GYNECOLOGY

Long-term utilization and continuation of intrauterine devices

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OBJECTIVE: We compared the 48 and 60 month continuation rates of levonorgestrel (LNG) and copper (Cu) intrauterine devices (IUDs) among women enrolled in the Contraceptive CHOICE Project (CHOICE). Our primary outcome was continuation at 48 months.

STUDY DESIGN: This is a prospective cohort study of women who received an IUD through CHOICE. We randomly selected women who had either LNG or Cu IUDs inserted between January 2008 and June 2009 and contacted them by telephone. Once contacted and consented, they were asked whether they were still using their IUD. Women who reported discontinuation of the IUD were asked for the reasons and subsequent contraceptive use. Survival analysis using Cox proportional hazards was performed to assess for factors associated with discontinuation and to calculate hazard ratios.

RESULTS: Of the 460 women we attempted to contact, 321 (70%) were reached for interviews. Continuation data on the remaining 139 women were available from CHOICE and its substudies. Continuations at 48 and 60 months were 62.3% and 51.7% for LNG IUD and 64.2% and 55.9% for the Cu IUD, respectively. Continuation at 48 months was highest among women older than 29 years of age at insertion (LNG IUD, 72.5%; Cu IUD, 77.1%). Women younger than 24 years of age had the lowest 48 month continuation (LNG IUD, 55.4%, and Cu IUD, 53.2%). In univariable and multivariable analysis, demographic characteristics, menstrual profile, and pregnancy history were not associated with discontinuation. Age older than 29 years was associated with less discontinuation than those 24—29 years of age (hazard ratio, 0.67, 95% confidence interval, 0.47—0.96).

CONCLUSION: IUD continuation remains high (> 60%) at 48 months with no difference between Cu and LNG IUDs.

Key words: continuation, intrauterine device, long-term, long-acting reversible contraceptive

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The unintended pregnancy rate in the United States is among the highest in the developed world.[1] Highly effective, long-acting reversible contraceptive (LARC) methods have the potential to decrease unintended pregnancies and reduce health disparities. As was shown in the Contraceptive CHOICE Project (CHOICE), women who use short-acting contraceptives have a 20-fold increase in unintended pregnancy as compared with those using LARCs.[2] CHOICE also demonstrated that high rates of LARC uptake are associated with a reduction in teen pregnancy.[3]

In the last decade, the use of LARC methods has increased, and now approximately 10% of contracepting women use intrauterine devices (IUDs).[4] There are limited data on the long-term continuation of IUDs in the United States because most studies focus on 12 month continuation.[2,5-7]

The 5 year prospective study conducted by Sivin et al[8] randomized parous women from multiple countries to copper- or levonorgestrel-containing IUDs. The copper-containing IUD (Cu-IUD) has been associated with short-term increases in bleeding and cramping, whereas the levonorgestrel-containing IUD (LNG-IUD) generally

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makes cramping and bleeding lighter.[9,10] The Long-Term Utilization and Continuation of Intrauterine Devices (LUCID) study sought to describe continuation of the LNG- and Cu-IUD at 48 and 60 months. Given the improved bleeding profile associated with the LNG-IUD, our hypothesis was that women choosing the LNG-IUD would have higher long-term continuation than those using the Cu-IUD at 48 months.

Materials and Methods

The LUCID study is a prospective cohort study of women who participated in CHOICE and received an IUD. CHOICE was a longitudinal, observational study that offered women in the St Louis area contraceptives of their choice without cost. The goal of CHOICE was to decrease the unintended pregnancy rate at a regional level by emphasizing the most effective methods of contraception and by eliminating the barrier of cost. The methods of CHOICE have been described previously.[11]

This study was approved by the Human Research Protection Office at Washington University in St Louis.

The primary outcome of this study was the continuation of IUDs at 48 months; the secondary outcome was the continuation at 60 months. To determine long-term use of IUDs, we included any CHOICE participant aged 14–45 years at the time of the IUD insertion who received the IUD though CHOICE between Jan. 1, 2008, and June 30, 2009. This time frame was chosen because it would allow participants to be contacted approximately 60 months after the IUD insertion.

A random sampling of women who had an IUD inserted during this period was generated. Thus, women who both continued and who discontinued their IUDs during CHOICE would be included in the sample. We excluded the following women: (1) participated in CHOICE but did not consent to future studies (< 5% CHOICE participants); or (2) refused to give informed consent.

CHOICE participants provided multiple methods of contact including home and mobile phone numbers, e-mail addresses, a physical address, and updated contact information from hospital records as well as contact information of friends and family that could be used by the study team for follow-up.

Participants were followed up for 2–3 years, with telephone surveys at 3 and 6 months after enrollment and every 6 months thereafter. For this substudy, potential participants were attempted to be reached using the following contact algorithm: they were called during a weekday morning, a weekday afternoon, a weekday evening, and during a weekend day; an e-mail was sent to any addresses provided during CHOICE participation; and finally, a letter was sent to their home address. Attempts were made to reach participants' alternate contacts as well when necessary.

Data were collected using a telephone-based survey once consented for participation in this study. Women were asked whether they were still using the IUD they had received through CHOICE. If they had discontinued, they were asked to recall the date it was removed and the reason for discontinuation. When a participant could recall the removal year and month but not the date, the date was imputed randomly. When they could recall the year but not month, then the month and date were imputed randomly.

In many cases, the actual removal date was available through the CHOICE clinical data. When there was a discrepancy between the self-reported removal date and the available clinical data, the date available from the medical record was used.

Study data were entered by the primary investigator (J.T.D.) and trained research assistants directly into the REDCap electronic data capture tools hosted at Washington University in St Louis.[12]

We used frequencies, percentages, means, and SDs to describe the demographic and reproductive characteristics of the study participants. A χ^2 test was performed for categorical data and a Student t test was performed for continuous data. The Kaplan-Meier survival function was used to estimate the continuation rates for the 2 IUD types at 48 and 60 months after insertion. A Cox proportional hazard model was used to estimate hazard ratios (HRs) of variables associated with discontinuation. The last point of contact in CHOICE was used as the endpoint for those who could not be contacted for status of method use.

Participants were censored if their IUD was removed because of a pregnancy or an attempted pregnancy. They were also censored at 60 months if they had their IUD removed at that time. If a patient presented with a partial expulsion of her IUD and it was removed and a new one placed during that month, this was not considered a discontinuation. Tests for collinearity were performed between variables in the final model.

Confounders were identified as variables that changed HRs by more than 10% when included in the model. Confounding variables were then included in the final multivariable analysis. An alpha level was set to 0.05 for all statistics.

Analyses were performed using Stata version 13 (StataCorp, College Station, TX). We made the following assumptions in determining our sample size: 50% continuation of LNG-IUD at 48 months and 35% continuation of Cu-IUD at 48 months. We also assumed that we would be unable to contact 20% of potentially eligible participants. To detect a 15% difference in groups with an 80% power and an alpha of 0.05, we would need 230 participants in each group for a total of 460 participants.

Results

Of the 1,925 women who had IUDs placed in CHOICE between January 2008 and June 2009, 460 were selected randomly for participation. We were able to contact 321 women in this group. All except 6 (98%) agreed to participate in the survey. Of the 139 who could not be reached, 58 had enrolled in substudies of CHOICE; therefore, their IUD continuation status was known. The remaining 81 participants were censored at their last point of contact in CHOICE to supplement the data