

Trends in Hysterectomy Rates and Approaches in the VA

Katherine Y. Lee, MD; Gregory J. Raff, MD; Laura A. Douglass, MD; Kelly M. Kasper, MD; Ryan M. Kuster, MPA; George J. Eckert, MAS; Imtiaz A. Munshi, MD; and Jeffrey F. Peipert, MD, PhD

The VA has the opportunity to expand gynecologic surgical services and improve access for the 1 in 3 women veterans who are referred to non-VA facilities for their gynecologic surgical needs.

The VA operates the largest integrated health care system in the country, consisting of 144 hospitals and 1,221 outpatient clinics. This system provides medical care for about 22 million veterans. In 2015, women accounted for nearly 10% of the veteran population and are expected to increase to about 16% by 2040.¹ With an expected population increase of 18,000 per year over the next 10 years, women are the fastest growing group of veterans.

The VA acknowledges that women are an integral part of the veteran community and that a paradigm shift must occur to meet their unique health needs. Although clinical services specific to women veterans' health needs have been introduced within the VA, gynecologic surgical services must be addressed in order to improve access and provide comprehensive women's health care within the VA system.



About 600,000 hysterectomies are performed annually in the U.S., making this procedure one of the most commonly performed in women.² Over the past 30 years, technologic advances have allowed surgeons to perform more hysterectomies via

minimally invasive methods. Both the American Congress of Obstetricians and Gynecologists and American Association of Gynecologic Laparoscopists have published consensus statements that minimally invasive hysterectomy should be the standard of care.^{3,4} Studies in non-VA facilities have shown that practice patterns in the route of hysterectomy have evolved with the advancement of surgical equipment and techniques.

It is uncertain, however, whether these changes in practice patterns exist in the VA, because there are limited published data. Given the frequency of hysterectomies in the U.S., the rate and route of this procedure are easily identifiable measures that can be evaluated and utilized as a comparison model for health care received within the VA vs the civilian sector.

The aim of this study was to assess the changes in rate and surgical approach to benign hysterectomy for women veterans at VAMCs and referrals to non-VA facilities over a 10-year period. The authors' hypothesis was that a minimally invasive approach would be more common

Dr. Lee is a Minimally Invasive Gynecologic Surgery fellow, **Dr. Kasper** is an associate clinical professor and the director of Minimally Invasive Gynecology Surgery, **Dr. Peipert** is the chair of the Department of Obstetrics and Gynecology, and **Mr. Eckert** is a biostatistician supervisor in the Department of Biostatistics, all at Indiana University School of Medicine in Indianapolis. **Mr. Kuster** is a program analyst in the Office of Planning, Analysis, and Business Intelligence; **Dr. Raff** is the chief of gynecology; and **Dr. Munshi** is the interim chief of staff, all at the Richard L. Roudebush VAMC in Indianapolis. **Dr. Douglass** is an assistant professor at the Department of Obstetrics and Gynecology, Pritzker School of Medicine in Chicago, Illinois.

in recent years. This study also compares published national data to evaluate whether the VA is offering comparable surgical services to the civilian sector.

METHODS

The institutional review boards of Indiana University and the Richard L. Roudebush VAMC in Indianapolis, Indiana, approved this retrospective cross-sectional study. The VHA Support Service Center (VSSC) authorized access to VA database information.

All women veterans who underwent hysterectomy for benign indications from fiscal years (FY) 2005 to 2014 were included. In order to identify this group, the authors queried the VA Corporate Data Warehouse (CDW) and the Non-VA Care Cube for all hysterectomy current procedural terminology (CPT) codes typically performed for benign indications, including 58150, 58152, 58180, 58260, 58262, 58263, 58267, 58270, 58290, 58291, 58292, 58293, 58294, 58541, 58542, 58543, 58544, 58550, 58552, 58553, 58554, 58570, 58571, 58572, and 58573. For each patient identified, the following variables were collected: date of the procedure, facility location, primary CPT code, primary ICD-9 code, and patient age. Patients whose primary ICD-9 code was for a malignancy of gynecologic origin were excluded from the study.

The CDW is a national database collected by the VA Office of Information and Technology to provide clinical data for VA analytical purposes. The Non-VA Care Cube identifies services purchased for veterans with non-VA care dollars and, therefore, captures women veterans who were referred outside the VA for a hysterectomy. Additional data collected include age, gender, hospital com-

Table. Characteristics of Hysterectomies Performed at the VA by Surgical Route From FY 2005-FY 2014^a

Characteristics	Laparoscopic Hysterectomy N = 1,510 (18.1%)		Vaginal Hysterectomy N = 1,704 (20.4%)		Abdominal Hysterectomy N = 5,113 (61.4%)		All Types of Hysterectomy N = 8,327	
	n	%	n	%	n	%	n	%
Age, y								
< 40	472	31.3	512	30.0	1,150	22.5	2,134	25.6
40-64	1,026	67.9	1,148	67.4	3,933	76.9	6,107	73.3
64+	12	0.8	44	2.6	30	0.6	86	1.0
Surgical diagnosis								
Abnormal uterine bleeding	487	32.3	566	33.2	1,057	20.7	2,110	25.3
Fibroids	438	29.0	375	22.0	2,631	51.5	3,444	41.4
Pelvic pain	283	18.7	227	13.3	656	12.8	1,166	14.0
Pelvic organ prolapse	51	3.4	324	19.0	88	1.7	463	5.6
Cervical dysplasia	58	3.8	108	6.3	171	3.3	337	4.0
Other	193	12.8	104	6.1	510	10.0	807	9.7
Districts								
North Atlantic (district 1)	337	22.3	352	20.7	970	19.0	1,659	19.9
Southeast (district 2)	405	26.8	318	18.7	1,579	30.9	2,302	27.6
Midwest (district 3)	214	14.2	336	19.7	744	14.6	1,294	15.5
Continental (district 4)	211	14.0	368	21.6	935	18.3	1,514	18.2
Pacific (district 5)	343	22.7	330	19.4	885	17.3	1,558	18.7

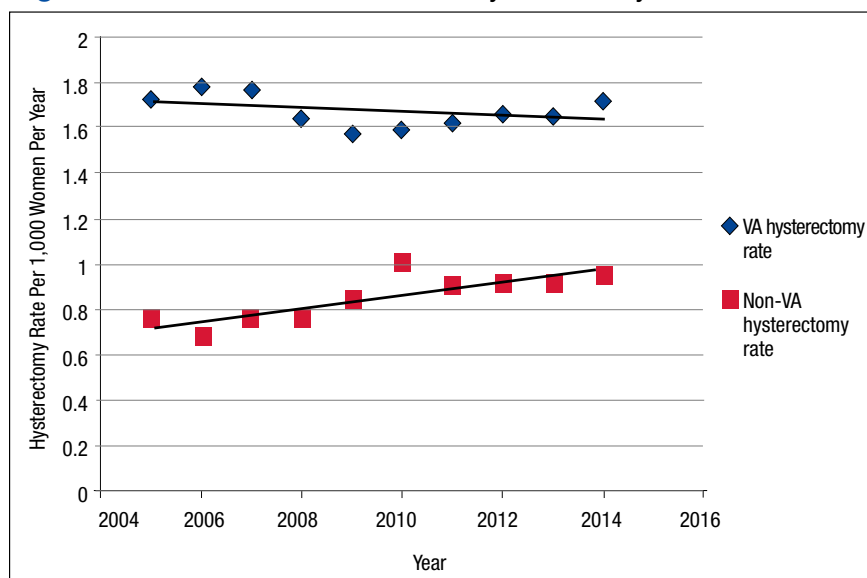
^aColumn percentages may not add to 100% due to rounding; all $P < .0001$ when comparing age, surgical diagnosis, and district across each type of hysterectomy.

plexity, place of care, payment location, primary CPT, primary ICD-9, and several other parameters. The annual number of women veterans accessing VA health care was extracted from the VSSC Unique Patients Cube.

Laparoscopic hysterectomy was defined as total laparoscopic hysterectomy, laparoscopic-assisted vaginal hysterectomy, laparoscopic-supracervical hysterectomy, and robotic-assisted laparoscopic hysterectomy. Minimally invasive hysterectomy was defined as all laparoscopic and vaginal hysterectomies.

Frequency distributions between categorical variables were compared using chi-squared tests. The population-adjusted hysterectomy rates were estimated by dividing the total number of hysterectomies by the number of women veterans accessing VA medical care. Hysterectomy rates are reported as rate per 1,000 women per year. A time trend analysis was performed with linear regression to evaluate the slopes of trends for each route of hysterectomy, using Microsoft Excel 2010 (Redmond, WA). The authors

Figure 1. VA and Non-VA Rates of Hysterectomy^a



^aAll routes of hysterectomy were included; mean percent change per year for VA rate = -0.0089% and for non-VA rate = 0.0287%; *P* < .01 for differences in slopes between VA and Non-VA hysterectomies.

analyzed the relationship between route of hysterectomy and fiscal year, using a multivariable logistic regression that was adjusted for age, district, and surgical diagnosis. The adjusted relative risk (RR) for each type of hysterectomy was reported with 95% confidence intervals (CI). All statistical analyses were performed using SPSS 12.0 (Chicago, IL) with *P* < .05 defined as being statistically significant.

To ensure the accuracy of the CDW data, the documented CPT and ICD-9 codes were compared between the CDW and the VA electronic medical records (EMR) for 400 charts selected at random. This cohort represents about 5% of the total charts and was felt to be an adequate measure of the entire sample since the CPT and ICD-9 codes were verified and matched 100% of the time. Demographic and descriptive data regarding body mass index, level of education, race, smoking status, medical comorbidities, and

surgical history were excluded from the study because it was either not available or not consistently reported within the CDW.

RESULTS

A retrospective query of the CDW identified 8,327 hysterectomies performed at the VA for benign indications from fiscal year (FY) 2005 to FY 2014. The total number of annual hysterectomies at the VA increased 30.7% from 710 in FY 2004 to 1,025 in FY 2014. The annual number of women veterans who accessed VA health care increased 30.8% from 412,271 to 596,011 during the same time frame. Thus, the population adjusted hysterectomy rate remained stable at 1.72 (Figure 1). The table shows the relative proportion of hysterectomy cases performed at the VA by age, indication for surgery, and geographic location stratified by route of hysterectomy. The mean age at time of hysterectomy was 44.2 (SD 7.7) years. The most frequent indi-

cations for all types of hysterectomy were uterine leiomyoma (41.4%), abnormal bleeding (25.3%), pelvic pain (14.0%), and pelvic organ prolapse (5.6%) (Table). Because of this study's large sample size, there were significant differences among the hysterectomy types when comparing age, surgical diagnosis, and district.

The authors also analyzed the VA data by district and decided to highlight the most recent data trends, as this is most applicable to how the VA currently operates. During FY 2014, the VA hysterectomy rates were as follows: district 1 (North Atlantic) 1.52; district 2 (Southeast) 2.21; district 3 (Midwest) 1.47; district 4 (Continental) 1.43; and district 5 (Pacific) 1.64 (Figure 2). District 2 had the highest adjusted hysterectomy rate, and district 3 had the highest percentage of minimally invasive hysterectomies (63.8%).

During the study period, calculated hysterectomy rates based on route at the VA showed that the laparoscopic hysterectomy rate increased from 0.11 to 0.53, the vaginal hysterectomy rate remained relatively stable at 0.34 to 0.37, and the abdominal hysterectomy rate declined from 1.28 to 0.8 (Figure 3). The percentage of hysterectomies performed via a minimally invasive approach increased from 25.9% (184/710) to 53.7% (550/1,025), (RR 2.1; 95% CI 1.9, 2.4). More specifically the percentage of laparoscopic hysterectomy increased from 6.2% (44/710) to 30.6% (314/1,025), (RR 5.7; 95% CI 4.5, 7.0; *P* < .0001), vaginal hysterectomy increased from 19.7% (140/710) to 23% (236/1,025), (RR 1.7; 95% CI 1.4, 2.0; *P* < .0001), and abdominal hysterectomy declined from 74.1% (526/710) to 46.3% (475/1,025), (RR 0.48; 95% CI 0.4, 0.5; *P* < .0001).

From the Non-VA Care Cube,

4,296 women veterans were identified who underwent hysterectomy for benign indications at referral non-VA facilities from FY 2005 to FY 2014. The total number of patients referred annually to non-VA facilities for hysterectomy increased 45% from 312 to 567, with an increase in the population adjusted hysterectomy rate from 0.76 to 0.95 (Figure 1).

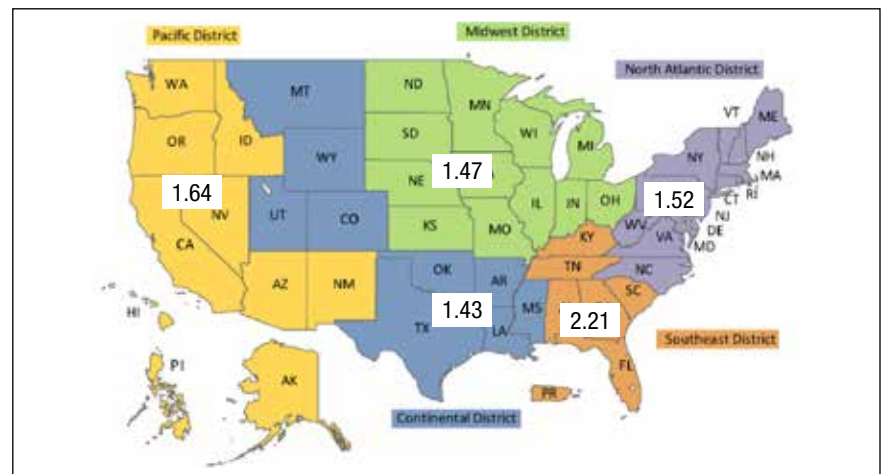
DISCUSSION

Although the total hysterectomy rate within the VA remained stable during the study period, the minimally invasive hysterectomy rate increased significantly. In FY 2014, the majority of hysterectomies at the VA were performed via a minimally invasive approach. Minimally invasive hysterectomy has many recognized advantages over abdominal hysterectomy as it offers a significant reduction in postoperative pain, narcotic use, length of stay, intraoperative blood loss, fever, deep venous thrombosis, and a faster recovery with return to baseline functioning thus improving overall quality of life.⁵⁻⁷ Previous literature of VA hysterectomy data from 1991 to 1997 reported an abdominal hysterectomy percentage of 74%, vaginal hysterectomy percentage of 22%, and laparoscopic assisted vaginal hysterectomy percentage of 4%.⁸

Additionally, previous literature of the civilian sector reported a national laparoscopic hysterectomy percentage of 32.4% in 2012, which is comparable to the laparoscopic hysterectomy percentage found in this study.^{9,10} These data highlight the growth of laparoscopic hysterectomy at the VA, which is comparable to that of the civilian sector.

The Nationwide Inpatient Sample reported an abdominal hysterectomy percentage of 66.1% in 2003 and 52.8% in 2012.^{9,10} The authors

Figure 2. Fiscal Year 2014 VA Hysterectomy Rates



observed a similar decline in the abdominal hysterectomy rate at the VA over the period studied. Although many factors may have contributed to this decline, the growth of laparoscopic hysterectomy was a possible contributing factor since the vaginal hysterectomy rate remained stable over the study period. Future studies are needed to evaluate surgical complications and readmission rates in order to more accurately assess the quality of gynecologic surgical care provided by the VA compared with the civilian sector.

Strengths and Limitations

This study has several important strengths. First, the large sample size from VA nationwide databases included information from all VAMC performing hysterectomies. Second, this study included 10 years of data, with the latest data from 2014, allowing for depiction of both long-term and recent trends.

Potential issues with large databases such as the CDW and the Non-VA Care Cube included inaccurate coding of procedures and diagnoses as well as missing data. This possible limitation was addressed by randomly selecting 400 patients in

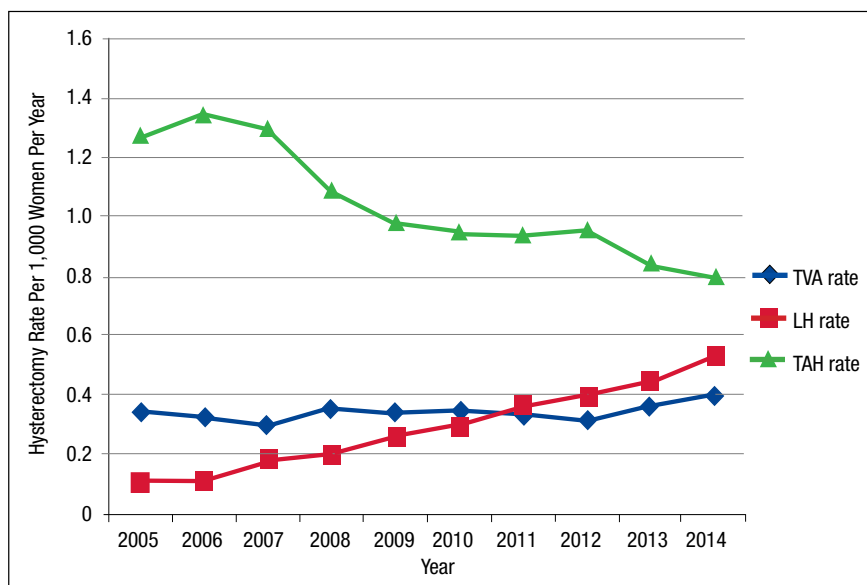
the database to verify the database information against the patient's EMR, which matched 100% of the time. In addition, the authors calculated the hysterectomy rates using a denominator based on all women veterans accessing VA health care, which included women who had previously had a hysterectomy. Therefore, the true hysterectomy rate may have been underestimated.

CONCLUSION

The VA operates the largest health care system in the U.S. with more than 500,000 women veterans currently utilizing VA health care.¹¹ The VA provides services to women veterans living in urban, suburban, and rural areas. The breadth of geographic locations, the declining number of VA facilities offering gynecologic surgical services, and the growing population of female veterans present unique challenges to providing accessible and comparable health care to these female patients.

VA district 4 (Continental) has the lowest population density as well as the lowest VA hysterectomy rate in FY 2014, which may be attributable to the aforementioned challenges. As a result of these challenges, an

Figure 3. VA Hysterectomy Rate by Route of Hysterectomy^a



Abbreviations: LH, laparoscopic, laparoscopic-assisted vaginal, and robotic hysterectomies; TAH, total abdominal hysterectomy; TVH, total vaginal hysterectomy.

^aP < .01 for differences in slopes between TVH, LH, TAH.

increasing number of gynecologic surgical referrals to non-VA facilities was observed during the study period.

The VA has made considerable progress in supporting and promoting health care for women by strategically enhancing services and access for women veterans. Although the number of hysterectomies has increased across VA facilities offering gynecologic surgical services, about 1 in 3 women veterans are referred to non-VA facilities for their gynecologic surgical needs. The VA has a challenging opportunity to expand gynecologic surgical services and

improve access for the growing population of women veterans. To accommodate this growth, the VA may consider strategically increasing the number of facilities providing gynecologic surgical services or expanding established gynecologic surgical departments. ●

Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

Disclaimer

The opinions expressed herein are those of the authors and do not necessarily

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