GYNECOLOGY

Anticipated pain as a predictor of discomfort with intrauterine device placement

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BACKGROUND: Intrauterine devices have been gaining popularity for the past 2 decades. Current data report that >10% of women who use contraception are using an intrauterine device. With <1% failure rates, the intrauterine device is 1 of the most effective forms of long-acting reversible contraception, yet evidence shows that fear of pain during intrauterine device placement deters women from choosing an intrauterine device as their contraceptive method.

OBJECTIVES: The objective of this analysis was to estimate the association between anticipated pain with intrauterine device placement and experienced pain. We also assessed other factors associated with increased discomfort during intrauterine device placement. We hypothesized that patients with higher levels of anticipated pain would report a higher level of discomfort during placement.

STUDY DESIGN: We performed a secondary analysis of the Contraceptive CHOICE Project. There were 9256 patients were enrolled in Contraceptive CHOICE Project from the St. Louis region from 2007–2011; data for 1149 subjects who came for their first placement of either the original 52-mg levonorgestrel intrauterine system or the copper intrauterine device were analyzed in this study. Patients were asked to report their anticipated pain before intrauterine device placement and experienced pain during placement on a 10-point visual analog scale. We assessed the association of anticipated pain and patient demographic and reproductive characteristics and intrauterine device type with experienced pain with intrauterine device placement.

RESULTS: The mean age of Contraceptive CHOICE Project participants in this subanalysis was 26 years. Of these 1149 study subjects, 44% were black, and 53% were of low socioeconomic status. The median expected pain score was 5 for both the levonorgestrel intrauterine system and the copper intrauterine device; the median experienced pain score was 5 for the levonorgestrel intrauterine system and 4 for the copper intrauterine device. After we controlled for parity, history of dysmenorrhea, and type of intrauterine device, patient anticipated pain was associated with increased experienced pain (adjusted relative risk for 1 unit increase in anticipated pain, 1.19; 95% confidence interval, 1.14–1.25). Nulliparity, history of dysmenorrhea, and the hormonal intrauterine device (compared with copper) also were associated with increased pain with intrauterine device placement.

CONCLUSION: High levels of anticipated pain correlated with high levels of experienced pain during intrauterine device placement. Nulliparity and a history of dysmenorrhea were also associated with greater discomfort during placement. This information may help guide and treat patients as they consider intrauterine device placement. Future research should focus on interventions to reduce preprocedural anxiety and anticipated pain potentially to decrease discomfort with intrauterine device placement.

Key words: anticipated pain, discomfort, dysmenorrhea, nulliparity, pain, placement

Intrauterine devices (IUDs), including the copper (TCu830A) and the hormonal IUD (levonorgestrel intrauterine system [LNG-IUS]), are 2 of the most effective forms of reversible contraception available; failure rates are <1% for both perfect and typical use.[1] Multiple studies have demonstrated high levels of acceptability of IUDs and continuation rates at 2–3 years are in the range of 67–77%.[2,3] In fact, continuation rates for IUDs are higher than those for shorter-acting reversible contraceptive methods, such as the pill, ring, contraceptive patch, or depo-medroxyprogesterone acetate.[3] The rate of use of IUDs in the United States has increased steadily in the last 2 decades. The most recently published data demonstrates 10.3% of contracepting women aged 15–44 years are using an IUD.[4] Although the IUD is highly effective and acceptable, qualitative and anecdotal evidence has suggested that perceived pain with placement may be a barrier to the use of intrauterine contraception.[5]

Few small studies have been published that have evaluated predictors of increased pain with IUD placement, and results have been inconsistent. Factors that have been associated with more significant pain at the time of IUD placement include nulliparity[6-9] or no previous vaginal delivery,[10] age >30 years,[8] a longer interval since last pregnancy or menses,[7,8] a history of dysmenorrhea,[6,11] absence of current breastfeeding,[7,8] and higher educational achievement.[7] Additionally, higher anxiety preceding the procedure or higher expected pain with placement has been associated with greater pain at the time of placement.[10,12-14] Explaining the pros and cons of IUDs, guidance on what to expect during and after the procedure, and the suggestion of coping mechanisms like distraction techniques before placement have been proposed as methods to decrease pain with placement.[15]

The purpose of this secondary analysis was to describe the pain or discomfort experienced with IUD placement and to assess whether anticipated or expected pain is associated with discomfort experienced with placement. We also sought to evaluate the association of demographic or psychological factors with increased pain with placement. Our

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specific hypothesis was that subjects with higher levels of anticipated pain with placement would score higher on our scale of reported discomfort with placement.

Materials and Methods

We performed a secondary analysis of the women who underwent IUD placement in the Contraceptive CHOICE Project (CHOICE). CHOICE was a prospective cohort study that educated all participants about contraceptive methods, including the most effective methods (IUDs and the contraceptive implant). CHOICE reduced access obstacles to contraception and provided all methods at no cost. The goal of the study was to reduce the unintended pregnancy rate in the St. Louis, MO, region.[3] The methods of CHOICE have been described previously in this Journal[16]; we will briefly outline the substudy methods here.

CHOICE project participants were 14−45 years old and were enrolled between August 2007 and September 2011. Inclusion criteria for CHOICE were as follows: (1) sexually active or planning to become sexually active with a male partner within the next 6 months, (2) willing to begin using or switch to a new reversible method of contraception, and (3) English or Spanish speaking. If individuals wanted to conceive in the next 12 months or had undergone a hysterectomy or sterilization procedure, they were not eligible to participate in CHOICE. Participants were eligible for this secondary analysis if they chose an IUD (the original 52-mg LNG IUS [Bayer, Whippany, NJ] or copper) for their contraceptive method and had their expected and experienced pain assessed at the placement visit (questions regarding pain with placement were added November 2010). Our analysis included each participant once. If a woman had multiple IUD placements during her participation in CHOICE, only the first CHOICE placement was included in the dataset. We did not exclude women who had previously had an IUD before CHOICE enrollment. The Washington University in St. Louis institutional review board approved the study protocol, and all participants provided written informed consent.

All subjects were asked to complete a baseline questionnaire. We collected comprehensive demographic and reproductive data and information regarding sexual activity, medical history, and surgical history. At the baseline interview, women were asked "During the past 12 months, on average, how often did you have pain or cramping during your period?" Women were categorized as having a history of dysmenorrhea if they answered "often" or "always"; participants who responded "sometimes" or "never" were considered our referent group. Patients were considered to have a history of depression and/or anxiety if they provided an affirmative response to the question, "Have you ever had depression/anxiety?"

In CHOICE, many different providers (eg, nurse practitioners, residents, fellows, and attending physicians) inserted IUDs; however, most procedures (>80%) were done by nurse practitioners. In the few minutes before placement of their chosen IUD, women were asked to describe the pain they anticipated to experience with the IUD placement on a 10-point visual analog scale (VAS). In the few minutes after placement, participants were asked to rate their actual experienced pain on the same scale. This information was collected by the same provider who placed the IUD and was recorded along with the type of IUD that was placed.

The primary outcome of this study was the patients' score of the level of actual pain that she experienced during the IUD placement. Pain experienced during the IUD placement was analyzed 2 ways: (1) as a continuous variable and (2) dichotomized into experienced pain <7 (low pain score) vs ≥7 (high pain score). We chose a value of 7 on the pain scale as a clinically meaningful value that would be understandable to providers who would be interpreting these data for clinical use.

We considered a participant to be of "low socioeconomic status" if they answered "yes" to either of the following questions: "Do you currently receive food stamps, WIC, welfare, and/or unemployment?" or "During the past 12 months, have you had trouble paying for transportation, housing, health care, medical care or medications, and/or food?" We did not use household income in our definition, because many adolescents were cohabitating with parents or guardians and could not provide accurate household income data.

Patient characteristics were summarized with the use of mean and standard deviation, median and range, or frequency and percentage, depending on data type. Student *t* test or chi-square test was used to compare the patient characteristics between 2 IUD types. Our primary exposure variable in this analysis was anticipated pain with IUD placement. When experienced pain was treated as a continuous variable, linear regression models were used to estimate the change in experienced pain with placement. When experienced pain was treated as a dichotomized variable, Poisson regression models with robust variance were used to estimate the relative risk for high pain. Demographic and reproductive characteristics and IUD type were evaluated for potential confounding effect in the association between anticipated and experienced pain. *Confounding* was defined as a >10% relative change in the association between anticipated and experienced pain with or without the potential confounding covariate in the model. Confounders were included in the final multivariable model. All the statistical analyses were performed using Stata software (version 11; Stata Corporation, College Station, TX). The significance level (alpha) was set at .05.

Results

Of the 9256 CHOICE participants, there were 4302 IUD placements. Of these placements, we collected information regarding anticipated and experienced pain in 1208 participants. Once we excluded multiple IUD placements, 1149 IUD first placements remained in our dataset.

Table 1 provides the demographic, [T1] reproductive, and other patient characteristics of our study sample. The mean age was 26.1 years. Women who chose an

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