

GYNECOLOGY

Trends in contraceptive use according to HIV status among privately insured women in the United States

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BACKGROUND: There is limited information on the patterns and trends of contraceptive use among women living with HIV, compared with noninfected women in the United States. Further, little is known about whether antiretroviral therapy correlates with contraceptive use. Such information is needed to help identify potential gaps in care and to enhance unintended pregnancy prevention efforts.

OBJECTIVE: We sought to compare contraceptive method use among HIV-infected and noninfected privately insured women in the United States, and to evaluate the association between antiretroviral therapy use and contraceptive method use.

STUDY DESIGN: We used a large US nationwide health care claims database to identify girls and women ages 15-44 years with prescription drug coverage. We used diagnosis, procedure, and National Drug Codes to assess female sterilization and reversible prescription contraception use in 2008 and 2014 among women continuously enrolled in the database during 2003 through 2008 or 2009 through 2014, respectively. Women with no codes were classified as using no method; these may have included women using nonprescription methods, such as condoms. We calculated prevalence of contraceptive use by HIV infection status, and by use of antiretroviral therapy among those with HIV. We used multivariable polytomous logistic regression to calculate unadjusted and adjusted odds ratios and 95% confidence intervals for female sterilization, long-acting reversible contraception, and short-acting hormonal contraception compared to no method.

RESULTS: While contraceptive use increased among HIV-infected and noninfected women from 2008 through 2014, in both years, a lower proportion of HIV-infected women used prescription contraceptive methods (2008: 17.5%; 2014: 28.9%, compared with noninfected women (2008: 28.8%; 2014: 39.8%, $P < .001$ for both). Controlling for demographics, chronic medical conditions, pregnancy history, and cohort year, HIV-infected women compared to HIV-noninfected women had lower odds of using long-acting reversible contraception (adjusted odds ratio, 0.67; 95% confidence interval, 0.52–0.86 compared to no method) or short-acting hormonal contraception method (adjusted odds ratio, 0.59; 95% confidence interval, 0.50–0.70 compared to no method). In 2014, HIV-infected women using antiretroviral therapy were significantly more likely to use no method (76.8% vs 64.1%), and significantly less likely to use short-acting hormonal contraception (11.0% vs 22.7%) compared to HIV-infected women not using antiretroviral therapy. Those receiving antiretroviral therapy had lower odds of using short-acting hormonal contraception compared to no method (adjusted odds ratio, 0.45; 95% confidence interval, 0.32–0.63). There was no significant difference in female sterilization by HIV status or antiretroviral therapy use.

CONCLUSION: Despite the safety of reversible contraceptives for women with HIV, use of prescription contraception continues to be lower among privately insured HIV-infected women compared to noninfected women, particularly among those receiving antiretroviral therapy.

Key words: antiretroviral therapy, contraception, HIV

Introduction

It is estimated that as of 2014, 25% of people living with HIV in the United States were women.¹ Access to accurate contraceptive method information and a full range of effective options is important for HIV-infected women not only to prevent unintended pregnancy, but also to prevent vertical transmission of HIV.² According to the US Medical Eligibility Criteria for Contraceptive Use (MEC),³ all contraceptive methods are

considered safe or generally safe for use by HIV-infected women.⁴ Further, concern regarding drug interactions may limit providers from recommending hormonal contraceptives. In contrast, the most recent US MEC guidelines do not recommend limiting any contraceptives based on antiretroviral therapy (ART) use. An exception to this recommendation is the infrequently prescribed protease inhibitor fosamprenavir. For women using fosamprenavir, current recommendations state that the risks of combined hormonal contraception outweigh the benefits.³ HIV-infected individuals are encouraged by their providers to use condoms to prevent HIV transmission to uninfected partners. While there is increasing use of effective prescription contraceptive methods in the general population,⁵

specifically long-acting reversible contraceptives (LARC) (which include intrauterine devices [IUDs] and implants), some data suggested that women with HIV are more likely to use less effective contraceptive options such as condoms.⁶ High rates of female sterilization⁷ and reduced overall pregnancy rates during early stages of the HIV epidemic may not have continued. Among women with HIV, ART use has increased due to efforts to improve access to testing and ART and guidelines suggesting earlier initiation of ART.⁸⁻¹⁰ Due to increasing ART use, improved health outcomes, and the lower perceived HIV transmissibility associated with viral load suppression, the trends in contraceptive use among HIV-infected women may be becoming more similar to those among noninfected women.

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Our aim was to evaluate prescription contraceptive use among HIV-infected women compared to noninfected women in the United States in 2008 and 2014. Specifically, we aimed to examine differences in the pattern of prescription contraceptive methods based on HIV infection status and to explore the impact of ART use on contraceptive method use. This information will provide contemporary contraceptive trends and explore the associations between HIV and ART use and contraceptive practice patterns.

Materials and Methods

We analyzed data from the Truven Health MarketScan Commercial Claims and Encounters databases. These databases consist of a large convenience sample of individuals with employer-based health insurance and include individual-level health care claims information from employer health plans with both inpatient and outpatient diagnoses and procedure codes and links to filled outpatient prescription drug claims. All claims for a particular individual can be linked even if the employer changes insurance plans, but may not be linked if the individual changes employment. The average number of female enrollees in the database is approximately 11.4 million per year in years 2003 through 2008 and approximately 24 million per year in years 2009 through 2014. These databases undergo quality assessments to maintain validity of the data.¹¹ As the databases are deidentified, the institutional review board of the Centers for Disease Control and Prevention determined that this was not human subjects research.

We evaluated 2 cohorts of women to determine contraceptive use for index years 2008 and 2014. For each index year, we included women continuously enrolled for 5 years prior, to account for previously initiated LARC methods or sterilization. Specifically, for 2008, we included women continuously enrolled from 2003 through 2008; for 2014, we included women continuously enrolled from 2009 through 2014. Girls and women were included if they were ages 15-44 years and had health plans with

prescription drug coverage. We excluded women who had a prior diagnostic or procedure code for hysterectomy from the analysis of contraceptive method use. Notably any women with a hysterectomy code identified in the 2003 through 2008 period, thus excluded in 2008, were also excluded from the 2014 cohort. To identify the exposures, outcomes, and covariates, such as pregnancy and chronic medical conditions, we used *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* and *Current Procedural Terminology* codes (see Appendix for specific coding for conditions and medications).

Our primary exposures of interest were HIV infection status and ART use (among HIV-infected women). HIV infection was defined by meeting 1 of the following 4 criteria: (1) 2 outpatient visits with HIV diagnosis codes separated by ≥ 30 days; (2) 1 outpatient diagnosis code for HIV and at least 1 antiretroviral drug (see list in Appendix of ART medications considered; medications typically used for preexposure or postexposure prophylaxis without concomitant other ART medication were excluded); (3) 2 pharmacy charges for at least 1 ART separated by ≥ 30 days; or (4) 1 inpatient stay with HIV diagnosis code. We defined HIV-infected women as ART users if they filled at least 1 prescription for ART (drug names listed in Appendix) during the 6 years of the cohort.

Our primary outcome of interest was female sterilization or reversible prescription contraceptive use during the index year. This was identified from inpatient, outpatient, and pharmaceutical databases using *ICD-9-CM* diagnosis and procedure codes, Healthcare Common Procedure Coding System supply codes, *Current Procedural Terminology* codes, and the US Food and Drug Administration National Drug Codes. We considered prescriptions to be a proxy measure for actual use. Contraceptive methods examined included female sterilization and reversible prescription methods such as IUDs, implants, injectables, pills, patches, and rings. A woman was identified as sterilized if a sterilization code was present in

the inpatient or outpatient databases in the 6 years of the cohort. A woman was considered to be an IUD user during the index year if the method was placed based on a procedure code or supply code from the inpatient or outpatient databases during that index year or within the 5 years prior without a removal code noted. A woman was considered to be an implant user during the index year if the method was placed based on a procedure code or supply code from the inpatient or outpatient databases during that index year or within 3 years prior without a removal code noted. We searched for codes in the index year indicating injectable, pill, patch, or ring use. These methods needed to be identified at least once during the index year to be considered as use during that year. Injectable use was identified from inpatient and outpatient claims if there was a depot medroxyprogesterone acetate supply code or a family planning encounter diagnosis code coupled with a generic injection procedure code. Use of oral contraceptive pills (including combined and progestin-only pills), combination hormonal patches, or combination vaginal rings was identified by National Drug Codes in the pharmaceutical databases. If there were no sterilization or contraceptive codes identified, the individual was classified as using no method. Individuals classified as using no method may have been using nonprescription methods such as condoms. We used a method of hierarchical classification to determine the most effective method of contraceptive used similar to one previously described.⁷ We collapsed the methods into 4 categories to evaluate trends in method use: (1) female sterilization; (2) LARC method (IUDs and implants); (3) short-acting hormonal contraception (SAHC), including shorter-acting prescription methods (injectable, pills, patch, or ring); and (4) no prescription method.

For covariates, we included age (3 categories: 15-24, 25-35, 36-44 years), region in the United States (defined as the following 5 categories by Truven Health: Northeast, North Central, South, West, unknown), chronic

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