



Perceptions of obesity and cancer risk in female bariatric surgery candidates: Highlighting the need for physician action for unsuspectingly obese and high risk patients



Melissa S. Henretta^{a,*}, Amy R. Copeland^b, Sarah L. Kelley^c, Peter T. Hallowell^d, Susan C. Modesitt^e

^a Stony Brook Medicine, Division of Gynecologic Oncology, Stony Brook, NY, USA

^b University of Virginia, School of Medicine, Charlottesville, VA, USA

^c University of Virginia, College of Arts and Sciences, Charlottesville, VA, USA

^d Department of Surgery, University of Virginia School of Medicine, Charlottesville, VA, USA

^e Gynecologic Oncology Division, University of Virginia School of Medicine, Charlottesville, VA, USA

HIGHLIGHTS

- Despite a mean BMI of 48.7kg/m², 29% of women did not recognize their obesity.
- Most women identified obesity as increasing uterine cancer but half still perceived it was not likely/possible to develop it.
- Menstrual irregularities (along with subsequent intervention) were exceedingly common and 32% had prior hysterectomy.

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ABSTRACT

Objectives. To determine: 1) whether obese women perceive themselves to be obese or at risk for malignancy, 2) perceived impact of obesity on cancer risks, 3) compliance with cancer screening, and 4) rates of menstrual dysfunction.

Methods. Surveys were administered to female patients presenting for bariatric weight loss surgery. Demographics, gynecologic history, perception of cancer risk, and screening history were collected/analyzed. Women were categorized as obese (BMI: 30–39 kg/m²), morbidly obese (40–49 kg/m²), super obese (≥50 kg/m²) and compared.

Results. Ninety-three women (mean age: 44.9 years, mean BMI: 48.7 kg/m²) participated and 45.7% felt they were in 'good', 'very good', or 'excellent' health despite frequent medical comorbidities. As BMI increased, women were more likely to correctly identify themselves as obese (23% of obese vs. 77% of morbidly obese vs. 85% of super obese; $p < 0.001$) but there were no significant differences in comorbidities. Two-thirds of women correctly identified obesity as a risk factor for uterine cancer, yet 48% of those retaining a uterus perceived that it was "not likely/not possible" to develop uterine cancer. Menstrual irregularities were common as was evaluation and interventions for the same; 32% had prior hysterectomy. Participation in cancer screening was robust.

Conclusions. Women presenting for bariatric surgery have high rates of menstrual dysfunction. While they perceive that obesity increases uterine cancer risk, they often do not perceive themselves to be at risk. This disconnect may stem from the fact that many failed to identify themselves as obese perhaps because overweight/obesity has become the norm in U.S. society.

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Introduction

Obesity is estimated to lead to 280,000 deaths each year in the United States, making it the second most common cause of preventable death only behind tobacco [1]. According to the Centers for Disease

Control, in 2012, 35.7% of U.S. adults are obese based on body mass index (BMI ≥ 30 kg/m²) [2] and 6.3% qualify as morbidly obese (BMI ≥ 40 kg/m²). For these obese patients, there is an estimated increased medical cost per patient of \$1,429 [3]. Despite all that has been learned about the causes and effects of obesity, especially the increase in cancer risk, this information has been slow to percolate through both the medical community and the general public. For example, a survey of 1,545 women performed by Soliman et al. showed that the majority of women did not realize the connection between body weight and endometrial cancer [4].

* Corresponding author at: Stony Brook Medicine, Department of Obstetrics, Gynecology, and Reproductive Medicine, Division of Gynecologic Oncology, 110 Nicolls Road, Stony Brook, NY 11794, USA. Fax: +1 631 444 3409.

E-mail address: Melissa_duarte@yahoo.com (M.S. Henretta).

The increased relative risk for a woman to develop cancer depends in part on her BMI. Often, the greater the BMI, the greater the relative risk for developing cancer [5–7]. Despite the fact that cancer risk increases with increasing BMI, obese women have been less likely to follow pre-established screening regimens. For example, many studies have documented that obese women are more likely to have delays in testing or to be screened less often for cancer of the cervix [8–14]. For a patient to be screened for cancer, either the patient or the physician must be aware of the need. In the case of cervical, breast, and colon cancer, this takes the form of following pre-established recommendations for cancer screening with Pap tests, mammograms, and colonoscopy, respectively; however there is no current recommendation for endometrial cancer screening in the general population.

Women who are candidates for bariatric surgery represent an extremely high risk population for endometrial cancer. Women and their physicians must recognize the signs and symptoms for endometrial cancer and understand the predisposing risk factors. Obesity itself is a risk factor for endometrial pathology, with one series demonstrating approximately 7% of women presenting for bariatric surgery were found to have endometrial hyperplasia on biopsy [15].

A retrospective study conducted at the University of Virginia demonstrated that of the 1482 women undergoing bariatric surgery for weight loss from 1990–2006, 53 (3.6%) had a pre- or post-operative diagnosis of cancer. Of those 53 women, there were 15 cases of breast cancer, 9 cases of endometrial cancer, and 6 cases of cervical cancer [16]. Furthermore, obesity-related cancers developed at an extremely young age in the bariatric surgery patients compared to both obese controls and the general population. Yet, given that most cases of endometrial cancer develop from abnormal precursor tissue (endometrial hyperplasia), the possibility exists that the actual prevalence of abnormal pathology is much higher, especially in this population. At the present time, the pre-operative gynecological evaluation required for bariatric surgery routinely includes mammograms and Pap tests. However, given that these patients are extremely obese, and therefore may be at an increased risk of menstrual dysfunction and abnormal endometrial pathology, the question arises whether an endometrial biopsy should be considered in the pre-operative evaluation for women seeking bariatric surgery for weight loss.

This project was a survey study targeted at a population of women who were potential candidates for bariatric surgery. The objectives of this study were to: 1) examine whether obese women perceive themselves to in fact be obese and/or at high-risk for malignancy, 2) determine the perceived impact of obesity on cancer risk in general, 3) document compliance with cancer screening examinations, and 4) identify rates of baseline menstrual dysfunction in this high risk group. An abnormal menstrual history could indicate that a woman needs evaluation for endometrial cancer. If these obese patients are found to have high rates of menstrual dysfunction, this could be a group who would benefit in the future from endometrial biopsies.

Methods

The University of Virginia's Institutional Review Board for Health Sciences Research approved this survey instrument. The survey was developed with the assistance of the University of Virginia's Center for Survey Research. Two groups of women were included in this survey. The first were female patients age 18 and above presenting for consideration of bariatric surgery for weight loss. Women were excluded if they were unwilling to complete the survey, or if they were not fluent in written English. These female patients presenting for an initial visit for bariatric surgery were given a survey during their appointment. It was emphasized that the survey was voluntary and that the patients' care would not be affected by willingness to participate. Furthermore, patients were made aware that even if they accepted the survey, they did not need to complete it. If they chose to participate, participants returned their completed surveys in an anonymous drop-box. A total

of 31 women responded. The second cohort of women had agreed to participate in a prospective study which included endometrial biopsy at the time of bariatric surgery. Survey data were de-identified to be included with the initial cohort, with the addition of 62 patients. Data were collected from December, 2008 through May, 2013.

This survey instrument was divided into six sections. Section A contained questions about patient demographics. Section B asked about personal and family history of cancer, since history could be important in perception of cancer risk. Section C determined the perceived susceptibility and severity of cancer, and the perceived impact of obesity on cancer risk. Obesity was never defined for participants. Section D asked a complete obstetrical and gynecologic history, including a detailed menstrual history. Section E addressed screening test (colonoscopy, mammography, Pap tests, endometrial sampling) uptake. Section F asked about medical history and prior gynecologic surgery. The survey contained a total of 61 questions.

Participants were not identified before or after survey completion, and medical records were never reviewed. Consent was implied by completion of the survey for the first cohort and the second cohort signed an informed consent form to participate. Statistical analysis was performed with Microsoft Office Excel 2007 and SPSS 20.0 (Chicago, IL). Frequency data was reported as a percentage of respondents. Mean, standard deviation, range were determined when applicable and Chi square and one way analysis of variance (ANOVA) used for comparison of groups as necessary for comparisons with a p value of <0.05 deemed significant.

Results

From December, 2008 through May 2013, surveys were distributed to women meeting study criteria. Of those 93 completed surveys, 31 (57%) were returned of the distributed anonymous surveys, and 62 of those women (100%) agreed to participate in the prospective biopsy study. The two groups of women were compared and there were no significant differences between the groups; therefore, they were combined and not further differentiated. We do not have information regarding the women who did not agree to participate in this study.

Table 1 displays the self-reported characteristics of this population. The mean age of respondents was 44.9 years (range 21–69). The mean body mass index was 48.7 kg/m² (range 30.9–83.0 kg/m²). Sixty-eight percent perceived themselves as obese, and 25.4% as overweight. Seventy-seven percent were Caucasian, 30 (32.3%) had prior hysterectomies, and 44.1% felt they were in 'good', 'very good', or 'excellent' health whereas 53.8% felt they were in 'fair' or 'poor' health. Of the 93 women surveyed, 37.6% and 57.0% carried a diagnosis of diabetes mellitus and hypertension, respectively. Almost all respondents reported having a primary care physician (96.8%) and the majority saw a family physician (70.5%). With regard to personal history of cancer, 11 women (10.8%) reported a personal history of cancer including four cervical cancers, three skin (including one patient who also had non-Hodgkin's lymphoma), one uterine cancer, one breast cancer, and one kidney cancer.

Table 2 describes the respondents' personal perception of cancer risk, the perceived severity of a cancer diagnosis, and the perceived impact of obesity on cancer risk. Women as a whole did not perceive their risk of developing breast, cervical, colon or uterine cancer to be very high as between 35 and 45% of patients responded that their personal likelihood of developing cancer was either "not likely" or "not possible." This is contrast to the fact that roughly 50% of these women felt that obesity increased (or increased a lot) the risk of these same cancers. For example, when looking at the patients' perceived risk of developing uterine cancer, even after excluding the 30 women who had undergone hysterectomy, 45.2% perceived that they were "not likely" or it was "not possible" to develop uterine cancer despite the fact that 50% of women correctly identified obesity as "increasing" or "increasing a lot" the risk of uterine cancer, and 74.2% felt the

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