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Medical contraindications to estrogen and contraceptive use among women Veterans

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Abstract

Background—Women Veterans have high rates of medical comorbidities and may be particularly vulnerable to adverse health outcomes associated with unintended pregnancy.

Objectives—To estimate the prevalence of medical contraindications to estrogen-containing combined hormonal contraception among women Veterans of reproductive age, and to evaluate the relationship between contraindications and contraceptive use.

Study design—This is a secondary analysis of data from a cross-sectional, telephone-based survey with a national sample of 2,302 female Veterans, ages 18–45, who use the Veterans Administration Healthcare System for primary care. This analysis includes women at risk of unintended pregnancy, defined as heterosexually active, not pregnant or trying to conceive, and with no history of hysterectomy or infertility. Seven contraindications to combined hormonal contraception were identified using survey data or medical diagnosis codes: hypertension, coronary artery disease, active migraine in women over 35 or migraine with aura, smoking in women over 35, and history of thromboembolism, stroke or breast cancer. Outcomes were current use of combined hormonal contraception and contraceptive method type (combined hormonal contraception, other prescription methods, non-prescription methods or no method). Multivariable logistic and multinomial regression were used to assess the relationship between contraindications and combined hormonal contraception use and method type, respectively.

Results—Among 1,169 women Veterans at risk of unintended pregnancy, 339 (29%) had at least one contraindication to combined hormonal contraception. The most prevalent conditions were

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hypertension (14.9%) and migraine (8.7%). In adjusted analyses, women with contraindications were less likely than women without contraindications to report use of combined hormonal contraception (aOR:0.54, 95% CI:0.37–0.79). Relative to use of combined hormonal contraception, women with contraindications were more likely than women without contraindications to use other prescription methods (aOR:1.74, 95%CI:1.17–2.60), non-prescription methods (aOR:1.96, 95%CI:1.19–3.22) and no method (aOR:2.29, 95%CI:1.35–3.89).

Conclusion—Women Veterans at risk of unintended pregnancy have a high burden of medical contraindications to estrogen. Women with contraindications were less likely to use combined hormonal contraceptive methods, but were more likely to use no method, suggesting unmet need for contraception in this medically vulnerable population.

Keywords

combined hormonal contraception; contraindications; estrogen; women Veterans

INTRODUCTION

The Veterans Affairs (VA) Healthcare System is the largest integrated healthcare system in the United States. Over the past several decades, the number of women Veterans using VA for health care has grown dramatically, and the majority of new female enrollees are of reproductive age.^{1,2} However, until recently, little has been known about contraceptive use and unintended pregnancy among women Veterans. Because women Veterans have high rates of medical and psychiatric comorbidities compared to women in the general population,^{1,3} this population may be at increased risk of the negative health outcomes associated with unintended pregnancy, including inadequate prenatal care, substance use during pregnancy, preterm birth and low birth weight.⁴ Ensuring access to contraceptive methods and counseling is therefore critical to support the reproductive and overall health of women Veterans.

To address the needs of this growing population, VA policy requires that women Veterans have access to comprehensive primary care from a provider who is proficient in gender-specific care, including contraceptive counseling and management.^{1,5} VA pharmacies provide the full range of hormonal contraceptive methods,⁶ and referrals to a gynecologist (on site, at another VA site or at a non-VA site via contract care) can be made as needed for contraceptive procedures such as sterilization or placement of intrauterine devices (IUDs) or subdermal implants.^{1,7} Nevertheless, variability exists across VA sites regarding expertise and comfort level of women's health providers, and consequent availability of on-site or same-day provision of procedural methods.^{8,9}

Among contraceptive methods, estrogen-containing combined hormonal contraception (CHC), including most formulations of the birth control pill, the transdermal patch, and the vaginal ring, remain the most popular forms of birth control; over 80% of sexually active women in the United States have ever used the birth control pill.¹⁰ Although most women can safely use CHC, specific medical conditions serve as relative or absolute contraindications, primarily due to concerns for increased risk of thrombotic and

cardiovascular conditions with estrogen use.¹¹ The United States Medical Eligibility Criteria for Contraceptive Use (U.S. MEC), produced by the Centers for Disease Control and Prevention, provides evidence-based recommendations regarding the safety of contraceptive methods for women with various medical conditions.^{12,13} Despite the specificity of these guidelines, the prevalence of medical contraindications to CHC is poorly defined. Prior studies estimate that anywhere from 2 to 39% of reproductive-aged women are medically “ineligible” to use estrogen-containing methods.^{14–17}

Medical contraindications to CHC may impact eligibility for and use of effective contraceptive methods, which may in turn contribute to unintended pregnancy. Understanding the impact of contraindications to CHC on contraceptive use among women Veterans is important to meet VA’s goal of providing high-quality reproductive health care, particularly given the high burden of medical comorbidities among the growing number of women using VA. Using data from a nationally representative, cross-sectional survey of female VA-users, we aimed to estimate the prevalence of contraindications to CHC in a population of women Veterans at risk of unintended pregnancy. We then aimed to characterize the relationship between contraindications and contraceptive use.

MATERIALS AND METHODS

Study design and population

This is a secondary analysis of data from the Examining Contraceptive Use and Unmet Need Among Women Veterans (ECUUN) study.¹⁸ ECUUN included a cross-sectional, telephone-based survey of a random, nationally representative sample of 2,302 women Veterans who use VA for healthcare. Eligible participants were female Veterans ages 18–45 who had at least one primary care visit within the VA Healthcare System in the prior 12 months. Potential participants were identified using VA administrative data, yielding a sampling frame of approximately 130,000 women. Overall, 8,198 potential participants were randomly selected and mailed study invitations; 2,769 participants were screened and enrolled in the study and 2,302 completed the survey, for an overall response rate of 28%. The survey completion rate was 83% among enrolled participants. Using VA administrative data, ECUUN participants were compared to non-participants and found to be similar with regard to age, race/ethnicity, marital status, income, geographic region and presence of medical and mental illness.¹⁸ This suggests that the ECUUN sample is representative of reproductive-aged female VA-users at large. Participants completed computer-assisted telephone interviews between April 2014 and January 2016. All participants provided informed consent. This study was approved by the Institutional Review Boards of the University of Pittsburgh and VA Pittsburgh Healthcare System. Complete methodology has been previously reported.¹⁸

This analysis is limited to women identified as at risk of unintended pregnancy, defined as sexually active with a male partner within three months prior to the study interview, not currently pregnant, trying to conceive, or less than two months postpartum, and without a history of hysterectomy or other infertility. Among the 2,302 women Veterans in the ECUUN sample, 1,173 (51%) were identified as being at risk of unintended pregnancy. Four women in the at-risk cohort reported current use of contraception but did not specify a

method type and were therefore excluded from analysis, resulting in a study sample of 1,169 women.

Measures

The primary predictor variable was at least one medical contraindication to CHC use. For every category of contraceptive methods, including CHC, the U.S. MEC characterizes specific medical conditions as Category 1 (no restriction on use), Category 2 (advantages generally outweigh theoretical or proven risks), Category 3 (theoretical or proven risks usually outweigh advantages) or Category 4 (unacceptable health risk).¹³ We defined contraindications to CHC as presence of at least one of the following Category 3 or Category 4 conditions: hypertension, coronary artery disease, history of thromboembolism, history of stroke, history of breast cancer, migraine with aura, migraine without aura in women over age 35, and current smoking by women over age 35.

Contraindications were primarily identified via self-report on the ECUUN survey. Participants were asked if they had ever (in their lifetime) been diagnosed with or received treatment for the above conditions, and smoking was assessed by asking “Do you currently smoke or use tobacco?” Self-report was felt to be the most accurate means of assessing contraindications due to recognized inconsistencies in medical diagnosis coding within the VA healthcare system; medical diagnosis codes are known to underestimate the true prevalence of medical conditions in VA because they are not used for physician billing as in other healthcare systems and because administrative data may exclude acute events and diagnoses occurring prior to VA enrollment or in non-VA settings.^{1,19} Furthermore, prior research in non-VA settings suggests that self-report is adequately reliable to assess medical contraindications to CHC;^{17,20,21} in Veteran populations, self-report is reliable for assessing similar, chronic health conditions.^{19,22} As the survey instrument was not sufficiently detailed to distinguish between Category 3 and 4 contraindications (e.g. controlled vs. uncontrolled hypertension, cigarettes smoked per day), only conditions definitively representing at least a Category 3 contraindication were included in this analysis. While Category 3 conditions do not represent absolute contraindications, there is broad consensus around the guideline that women with these conditions “generally should not use” CHC.²³

The most recent update to the U.S. MEC, published in July 2016, describes migraine with aura as a Category 4 contraindication, and re-characterizes migraine in women over age 35 from a Category 3 to a Category 2 condition.¹³ Because this update was released after completion of data collection, we defined contraindications to CHC according to the 2013 U.S. Specific Practice Recommendations for Contraceptive Use,²³ and include active migraine in women over 35 as a contraindication. The survey instrument assessed for lifetime incidence of migraines, but not for active migraine or presence of aura symptoms. Therefore, diagnosis of migraine with aura was determined by the presence of migraine with aura ICD-9-CM diagnosis codes (346.0, 346.3, 346.5, 346.6) in VA administrative data in the 10-year period preceding participants’ study interview. Active migraine in women over age 35 was defined by presence of diagnosis codes for any migraine (346.xx) over the 12-months prior to study interview for participants 35 years of age or older at interview.

Outcomes of interest were current use of CHC and current contraceptive method type, including no method. Current contraceptive use was defined as self-reported use of a method during the month preceding the study interview, as per convention.²⁴ Contraceptive methods were classified as: CHC (pill, patch, ring); non-CHC prescription methods (intrauterine device (IUD), subdermal implant, medroxyprogesterone injection, male and female sterilization); non-prescription methods (barrier methods, fertility-awareness methods, withdrawal); or no method. Women reporting current use of more than one method were classified first by any use of a CHC method and then according to their most effective method type.²⁵ For example, a woman reporting use of the pill and a partner's vasectomy would be classified as using a CHC method, and a woman reporting use of an IUD and condoms would be classified as using a non-CHC prescription method. The survey instrument did not distinguish between use of combined hormonal and progestin-only pills, thus some women who reported current use of the birth control pill may have been incorrectly characterized as using CHC. However, use of progestin-only pills is low in the United States overall,²⁶ and VA pharmacy data for ECUUN participants at risk of unintended pregnancy indicates that only 5% of women with VA prescriptions for oral contraception in the month prior to their study interview were prescribed progestin-only pills.

The following patient- and facility-level covariates were assessed using survey data: age, race/ethnicity, marital status, education, income, insurance, parity, history of military sexual trauma, gender of the VA primary care provider (PCP), whether a woman receives care at a VA women's health clinic, and whether a woman sees their VA PCP for almost all care and/or for routine gynecologic care such as Pap smears. VA administrative data were used to assess other facility-level characteristics, including geographic region.

Statistical analysis

Descriptive statistics were generated to describe study population characteristics for the total sample and by presence of medical contraindications to CHC. The frequency of any contraindications to CHC and each individual condition was calculated, as well as rates of contraceptive method type, including no method, by contraindication status. Chi square tests were used to test differences in rates of contraceptive method type by presence of contraindications to CHC.

Logistic regression was used to assess the relationship between contraindications to CHC and CHC use. Multinomial logistic regression was used to assess the relationship between contraindications to CHC and contraceptive method type, including no method, using CHC as the reference group. Interactions between race/ethnicity and contraindication status were assessed and included in the final model if significant. Patient-, provider- and facility-level covariates that were potentially associated with contraindications to CHC in bivariate analyses at the $p < 0.10$ level were included in the model. All analyses were conducted in Stata 14, with statistical significance set at $p < 0.05$.

RESULTS

In our sample of 1,169 women Veterans identified as at risk of unintended pregnancy, the mean age was 33.9 years (range 21–45); 54.2% were non-Hispanic White, 25.7% non-Hispanic Black, 12.7% Hispanic or Latina, and 7.4% non-Hispanic “other,” including multiracial, Asian, Pacific Islander and Native American women (Table 1). The majority of women were married or cohabitating (58.6%) and had a bachelor’s degree or higher (52.0%).

Overall, 339 women (29.0%) had at least one medical contraindication to CHC use (Table 2). Hypertension was the most prevalent condition (14.9%), followed by migraine with aura or migraine over age 35 (8.7%), and current smoking by women over age 35 (7.4%). Among women 35 years or older, 16.5% were current smokers, compared to 18.1% of women in the total sample. Most women with contraindications to CHC had only one condition ($n=275$, 81.1%); 54 women (15.9%) had two contraindications and 10 women (3.0%) had three contraindications (Appendix). Women with contraindications to CHC were generally older, had higher parity, and were more likely to be non-Hispanic Black than women without contraindications (Table 1).

Current contraceptive use and method type varied among women Veterans with and without contraindications to CHC. Overall, 88.5% of all women Veterans at risk of unintended pregnancy reported use of a contraceptive method in the past month: 22.1% used CHC methods, 50.5% used non-CHC prescription methods, and 15.9% used non-prescription methods (Table 2). Rates of CHC use were lower among women with contraindications compared to non-contraindicated women (13.6% versus 25.5%, $p<0.001$). Among the 258 women using CHC, 46 (17.8%) had contraindications to estrogen use; 25 women had hypertension, 14 had migraine and 11 were current smokers over age 35. Compared to women without contraindications, women with contraindications had higher rates of use of non-CHC prescription methods (56.1% vs. 48.2%, $p=0.02$) and higher rates of contraceptive nonuse (14.8% versus 10.2%, $p=0.03$). No significant differences were seen for use of non-prescription methods in bivariate analysis.

A more detailed breakdown of the percentage of women using individual contraceptive methods by contraindication status is shown in the Figure. The pill, which comprised the majority of CHC use, was used by a smaller proportion of women with contraindications compared to women without contraindications (11.2% vs. 20.1%, $p<0.001$). Women with contraindications had higher rates of tubal sterilization compared to women without contraindications (22.4% vs. 13.3%, $p<0.001$), while rates of use for other non-CHC prescription methods (vasectomy, IUD, implant, and injection) were not significantly different.

In unadjusted logistic regression analyses, women with contraindications to CHC were less likely to report use of CHC methods in the past month compared to women without contraindications (OR:0.46; 95% CI:0.32–0.65) (Table 3). The association between contraindications and CHC use remained significant after controlling for age, race/ethnicity, marital status, education, parity, insurance status, and VA PCP gender (adjusted OR:0.54;

95% CI:0.37–0.79). There were no interactions between race/ethnicity and contraindication status.

In both unadjusted and adjusted multinomial logistic regression analyses, women with contraindications to CHC were significantly more likely than women without contraindications to use non-CHC prescription methods (adjusted OR:1.74; 95% CI:1.17–2.60), non-prescription methods (adjusted OR:1.96; 95% CI:1.19–3.22) and no method (adjusted OR:2.29; 95% CI:1.35–3.89) as compared to using CHC (Table 3).

COMMENT

In a nationally representative sample of female VA-users at risk of unintended pregnancy, over one quarter of women had at least one specific medical contraindication to combined hormonal contraception. Women Veterans with contraindications were appropriately less likely to use CHC methods compared to women without contraindications, and were more likely to use other methods such as sterilization and non-prescription methods, relative to CHC. However, women with contraindications were also significantly more likely to report nonuse of any contraception. Thus, while our findings indicate some degree of appropriate medical screening for CHC method use, they also suggest unmet need for contraception among a population of medically vulnerable and sexually active women not desiring pregnancy.

That 29% of the women in our study had at least one medical contraindication to CHC is consistent with reported high rates of medical comorbidities among woman Veterans overall,¹ but is greater than most estimates of the prevalence of estrogen contraindications among women of reproductive age. Estimates of medical contraindications to CHC in the literature range from 2% among 14–45 year-old women seeking hormonal contraception,¹⁴ to 13% among privately insured 18–40 year-old women in Pennsylvania,¹⁵ to 16% among a national sample of fecund women ages 20–50.¹⁶ One study found a contraindication rate of 39% among primarily Latina women in El Paso, Texas;¹⁷ however, this was an older population with high rates of undiagnosed hypertension. Our results suggest that women Veterans of reproductive age have a relatively high burden of medical contraindications to estrogen use compared to estimates in other U.S. populations.

Our finding that women with medical contraindications to estrogen had significantly lower rates of CHC use compared to women without contraindications is consistent with some prior reports,¹⁶ but contrasts with a recent study which found that rates of CHC use did not vary significantly between women with and without contraindications.¹⁵ Among all current users of CHC in our study population, 17.8% had at least one contraindication to CHC use, a rate comparable to prior estimates of “inappropriate” CHC use.^{15,16,27,28} Women with contraindications to estrogen may have increased risk of venous thromboembolism, cardiovascular events and ischemic stroke with use of CHC; however, use of CHC by these women may still be less dangerous than the thrombotic risks inherent in pregnancy and delivery.^{11,29} Therefore, while use of CHC by women with contraindications may reflect inappropriate prescribing or failure to adequately screen for conditions precluding use of these methods, it is also conceivable that some women may have opted for use of CHC after

appropriate counseling, accepting the balance of known risks and benefits of these medications. This possibility is particularly relevant given that the ECUUN survey instrument was not sufficiently detailed to distinguish between Category 3 (relative) and 4 (absolute) contraindications to CHC use. Nevertheless, clinical guidelines clearly discourage prescribing of CHC to patients with a recognized Category 3 condition.

Decreased CHC use among women with contraindications was partially compensated for by relative increases in other prescription and non-prescription methods, although we also observed increased non-use of contraception among these women. While women Veterans overall have similar rates of unmet need for contraception compared to the general U.S. population,¹⁸ the elevated rate of non-use among women Veterans with medical comorbidities may be a cause for concern. Many women who are ineligible for CHC methods are likely candidates for highly effective, long-acting reversible contraceptive methods (LARC), including IUDs and implants. LARC use has increased more than five-fold among U.S. women in the past decade,³⁰ and ECUUN data suggests that female VA-users use these methods at higher rates than women in the general U.S. population.¹⁸ In this study, however, higher rates of tubal sterilization, rather than LARC use, appear to drive increases in non-CHC prescription method use among women with contraindications. This finding is likely reflective of the older age and higher parity of women with contraindications, but may also reflect this cohort's ineligibility for popular reversible contraceptive options. Despite the growing visibility and popularity of LARC methods, alternatives to well-known methods such as the pill may not be apparent or acceptable to women who cannot use CHC, thus contributing to contraceptive nonuse or the decision to seek a permanent form of contraception. VA has made great strides toward provision of comprehensive, gender-specific care by a single women's health provider;^{1,9} however, on-site provision of LARC methods varies, and discomfort or lack of LARC placement skills among primary care providers may still present barriers to LARC use among interested patients.⁸ Finally, in primary care settings, management of other conditions may take precedence over discussions about contraception, particularly for medically complex patients. Evidence suggesting that women with chronic medical conditions may be less likely to receive contraceptive counseling^{31,32} supports the hypothesis that women Veterans with medical comorbidities may receive suboptimal contraceptive care; however, future research is needed in this area.

This study has several limitations. First, the response rate was relatively low at 28%; however participants did not differ significantly from non-participants in terms of important demographic and clinical characteristics. Furthermore, our results may not be generalizable to women Veterans who do not use VA for health care. Female VA-users are of lower average income levels, more likely to be a racial/ethnic minority, and are more likely to carry a medical or psychiatric diagnosis as compared to women Veterans who do not use VA.³³ Second, our reliance on self-reported medical conditions may have resulted in inaccurate or incomplete characterization of contraindications to CHC use; however, prior work suggests that self-report is reliable for assessment of the conditions considered in this study.^{17,19–22} Due to inadequate specificity of the survey instrument for migraine conditions, we used ICD-9-CM codes for history of migraine with aura and active migraine in women over age 35; thus, our estimated prevalence of migraine contraindications (8.7%) is likely

conservative. Despite this limitation in our survey design, we included these diagnoses to the best of our ability due to their importance as prevalent and potentially under-recognized contraindications to CHC use,³⁴ particularly among younger, healthier women. Finally, it is difficult to directly compare our results to prior literature examining medical contraindications to CHC, as studies report on cohorts of varying age ranges and demographic characteristics, and methods used to evaluate medical contraindications are non-standardized.

Our evaluation of contraindications to CHC and contraceptive use among women Veterans provides insight into the state of contraceptive care for female VA-users who are medically ineligible for popular and effective hormonal methods. As the U.S. MEC continues to evolve and is increasingly utilized as a guide for safe prescribing of contraceptive methods, increased care should be paid to understanding how contraindications limit women's choices and consequent ability to use effective contraceptive methods, and to improve contraceptive options and counseling for these women. Future research should aim to better understand contraceptive counseling for and decision making among women Veterans with medical comorbidities, with the goal of guiding VA efforts to improve reproductive health care for the diverse and medically complicated population of women that it serves.

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Appendix. Number of conditions among women Veterans at risk of unintended pregnancy with contraindications to combined hormonal contraception

Medical Condition	n (%)			
	1 contraindication n = 339	1 Condition n = 275	2 Conditions n = 54	3 Conditions n = 10
Hypertension	174 (51.3)	133 (48.4)	31 (57.4)	10 (100.0)
Migraine with aura or migraine >35 ^a	102 (30.1)	62 (22.6)	33 (61.1)	7 (70.0)
Smoker > 35 years old	86 (25.4)	52 (18.9)	25 (46.3)	9 (90.0)
Thromboembolism	35 (10.3)	22 (8.0)	10 (18.5)	3 (30.0)
Stroke	9 (2.7)	3 (1.1)	5 (9.3)	1 (10.0)
Coronary Artery Disease	4 (1.2)	1 (0.4)	3 (5.6)	0 (0)
Breast Cancer	3 (0.9)	2 (0.7)	1 (1.9)	0 (0)

^aMigraine-related contraindications were determined by presence of ICD-9-CM diagnosis codes in VA administrative data: migraine with aura (346.0, 346.3, 346.5, 346.6) within 10 years prior to the study interview or any migraine (346.xx) within

12 months prior to study interview for women 35 years or older. All other conditions were determined via self-report on the survey instrument.

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Condensation

Women Veterans have a high burden of medical contraindications to estrogen-containing hormonal contraception, and there is unmet need for contraception among women with contraindications.

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Figure.

Percent use of individual contraceptive methods among women Veterans at risk of unintended pregnancy with and without contraindications to combined hormonal contraception. Data are most effective contraceptive method used in the past month. Significant p-values are displayed above the corresponding method type. CHC, combined hormonal contraception.

Table 1

Population characteristics among women Veterans at risk of unintended pregnancy and by medical contraindications to CHC

Variable	n (%)			p-value ^a
	Total n = 1169	1 contraindication to CHC n = 339	No contraindications to CHC n = 830	
Age (years)				p<0.001
20–29	266 (22.8)	22 (6.5)	244 (29.4)	
30–34	382 (32.7)	66 (19.5)	316 (38.1)	
35–39	295 (25.2)	134 (39.5)	161 (19.4)	
40–45	226 (19.3)	117 (34.5)	109 (13.1)	
Race				0.01
Hispanic	148 (12.7)	35 (10.3)	113 (13.6)	
Non-Hispanic White	634 (54.2)	168 (49.6)	466 (56.1)	
Non-Hispanic Black	300 (25.7)	108 (31.9)	192 (23.1)	
Non-Hispanic Other	87 (7.4)	28 (8.3)	59 (7.1)	
Marital Status^b				0.04
Single, never married	203 (17.4)	46 (13.6)	157 (18.9)	
Married or Cohabiting	684 (58.6)	200 (59.0)	484 (58.4)	
Formerly Married	281 (24.1)	93 (27.4)	188 (22.7)	
Education				0.02
High school or some college	561 (48.0)	145 (42.8)	416 (50.1)	
Bachelor's degree or higher	608 (52.0)	194 (57.2)	414 (49.9)	
Income^b				0.27
< \$20,000	222 (19.2)	55 (16.4)	167 (20.4)	
\$20,000–\$59,999	606 (52.5)	185 (55.2)	421 (51.3)	
≥ \$60,000	327 (28.3)	95 (28.4)	232 (28.3)	
Parity				<0.001
0	361 (30.9)	78 (23.0)	283 (34.1)	
1 or 2	618 (52.9)	183 (54.0)	435 (52.4)	
3	190 (16.3)	78 (23.0)	112 (13.5)	
Has additional (non-VA) insurance^b	605 (51.8)	193 (56.9)	412 (49.7)	0.03
Primary care at VA women's clinic				0.60
Yes	541 (46.3)	158 (46.6)	383 (46.1)	
No	501 (42.9)	149 (44.0)	352 (42.4)	
Don't know	127 (10.9)	32 (9.4)	95 (11.5)	
VA PCP is female^b	909 (78.8)	252 (75.2)	657 (80.2)	0.06
Sees VA PCP for almost all care^b	925 (79.9)	278 (82.5)	647 (78.8)	0.16
Sees VA PCP for routine gynecologic care^b	674 (58.6)	188 (56.1)	486 (59.6)	0.28
History of military sexual trauma	609 (52.1)	182 (53.7)	427 (51.5)	0.49
Geographic Census Region				0.15

Variable	n (%)			p-value ^a
	Total n = 1169	1 contraindication to CHC n = 339	No contraindications to CHC n = 830	
Northeast	98 (8.4)	20 (5.9)	78 (9.4)	
Midwest	218 (18.7)	62 (18.3)	156 (18.8)	
South	608 (52.0)	190 (56.1)	418 (50.4)	
West	245 (21.0)	67 (19.8)	178 (21.5)	

CHC, combined hormonal contraception; PCP, primary care provider.

^aBased on χ^2 test.

^bMissing data: Marital status (n=1), income (n=14), insurance (n=1), provider gender (n=15), sees provider for almost all care (n=11), sees provider for gynecologic care (n=18).

Table 2

Contraindications to CHC and contraceptive method use among women Veterans at risk of unintended pregnancy

	Sample N (%)	Contraceptive Method Type			
		n (%) using CHC methods ^a	n (%) using Non-CHC prescription methods ^b	n (%) using Non-prescription methods ^c	n (%) using No method
Medical Contraindications to CHC					
Total	1 169 (100)	258 (22.1)	590 (50.5)	186 (15.9)	135 (11.5)
No Contraindications	830 (71.0)	212 (25.5)	400 (48.2)	133 (16.0)	85 (10.2)
Any Contraindication (1)	339 (29.0)	46 (13.6)	190 (56.1)	53 (15.6)	50 (14.8)
Hypertension	174 (14.9)	25 (14.4)	90 (51.7)	28 (16.1)	31 (17.8)
Migraine with aura or migraine >35 ^d	102 (8.7)	14 (13.7)	69 (67.7)	9 (8.8)	10 (9.8)
Smoker > 35 years old	86 (7.4)	11 (12.8)	46 (53.5)	13 (15.1)	16 (18.6)
Thromboembolism	35 (3.0)	3 (8.6)	21 (60.0)	8 (22.9)	3 (8.6)
Stroke	9 (0.8)	3 (33.3)	5 (55.6)	1 (11.1)	0 (0)
Coronary Artery Disease	4 (0.3)	0 (0)	3 (75.0)	1 (25.0)	0 (0)
Breast Cancer	3 (0.3)	0 (0)	2 (66.7)	0 (0)	1 (33.3)

CHC, combined hormonal contraception

^aCHC methods: pill, patch, ring.

^bNon-CHC prescription methods: IUD, subdermal implant, injection, male or female sterilization.

^cNon-prescription methods: barrier methods, fertility-awareness, withdrawal.

^dMigraine-related contraindications were determined by presence of ICD-9-CM diagnosis codes in VA administrative data: migraine with aura (346.0, 346.3, 346.5, 346.6) within 10 years prior to the study interview or any migraine (346.xx) within 12 months prior to study interview for women 35 years or older. All other conditions were determined via self-report on the survey instrument.

Table 3

Odds of CHC use and method type among women Veterans at risk of unintended pregnancy

Women with contraindications to CHC vs. women without	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI) ^a
Logistic Regression Model^b		
No CHC use	REF	REF
CHC use	0.46 (0.32–0.65)	0.54 (0.37–0.79)
Multinomial Regression Model^c		
CHC use	REF	REF
Non-CHC Prescription	2.19 (1.52–3.15)	1.74 (1.17–2.60)
Non-Prescription	1.84 (1.17–2.88)	1.96 (1.19–3.22)
No Method	2.71 (1.69–4.35)	2.29 (1.35–3.89)

CHC, combined hormonal contraception

^a Adjusted for age, race/ethnicity, marital status, education, parity, insurance status (VA only or dual), and VA PCP gender. n=1152 for adjusted models due to missing data: provider gender (n=15), insurance (n=1), marital status (n=1).

^b Logistic regression model with outcome CHC use vs. no CHC use.

^c Multinomial regression model with 4 levels of contraceptive use: 1) CHC methods: pill, patch, ring (reference group); 2) Non-CHC prescription methods: IUD, implant, injection, male or female sterilization; 3) Non-prescription methods: barrier methods, fertility-awareness, withdrawal; 4) No method.