GYNECOLOGY

Complications and continuation rates associated with 2 types of long-acting contraception

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OBJECTIVE: We sought to compare complication and continuation rates of the levonorgestrel intrauterine system (LNG-IUS) with the subdermal etonogestrel (ENG) implant across the United States among girls and women 15-44 years of age.

STUDY DESIGN: A retrospective study of health insurance claims records from 2007 through 2011 identified a cohort of women who had LNG-IUS (n = 79,920) or ENG implants (n = 7374) inserted and had insurance coverage for 12 months postinsertion. Claims for complications were examined 12 months after insertion, or until removal of either device within each of 3 age groups.

RESULTS: After its introduction in 2007, the frequency of ENG implants increased each year and almost a third of all insertions were in teenagers. However, among women ≤24 years old who had delivered an infant in the prior 8 weeks, a LNG-IUS was more likely to be inserted than an ENG implant ($P < .05$). The most frequent complications with both methods were related to abnormal menstruation, which was more likely to occur among ENG implant users. Overall, 83-88% of the entire sample used their chosen method for at least 12 months. The odds of continuation were similar for both methods among teenagers, but ENG implants were more likely to be removed prematurely among women 20-24 years old (odds ratio, 1.21; 95% confidence interval, 1.06—1.39) and 25-44 years old (odds ratio, 1.49; 95% confidence interval, 1.35—1.64).

CONCLUSION: Both of these long-acting contraceptive methods are well tolerated among women of all ages, and demonstrate high continuation rates.

Key words: etonogestrel implant, intrauterine device, levonorgestrel intrauterine systems, long-acting reversible contraception

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During 2008, >50% of all pregnancies in the United States were unplanned.[1] This high rate of unintended pregnancies could be significantly reduced through increased use of highly effective long-acting reversible contraception (LARC), such as subdermal etonogestrel (ENG) implants and intrauterine devices (IUDs). The ENG implant has a failure rate approaching 0% while the levonorgestrel intrauterine system (LNG-IUS) has a low failure rate of 0.2% over the course of 1 year.[2,3] In spite of its demonstrated high efficacy, relatively few women in the United States are prescribed LARC each year.[4] Although increasing in recent years, only 5% of sexually active adolescent and young women reported using IUDs from 2002 through 2010.[4] In 2009, <1% of US women using contraceptives reported using ENG implants, although this may be due to the limited time they had been available.[5] As a result of LARC's meager use, most women of reproductive age who desire contraception are still prescribed less effective methods.

One reason for the low rate of LARC utilization may be concerns that it has side effects or increases the risk of pelvic inflammatory disease (PID). For example, ENG users often experience

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irregular or frequent bleeding.[6] Moreover, concerns about future fertility appear to be the reason that providers infrequently recommend IUDs,[7] even though the American Congress of Obstetricians and Gynecologists states that IUDs are safe to use in teens and nulliparous women. As a result of these concerns, more than half of US health practitioners provide IUDs rarely or never to nulliparous women or teenagers.[4,8] Two recent studies partially addressed these concerns by demonstrating that PID, uterine perforation, and ectopic pregnancies occur infrequently (<1%) during the first year of use among women using modern IUDs.[9,10] These studies did not, however, directly compare side effects of the ENG implant with LNG-IUS using age-stratified analyses.[11] As one Cochrane review pointed out, these types of comparisons are important to help providers counsel their patients on the best type of LARC for them.[2]

Finally, it is important to understand how long women continue to use different LARC methods. Prior studies have shown that LARC is used significantly longer than oral contraceptive pills, patches, rings, or barrier methods, and satisfaction with LNG-IUS and the ENG implant is high.[12,13] However, these research studies were conducted in populations that may differ from the general population. Further, these studies did not directly compare continuation rates between different LARC methods within different age groups, but instead assessed continuation of each method separately. The objective of this study was to compare 2 different methods of LARC (LNG-IUS vs ENG implant) by examining: (1) relative use trends over time, (2) complication rates, and (3) continuation rates among teenagers 14-19 years of age vs women 20-24 years and 25-44 years of age.

Materials and Methods

This retrospective cohort study used 2007 through 2011 health insurance claims from Clinformatics DataMart (OptumInsight Life Sciences Inc, Eden Prairie, MN). The data set contains information on >45 million individuals, of which approximately 80% purchase their health insurance through their employer. The dataset has been deidentified and does not contain any information on socioeconomic status or race/ethnicity. In general, this dataset is roughly representative of the US working population, with some overrepresentation in the South. Data reflect only health claims that have been paid by the insurance company, based on submissions from doctors across the United States. This study was exempted from full review by the University of Texas Medical Branch Institutional Review Board.

For our study, we included only the LNG-IUS and the ENG implant LARC devices to directly compare these methods. We did not include the copper IUD because it is used rarely among teenagers, and the continuation and side effects of this method have already been compared to the LNG-IUS in different age groups.[9] We identified 131,634 girls and women between 15-44 years of age who had a claim for the insertion of a LNG-IUS and 12,381 for an ENG implant from 2007 through 2011, with 1 year of follow-up. Including follow-up time, our results extended into 2012. Subjects were chosen if they had a Healthcare Common Procedure Coding System code (J7302, S4989, S4981) combined with either a *Current Procedural Terminology* (*CPT*) code (58300) or *International Classification of Diseases, Ninth Revision* (*ICD-9*) code (69.7, V25.1, V25.42) that indicated insertion of the LNG-IUS. Insertion of the ENG implant device was determined by a Healthcare Common Procedure Coding System code (J7307).

Of all women who had a LNG-IUS inserted during 2007 through 2011, a total of 79,920 were included in the study after excluding those who were immunocompromised (042, 043, 044, 279.0, 279.1, 279.2, 279.3, 795.71, V08), autistic or mentally impaired (299, 299.0, 299.00, 299.01, 317, 318), and not enrolled for 12 continuous months from the date of LARC insertion (Appendix; Supplementary Figure). After applying the same criteria, 7374 women who had the ENG implant device inserted were included in the study. Mean age of included LNG-IUS users was 31.6 ± 6.3 years compared to 32.1 ± 8.3 years among the excluded. Mean age of ENG implant users was 24.1 ± 6.9 years compared to 24.6 ± 7.4 years among the excluded.

Other data included in this study were year of birth, year of device insertion, type of provider, removal, and whether it was inserted within 8 weeks of childbirth. To determine age at insertion, birth year was subtracted from year of LARC insertion. Provider specialties were categorized and included: obstetricians/gynecologists, pediatricians, family practitioner/internal medicine/general practitioners, clinics, nonphysician providers, and specialists. The specialist category includes physicians with specialties that do not fit the other categories. In the absence of a code, providers were categorized as "unknown" because it was not known if the provider was a physician or a nonphysician provider.

Claims for LNG-IUS or ENG implant insertion within 8 weeks of delivery were examined by age group. Complication claims and removal of the device were examined across the 12 months following device insertion. Claims for complications were only examined until removal of either LARC method. Complications included: pain associated with female genital organs (dyspareunia, dysmenorrhea, or premenstrual tension), disorders of menstruation (excessive menstruation, dysfunctional or functional uterine hemorrhage, postcoital bleeding, endometrial hyperplasia, metrorrhagia, irregular menstrual cycles, absence of menstruation, scanty or infrequent menstruation), and inflammation/infection (PID, including inflammatory diseases of the ovary, fallopian tube, pelvic cellular tissue, and peritoneum; and inflammatory disease of the uterus except cervix; cervicitis and endocervicitis; and cystitis). The frequency of normal intrauterine pregnancy and abnormal pregnancy (ectopic pregnancy and molar pregnancy/abnormal products of conception/missed or spontaneous abortion) that