Original Study

Use of the Levonorgestrel Intrauterine System in Adolescents with Endometriosis

Jennie Yoost MD [1,*], A. Scott LaJoie PhD, MSPH [2], Paige Hertweck MD [1], Meredith Loveless MD [1]

[1] Kosair Children's Hospital, Louisville, KY
[2] University of Louisville, School of Public Health and Information Sciences, Louisville, KY 40292

A B S T R A C T

Study Objective: The purpose of this study was to evaluate our adolescent patient population who had received a levonorgestrel intrauterine system (LNG-IUS) at or after the time of endometriosis diagnosis, and determine efficacy of the LNG-IUS in regards to pain and bleeding on follow-up exam.
Design: Retrospective cohort study.
Setting: Pediatric Adolescent Gynecology Clinic and Children's Hospital in a metropolitan area.
Participants: Adolescent patients age 14–22 with pathology-proven endometriosis who had the LNG-IUS placed during the course of their treatment for this disease. Patients were divided into LNG-IUS placement at the time of surgical diagnosis versus placement some time after diagnosis.
Main Outcome Measures: Pain and bleeding were assessed by follow-up exam. Pain was classified at each follow-up visit as either none, minimal, moderate, or severe. Bleeding was classified as none, irregular spotting, irregular bleeding, or daily bleeding.
Results: The majority of patients (67%) required additional hormonal therapy for pain and bleeding suppression. Time to bleeding suppression and pain suppression was sooner in the group with interval time between surgical diagnosis and LNG-IUS placement, compared to LNG-IUS placement at the time of surgery (2.4 months vs 5.3 months until bleeding suppression, and 3.8 months vs 4.8 months until pain suppression), although statistical significance was not achieved.
Conclusions: The LNG-IUS is an option for treatment of endometriosis in adolescents. As pain is the main problem associated with endometriosis, LNG-IUS placement is beneficial at the time of surgery when it is diagnosed. A prospective study is needed for further assessment of outcomes.
Key Words: Levonorgestrel intrauterine system, Endometriosis, Adolescents, Pelvic pain

Introduction

Endometriosis is a cause of pelvic pain that can affect adolescents. While most research has been focused on the treatment of this disease in adults, the incidence of endometriosis among adolescents with pelvic pain is estimated at 25%-38%.[1] In adolescents refractory to medical treatment for pelvic pain, endometriosis is found in 67% of cases at laparoscopy.[2] The treatment of endometriosis in adolescents has been extrapolated from adult literature, and medical management is the initial approach. Common medications used for treatment include nonsteroidal anti-inflammatory drugs, gonadotropin releasing hormone agonists (GnRHa), combined oral contraceptive pills (COCs), and progestins. These medications require regular administration and often have side effects that result in decreased compliance, and thus decreased overall efficacy.

The levonorgestrel-releasing intrauterine system (LNG-IUS) has been evaluated as a promising treatment for endometriosis.[3–9] This method delivers levonorgestrel to the uterine cavity at a steady rate of 20 μg/day over 5 years. The levonorgestrel causes atrophy and pseudodecidualization of the uterine lining, along with apoptosis of endometrial glands and stroma.[10,11] As the LNG-IUS does not require repeat administration, patient compliance can be improved.

Pilot studies have shown improved control of chronic pelvic pain and dyspareunia in women with endometriosis,[3,12] and in women with dysmenorrhea associated with rectovaginal endometriosis.[4] Lockhart showed an improvement in endometriosis staging on subsequent laparoscopy in 30.8% of patients after treatment with LNG-IUS for 6 months,[5] and furthermore, that pain and bleeding decreased after 36 months of follow-up.[6]

Recent studies have randomized women with endometriosis to either LNG-IUS or GnRHa[7,8] or expectant management postoperatively.[9] Petta followed 82 women with histologically confirmed endometriosis randomized to either LNG-IUS or 6 months of GnRHa, using a visual analog scale (VAS) for pain assessment. At the end of 6 months both treatments were found to be effective in controlling pelvic pain.[7] Women, however, randomized to LNG-IUS had a continuation rate of 59% at 36 months, and 82% of these women reported a lower pain score compared to GnRHa.[13] Another study randomized forty women within 3 days of diagnostic laparoscopy for endometriosis to either LNG-IUS

Funding: This project received no funding.
The authors indicate no conflicts of interest.
* *Address correspondence to:* Jennie Yoost, MD, Kosair Children's Gynecology Specialists, 210 East Gray St, Louisville, KY 40202; Phone: (502) 629-3730
E-mail address: jlyoost@gmail.com (J. Yoost).

1083-3188/$ - see front matter
http://dx.doi.org/10.1016/j.jpag.2012.11.002

or GnRHa. At the end of 1 year, although there was no statistical significance between the 2 groups, both groups showed a decrease in VAS scores and total endometriosis severity profile scores.[8] A double blind study, comparing postoperative LNG-IUS to expectant management, showed decreased dysmenorrhea in the LNG-IUS group, and longer time to pain recurrence in this group compared to expectant management.[9]

The use of the LNG-IUS in adolescents has been demonstrated to be safe and acceptable.[14] Despite this, all studies mentioned thus far did not include adolescent patients, and often excluded those under 18 years of age. Our unique pediatric and adolescent gynecology clinic serves only pediatric and adolescent patients ages birth to 24. The goal of our study was to evaluate our adolescent patients that had received the LNG-IUS for treatment of endometriosis and evaluate their outcomes of pain and bleeding after insertion.

Materials and Methods

This study was a retrospective chart review of adolescent patients with endometriosis who had a LNG-IUS placed for treatment during the time period of October 2009 through June of 2011. Diagnosis of endometriosis was defined as the presence of endometrial glands or stroma on pathology specimen. All patients had chronic pelvic pain and underwent diagnostic laparoscopy and biopsy of pelvic peritoneum, so that the diagnosis of endometriosis could be confirmed by pathology. The use of saline irrigation in the pelvis as described by Laufer was used to assist in identifying endometriosis lesions.[15] Using this technique, the pelvis was filled with saline using a suction irrigator, and the camera was submerged under water. The surface of the peritoneum was inspected under water which assisted in the identification of early stage clear vesicular lesions. Patients were excluded from review if pathology did not show evidence of endometriosis.

Type of preoperative hormonal medication in the form of combination oral contraceptive pills, patch or ring, oral progestin, or depomedroxyprogesterone injection was recorded, along with duration of use for each patient. Similarly, post-surgical medication type and duration was recorded, along with hormonal medication used in conjunction with the LNG-IUS to control pain and bleeding. Using LNG-IUS insertion as a start date, follow-up visits after LNG-IUS insertion were reviewed for the presence of persistent pain and bleeding. Pain was classified at each follow-up visit as either none, minimal, moderate or severe. Bleeding was classified as none, irregular spotting, irregular bleeding, or daily bleeding. Using LNG-IUS insertion as a start date, length of follow-up was also determined. Two main groups were identified: those that had the LNG-IUS placed at the time of surgical diagnosis (Group 1), and those who had the LNG-IUS placed at some time during the course of their treatment (Group 2). Figure 1 illustrates the 2 groups along with treatment periods. Analysis of variance was used to calculate the difference between population means in regards to time to pain and bleeding resolution from the time of LNG-IUS insertion.

Results

Eighteen patients were identified with pathology proven endometriosis with LNG-IUS placed as part of their treatment. The mean age at LNG-IUS placement was 15.9 years with a range of 14–22, but 15 of 18 patients (83%) were under the age of 18 at the time of LNG-IUS placement. Past medical history was significant for musculoskeletal pain (83%), constipation (39%), and family history of endometriosis (50%). One patient had interstitial cystitis along with endometriosis. In addition to diagnostic laparoscopy with peritoneal biopsy, 4 patients had cystoscopy with hydrodistention because of concomitant bladder symptoms. Five patients had appendectomy during the diagnostic procedure due to persistent chronic pelvic pain and multiple emergency room visits. In all 5 cases, the appendix was normal on pathology and not felt to be the cause of pelvic pain.

Seventeen patients had stage I endometriosis and 1 patient had stage II endometriosis. The LNG-IUS was placed at time of diagnostic procedure in 8 patients (Group 1), and the remaining 10 patients had the LNG-IUS placed at some time after diagnosis (Group 2). In the latter group, the time from diagnosis to LNG-IUS placement ranged from 6 months to 6 years with mean of 25.6 months (SD 21.8). Preoperative hormonal therapy was used in all patients in both groups except for 1 patient. The length of preoperative hormonal therapy before surgical diagnosis ranged from 1–88 months, with a mean of 21.3 months. Preoperative hormonal therapy was in the form of COC, patch, ring, oral progestin, or depomedroxyprogesterone acetate injection. No patient received preoperative GnRH anaologue.

Group 1 comprised 8 patients that had the LNG-IUS placed at the time of diagnosis of endometriosis. In this group all but 1 patient required additional hormonal medications for pain or bleeding suppression. Two patients required GnRHa (one for 3 months, and the other for 6 months) with daily norethindrone. The remaining 5 patients used hormonal therapy in the form of a COC or progestin containing pill for a range of 2–12 months (mean of 6.6 months) as shown in Figure 2. The length of follow-up ranged from 3–24 months (mean of 8.5 months). The treatment course is summarized in Table 1. Time until bleeding cessation was range of 1–13 months (mean of 5.3 months, SD 5.06) in 6 patients, with the remaining 2 patients having irregular spotting at the last visit. All 8 patients had resolution of pain with range of 1–13 months after LNG-IUS placement, mean of 4.8 months (SD 3.94).

Group 2 comprises ten patients that had the LNG-IUS placed at some time after surgery. Their treatment course is summarized in Table 1. In this group all had postoperative hormonal therapy up until the time of LNG-IUS insertion. Eight patients were treated with GnRHa prior to LNG-IUS insertion. Four of these patients were also treated with either a COC or oral progestin. Two patients were treated with a COC or oral progestin alone. After insertion of the LNG-IUS, 5 patients needed no additional medication for pain or bleeding, while the other 5 were treated with a COC or oral progestin (4 patients) or GnRHa (1 patient) as shown in Figure 2. The 1 patient treated with GnRHa