter.

The study design and methods of ascertainment of bariatric surgery cases has been previously described in detail.[16] All state-resident patients who underwent bariatric surgery in Pennsylvania were identified in the Pennsylvania Health Care Cost and Containment Council database. Each study subject fulfilled the following criteria: all inpatient discharges with International Classification of Diseases, Ninth Revision, Clinical Modification diagnosis codes of 278.00 (obesity, unspecified) or 278.01 (morbid obesity); and all inpatient discharges with major diagnostic group code 10 and diagnostic related group code 288 (operating procedures for obesity). Thus, to be included, an individual would need to have International Classification of Diseases, Ninth Revision, Clinical Modification code 278 or 278.01, and group codes 10 and 288.

The following variables were collated for each patient: age at surgery, sex, race, date and year of surgery, hospital where the surgery was performed, county in which the surgery was performed, and primary operating surgeon. After identification of the patient cohort, the data were directly matched with the database of the Division of Vital Records, Pennsylvania State Department of Health, using the Social Security number of patients in addition to age and sex. The matching was performed directly between the staffs of the Pennsylvania Health Care Cost and Containment Council and the Division of Vital Records. A positive match would occur only if a patient had died and the death certificate was archived by the Division of Vital Records. Suicide was determined by the county coroner or medical examiner.

The death certificates of the patients who had undergone bariatric surgery and who had died from suicide within the study period (n = 31) were made available to us for review. Pennsylvania residents who died outside the state would be missed by the surveillance methods. Less than 2% of Pennsylvania residents are estimated to have died outside the