GYNECOLOGY

Hysterectomy risk in premenopausal-aged military veterans: associations with sexual assault and gynecologic symptoms

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BACKGROUND: Several gynecological conditions associated with hysterectomy, including abnormal bleeding and pelvic pain, have been observed at increased rates in women who have experienced sexual assault. Previous findings have suggested that one of the unique health care needs for female military veterans may be an increased prevalence of hysterectomy and that this increase may partially be due to their higher risk of sexual assault history and posttraumatic stress disorder (PTSD). Although associations between trauma, PTSD, and gynecological symptoms have been identified, little work has been done to date to directly examine the relationship between sexual assault, PTSD, and hysterectomy within the rapidly growing female veteran population.

OBJECTIVES: The objective of the study was to assess the prevalence of hysterectomy in premenopausal-aged female veterans, compare with general population prevalence, and examine associations between hysterectomy and sexual assault, PTSD, and gynecological symptoms in this veteran population.

STUDY DESIGN: We performed a computer-assisted telephone interview between July 2005 and August 2008 of 1004 female Veterans Affairs (VA)—enrolled veterans $\leq$ 52 years old from 2 Midwestern US Veterans Affairs medical centers and associated community-based outreach clinics. Within the veteran study population, associations between hysterectomy and sexual assault, PTSD, and gynecological symptoms were assessed with bivariate analyses using χ^2, Wilcoxon-Mann-Whitney, and Student *t* tests; multivariate logistic regression analyses were used to look for independent associations. Hysterectomy prevalence and ages were compared with large civilian populations represented in the Behavioral Risk Factor Surveillance System and American College of Surgeons National Surgical Quality Improvement Program databases from similar timeframes using χ^2 and Student *t* tests.

RESULTS: Prevalence of hysterectomy was significantly higher (16.8% vs 13.3%, $P = .0002$), and mean age at hysterectomy was significantly lower (35 vs 43 years old, $P < .0001$) in this VA-enrolled sample of female veterans compared with civilian population-based data sets. Sixty-two percent of subjects had experienced attempted or completed sexual assault in their lifetimes. A history of completed lifetime sexual assault with vaginal penetration (LSA-V) was a significant risk factor for hysterectomy (age-adjusted odds ratio, 1.85), with those experiencing their first LSA-V in childhood or in military at particular risk. A history of PTSD was also associated with hysterectomy (age-adjusted odds ratio, 1.83), even when controlling for LSA-V. These associations were no longer significant when controlling for the increased rates of gynecological pain, abnormal gynecological bleeding, and pelvic inflammatory disease seen in those veterans with a history of LSA-V.

CONCLUSION: Premenopausal-aged veterans may be at higher overall risk for hysterectomy, and for hysterectomy at younger ages, than their civilian counterparts. Veterans who have experienced completed sexual assault with vaginal penetration in childhood or in military and those with a history of PTSD may be at particularly high risk for hysterectomy, potentially related to their higher risk of gynecological symptoms. If confirmed in future studies, these findings have important implications for women's health care providers and policy makers within both the VA and civilian health care systems related to primary and secondary prevention, costs, and the potential for increased chronic disease and mortality.

Key words: hysterectomy, sexual assault, veteran health

Hysterectomy is the second most commonly performed major surgery for women of reproductive age in the United States,[1-3] with recent prevalence estimates between 3.7% and 14% and lifetime risk estimated at 45%.[4-7] Although quality-of-life benefits of surgery are clear, controversy exists regarding potential associations between hysterectomy in premenopausal-aged women and increased cardiovascular disease and mortality risk,[8-14] and hysterectomy may at times represent a costly failure to provide more appropriate conservative treatment options.

The likelihood of hysterectomy increases with age, parity, number of miscarriages, weight, and married status and varies by race (with black women generally at higher risk), education (rates are highest in less educated groups) and US geography (rates are highest in the South and lowest in the Northeast).[15,16] Commonly cited indications for hysterectomy include the following: uterine fibroids, abnormal uterine bleeding, endometriosis, uterine prolapse, cancer, benign neoplasms, and pelvic pain.[1,6,17,18]

Several of these conditions, including abnormal bleeding and pelvic pain, have been observed at increased rates in women who have experienced sexual assault.[19-23] In addition to plausibly causing direct damage to the pelvis and its gynecological organs, the experience of sexual assault may influence women's gynecological symptom experience[24-27] and their reproductive decision making.

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Exposure to sexual assault has been associated with voluntary childlessness and problems with sexual functioning, for example,[28,29] as well as avoidance of pelvic examinations.[30] Given these associations, women with a history of sexual assault may more frequently experience distressing gynecological symptoms and also be more likely to subsequently elect for definitive surgical management (hysterectomy) that will render them infertile and less in need of regular cervical cancer screening.

Previous findings have suggested that one of the unique health care needs for female military veterans may be an increased prevalence of hysterectomy[31] and that this increase may partially be due to their higher risk of sexual assault history and posttraumatic stress disorder (PTSD).[17] Reported prevalence of sexual assault for female veterans varies between 11% and 48% during military service and between 21% and 46% during childhood.[22,32-40]

Prevalence findings may vary based on utilization of Veterans Affairs (VA) care, with increased prevalence of sexual assault exposure seen for those who utilize VA care.[40] Whereas lifetime prevalence of PTSD is estimated to be 10.4% in all women,[41] rates of current PTSD diagnosis have been reported ranging from 35% to 60% in female veterans, with the highest rates in women who have experienced military sexual trauma.[35,42,43]

There is a growing body of work examining the relationship between trauma and gynecological conditions.[44-46] Although associations between trauma, PTSD, and gynecological symptoms have been identified,[17,44-46] little work has been done to date to directly examine the relationship between sexual assault, PTSD, and hysterectomy within the rapidly growing female veteran population.

Our objectives were to assess prevalence of hysterectomy in premenopausal-aged female veterans enrolled in VA care, compare this with general population prevalence, and examine associations between hysterectomy and sexual assault, PTSD, and gynecological symptoms in this veteran population.

Materials and Methods

Participants and procedures

Potential participants were identified from the electronic records of 2 Midwestern VA medical centers. Female veterans 52 years of age and younger enrolled at one of the centers or associated community-based outreach clinics in the 5 years previous to, or during, the interview dates of July 2005 to August 2008 were recruited to participate in a computer-assisted telephone interview.

VA enrollment could have been initiated to receive health care, complete a disability claim, enroll in a registry, or respond to veteran outreach. Potential subjects were recruited via mail and telephone protocols, which have been described in detail elsewhere.[21,28] Women who returned their signed consent forms and met inclusion criteria completed a computer-assisted telephone interview that included questions related to demographics, lifetime sexual assault, gynecological diagnoses and procedures, general and mental health history, health risk behaviors, and care seeking.

The majority of interviews were completed in a single phone call (89%) and lasted an average of 1 hour 16 minutes. Participants who completed the interview were reimbursed $30.00 (US dollars). The study was approved by Institutional Review Boards of the University of Iowa and the Iowa City VA Medical Center.

For the purpose of the funded grant and primary goal of the larger study (to determine premenopausal-aged female veterans' competing risk factors, including lifetime sexual assault, associated with cervical cytological abnormalities), subjects were excluded from participation if they were older than 52 years, were aware of in utero diethylstilbestrol exposure, or were currently receiving immunosuppressants. This reduced the involvement of those at unusually high risk of cervical dysplasia or genital malignancy.[21]

Sixty-nine percent of the identified sample (1670 of 2414) were located and invited to participate, 63% of whom agreed to participate. Women who refused participation did not differ significantly from those who participated with regard to age, self-report of very good or excellent health, number of gynecological visits in the last year, or ever having had an abnormal Papanicolaou smear.[21,47] Ninety-five percent of women who agreed to participate completed their interviews; however, 15 were missing data for items related to hysterectomy or sexual assault and were excluded from all analyses, giving a sample size for analysis of 989.

Measures

The primary outcome for this study was hysterectomy, which was operationalized as removal of the uterus, with or without oophorectomy or salpingectomy. Women who reported a hysterectomy were asked follow-up questions to identify reasons for the surgery. Possibilities within the computer-assisted interview program included the following: excessive bleeding, chronic pelvic pain, abnormal Papanicolaou smear, prolapsed uterus, cancer (ovarian, cervical, or uterine), noncancerous fibroids, benign tumor, "tired of pelvic examinations," childbirth complications, sexual assault damage, and some other reason. Women who reported having a hysterectomy for some other reason were asked to specify the reason as an open-ended response.

Sexual assault (SA) was assessed using the definition adopted by the American Medical Association (1995) and the American College of Obstetricians and Gynecologists (1997), which includes any sexual act that occurred without a woman's consent involving the use or threat of force or against the woman's wishes and includes attempted or completed sexual penetration of the vagina, mouth, or rectum by penis, fingers, or object.[48,49]

Sexual assaults in which an attempt was made but penetration did not occur were deemed attempted SA; completed SA were assaults in which penetration did occur. This definition was read to participants, and women were asked whether they had experienced any such act. Women reporting 1 or more SA were