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Recommended Citation
Kuroki, Lindsay M.; Benn, Teri E.; Dukes, Jonathan L.; Hagemann, Andrea R.; Thaker, Premal H.; Powell, Matthew A.; Mutch, David G.; Massad, L. Stewart; and Zighelboim, Israel, "Awareness of the association between obesity and peri-operative risk among newly diagnosed patients with complex atypical hyperplasia and endometrial cancer." Gynecologic Oncology Reports. 12, 41-44. (2015).
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Survey Article

Awareness of the association between obesity and peri-operative risk among newly diagnosed patients with complex atypical hyperplasia and endometrial cancer

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Abstract

Objectives: The aim of this study is to evaluate knowledge of obesity-related peri-operative risks in women newly diagnosed with complex atypical hyperplasia and endometrial cancer.

Methods: We conducted a cross-sectional study of patients newly diagnosed with complex a typical hyperplasia or endometrial cancer who underwent preoperative counseling between 2011 and 2014, using a 17-item questionnaire. Obesity was defined as body mass index (BMI) of 30 kg/m2 or greater. Bivariate analysis was conducted using Pearson’s Chi-Square or Fisher’s Exact tests where appropriate and Mann–Whitney U for continuous variables.

Results: Of 98 patients recruited, mean age was 58 years, 87% were obese, 83% white, and 51% had grade 1 endometrioid adenocarcinomas. Sixty-four percent of obese women reported that their physicians had discussed surgical risks related to obesity. However, 17% of obese and 42% of non-obese patients responded that they were unsure of the peri-operative risks associated with obesity. There was a substantial lack of understanding among obese patients regarding their increased risks of respiratory problems (29%), thromboembolism (29%), heart attack (35%), or longer operating time (35%) and hospital stay (47%). However, obese patients were more aware of wound infection risks associated with obesity compared to their non-obese counterparts (72% vs. 31%, p = 0.004).

Conclusions: Pre-operative counseling for obese women with newly diagnosed endometrial cancer should incorporate more focused education about obesity-related risks. They report being knowledgeable about the risks associated with their surgery; however, more than a quarter are unaware of the impact obesity has on respiratory problems, thromboembolism, wound infection, heart attack or longer operating time and hospital stay.

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Background

Obesity is a growing problem in the United States over the past 20 years with the prevalence remaining high despite new regulations and interventions implemented by the U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention (CDC), the Institute of Medicine, and the U.S. Surgeon General (Calle et al., 2003). Results from the 2011–2012 National Health and Nutrition Examination Survey (NHANES) estimated that 34% of U.S. adults are overweight, 35% are obese, and 6% are extremely obese (Fryar and Ogden, 2014).

Obese women are a vulnerable population who face not only economic hardships and social isolation, but medical comorbidities as well. They are at increased risk of heart disease, diabetes, hypertension, stroke, hyperlipidemia, osteoarthritis, sleep apnea, and certain cancers such as endometrial, breast, and colon cancer. Among these, endometrial cancer has the highest association with obesity with up to a 9-fold increased risk of mortality in women with body mass index (BMI) > 40 compared to women of normal weight (RR 6.25, p < 0.001, 95%CI 3.75–10.42) (Calle et al., 2003; Chia et al., 2007).

Unfortunately, obesity predisposes women not only to pre-invasive and invasive uterine cancer, but it also places them at higher risk for
complications related to surgical treatment options. The integration of minimally invasive surgical techniques in gynecologic oncology has improved peri-operative morbidity and length of hospital stay (Walker et al., 2009; Seamon et al., 2009). However, there remain specific risks related to obesity that warrant pre-operative discussion such as longer operative time, diminished tissue oxygenation and immune function, and increased risks for deep venous thrombosis, pulmonary embolism, respiratory failure and need for mechanical ventilation, cardiac complications, nerve injury, infection and bleeding (Bamgbade et al., 2007; Choban et al., 1995; Dossett et al., 2008).

Despite a growing medical interest establishing the link between obesity it is unclear how much information is effectively communicated to patients to heighten their understanding. Given that obesity is a modifiable risk factor with widespread implications in cancer prognosis and treatment options, it is imperative to first ascertain where gaps in knowledge exist in order to design effective interventions to guide patient education. There is limited but growing evidence that women are unaware that obesity increases the risk for complex atypical hyperplasia (CAH) and endometrial cancer (Ligibel et al., 2014; Ackermann et al., 2005). However, to our knowledge, there are no studies to date that focus on their understanding of the impact obesity has on surgical management options and potential complications. Therefore, we aimed to evaluate knowledge of obesity-related peri-operative risks in women with newly-diagnosed CAH or endometrial cancer and to identify areas for improvement in peri-operative counseling.

Materials and methods

We performed a single institution survey study of 98 women newly-diagnosed with CAH or endometrial cancer between January 2011 and July 2014. Prior to the initiation of the study, all procedures were reviewed and approved by Washington University's Human Research Protection Office (HRPO#201101905). All participants were at least 18 years of age, able to read and write in English and provide signed informed consent. We included patients with CAH given that this disease is part of a continuum of uterine pathology with shared risk factors for endometrial cancer and evidence to suggest that up to 43% of women with CAH have occult grade 1 endometrial cancer (Trimble et al., 2006). Diagnoses were established by pre-operative endometrial tissue sampling and all specimens underwent central review by the Department of Pathology at Barnes Jewish Hospital. Furthermore, both obese and non-obese patients were included to assess for differences in knowledge of surgical risks related to obesity based on body mass index (BMI). Obesity was defined as BMI of 30 kg/m² or greater.

We excluded patients with recurrent disease and confirmed all diagnoses by documented histology on pathology reports. All patients invited to participate were under the care of gynecologic oncologists at Washington University School of Medicine and Siteman Cancer Center, a National Cancer Institute-designated comprehensive cancer center. No patients were eligible or approached after surgery.

During their preoperative-planning, outpatient appointment, patients were approached if eligible and were assured of anonymity and confidentiality. They were allowed to complete the questionnaire at the time of their appointment in a private room, or later at home returning forms in a self-addressed envelope provided. Those who did not return the survey after 2 weeks were followed up with a telephone call as a courtesy reminder.

A 17-item questionnaire was administered. We did not identify a validated questionnaire of this type. However each question in the survey was supported by prior studies citing specific surgical complications related to obesity and was validated by review by a panel of gynecologic oncologists. The questionnaire also obtained sociodemographic information including age, race, history of smoking, alcohol and illicit drug use, and highest level of education. We reviewed electronic medical records to confirm each patient’s past medical and surgical history, as well as obtain their American Society of Anesthesiologists (ASA) score.

Demographic information was summarized with descriptive statistics. Bivariate analysis was conducted using Pearson’s Chi-Square or Fisher’s Exact tests where appropriate for categorical variables. The Anderson–Darling test along with visual assessment of histograms were used to determine whether the distribution of continuous variables was Gaussian. The variable, “age” was found to be normally distributed and bivariate analysis was conducted with the Student’s t-test. All other non-parametric, continuous variables were analyzed using the Mann–Whitney U test. Analysis was performed using Stata 10 (College Station, Texas) and an association was considered statistically significant if \( p < 0.05 \).

Results

Between 2011 and 2014, 107 women met eligibility criteria and consented for study enrollment, of whom 98 women (92%) completed the self-administered questionnaire. Eight-five had a BMI > 30 kg/m² and of these women, 79 (93%) acknowledged their obesity while 6 (7%) were unsure if they met criteria for obesity. Overall, the mean age was 58 years, 83% were white, 54% had achieved a college education and among all patients, 75% understood that the risks of surgery are increased in obese patients compared to patients of normal weight. However, 16% of obese and 38% of non-obese women responded that obesity is a risk factor for high blood pressure, diabetes, and heart attacks, they had more limited appreciation of the association between obesity and cancer. Nearly half of obese patients and 31% of non-obese patients answered that endometrial cancer is more common in overweight or obese people.

Next we explored patients' understanding of their surgical risks. Among obese patients, 92% reported that their physician had discussed specific risks associated with the indicated procedure versus only 64% recalled obtaining information about obesity-related surgical risks. Among all patients, 75% understood that the risks of surgery are increased in obese patients compared to patients of normal weight. However, 16% of obese and 38% of non-obese women responded that they were unsure of the specific peri-operative risks associated with obesity. There was a substantial gap in understanding among obese patients regarding their increased risks of respiratory problems (29%), thromboembolism (29%), heart attack (35%), or longer operating time (35%) and hospital stay (47%) (Table 2). However, although a significant minority of obese women were unaware of the link, obese patients were more aware of wound infection risks associated with obesity than their non-obese counterparts (72% vs. 31%, \( p = 0.004 \)).

Conclusion

Patients with CAH and endometrial cancer appear to be well-informed that obesity is a risk factor for medical comorbidities such as hypertension, diabetes, and heart disease, but their scope of knowledge beyond this is limited. Only half of obese patients recognized that their weight places them at increased risk for endometrial cancer and 36% were not aware of obesity-related surgical risks. Furthermore, they report being knowledgeable about the risks associated with their planned operative procedure; however, more than a quarter are unaware of the impact obesity has on respiratory problems, thromboembolism, wound infection, heart attack or longer operating time and hospital stay.

Our findings provide new insight into patients’ limited awareness of the peri-operative risks related to obesity and reinforce the need for
IQR = interquartile range. GED = general educational development; ASA = American Society of Anesthesiologists; one case of complex atypical hyperplasia.

More focused education about obesity-related risks. In 2003, Harvard University's Interfaculty Program for Health System's Improvement conducted a national poll of 1,002 men and women aged 18 or older to explore their knowledge about obesity. Similar to our findings, most Americans knew obesity increases the risk of hypertension (86%), diabetes (78%), and heart disease (86%), but only half of participants were aware that obesity also increases the risk of some cancers (Obesity as a Public Health Issue: A look at Solutions, 2003). More recently, Soliman et al. (2008) conducted a study among women in the Houston community assessing their knowledge of obesity and endometrial cancer risk. Again, consistent with our results, 58% were not aware that obesity increased the risk for endometrial cancer. There was no association between personal weight and knowledge of obesity-associated risks; however, they did find that black women were least knowledgeable about the relationship between obesity and cancer.

These gaps in knowledge are clinically significant, as obesity is a modifiable risk factor that is becoming a central challenge in cancer prevention and care with widespread impact on diagnosis, available treatment options, and ultimately survival outcomes (Ligibel et al., 2014). A landmark study by Calle et al. (2003) heightened awareness...
of the magnitude of this problem. They reported that women with a BMI > 40 kg/m² have a 60% higher death rates from all cancer compared to women of normal weight. Furthermore, they predicted the proportion of deaths from cancer that is attributable to overweight and obesity in U.S. adults aged 50 or older may be as high as 20% in women (Calle et al., 2003).

Appropriately, obesity has become a pivotal issue in women’s health (ACOG committee opinion, 2005). The American Society of Clinical Oncology (ASCO) recently released a policy statement (Ligibel et al., 2014) identifying 4 priorities to address the obesity–cancer link including: 1) increasing providers’ and patients’ core knowledge about the role of energy balance in cancer risk and prevention; 2) developing clinical guidance and resources to help providers educate their patients; 3) research promotion; and 4) improving access to evidence-based obesity treatment services for cancer patients and survivors.

The ASCO policy statement also highlights that a cancer diagnosis may serve as a teachable moment to discuss risk-reducing or health-protective behaviors. A survey of U.S. gynecologic oncology providers affirmed this window of opportunity, stating that 85% agreed or strongly agreed on the importance of addressing obesity with cancer survivors (Jernigan et al., 2013). Historically, oncologists have played a limited

Patients. These discussions should not only address the link between obesity and cancer, but also should incorporate the impact of weight on surgical management and specific obesity-related peri-operative risks. Gynecologic oncologists are in a pivotal position to positively impact survival outcomes by recognizing and seizing teachable moments about obesity and lifestyle modifications throughout our lifelong relationship with our cancer patients.

Conflict of interest statement

The authors have no significant financial disclosures. The Siteman Cancer Center is supported by NCI Cancer Center Support Grant P30 CA91842. This publication was supported by the Washington University Institute of Translational Sciences (ICTS) grant UL1 TR000448 from the National Center for Advancing Translational Sciences. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Health. Dr. Bradley Evanoff is the PI for the Clinical and Translational Science Award that supports all Washington University ICTS and Clinical Research Training Center activities.

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