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Consultation with the Specialist : Dysmenorrhea

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CONSULTATION WITH THE SPECIALIST

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Dysmenorrhea

Paula J. Adams Hillard, MD*

Objectives After completing this article, readers should be able to:

1. Recognize the prevalence of dysmenorrhea in adolescents and its common results.
2. Describe a menstrual history that is most consistent with primary dysmenorrhea.
3. List the mediators of uterine pain and contractions believed to be involved in the pathophysiology of primary dysmenorrhea.
4. Recommend the appropriate evaluation and management of primary dysmenorrhea, including the appropriate choice and dosing of both over-the-counter and prescription medications.
5. Recognize patients who should be referred for evaluation of possible causes of secondary dysmenorrhea.

Case

A 15½-year-old girl came to the office with complaints of the recent onset of painful menstrual periods. She experienced her first menstrual period at the age of 13 years and except for an occasional mildly uncomfortable menstrual period, had not experienced significant pain until recently. She reported regular monthly menses, although she did not write down the dates. She described additional symptoms that also had not been present previously, including headache, loose stools, and breast tenderness. She has tried several over-the-counter medications, including acetaminophen, without significant relief. She has missed 3 days of school in the last 6 weeks because of these complaints. She is otherwise healthy, having no major illnesses, no history of surgeries, and no other genitourinary complaints. There is no family history of endometriosis; severe dysmenorrhea; menorrhagia; irregular periods; infertility; uterine fibroids; or breast, ovarian, colon, or uterine cancer. Her mother recalled

that she had been prescribed oral contraceptives at the age of 16 years to alleviate her severe menstrual cramps. When spoken with privately, having been assured confidentiality, the girl denied sexual activity or abuse. She was doing well in school, making As and Bs, and felt that the relationship with her parents and one sister were good. She reported that she experienced crampy midline lower abdominal pain that began with the onset of vaginal bleeding and lasted 1 to 2 days. She rated the pain as being 8 on a scale of 10 and reported that she had to go to bed and sleep to cope with the pain.

This patient has a classic history of dysmenorrhea with minimal symptoms—other painful or uncomfortable symptoms associated with ovulatory menses, including breast tenderness, bloating, nausea, and headaches. She has no history of significant gynecologic or family medical problems. Given her previous inadequate trial of nonsteroidal anti-inflammatory drugs (NSAIDs), she was encouraged to chart her menstrual periods to allow her to predict their onset and to take an adequate dose and scheduled frequency (not prn) of

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Table 1. Conditions Related to Dysmenorrhea

Conditions That May Cause Secondary Dysmenorrhea

- Endometriosis
- Uterine fibroids
- Obstructive vaginal or uterine congenital anomalies
- Adenomyosis

Conditions That May Mimic Dysmenorrhea or Chronic Pelvic Pain

- Pelvic inflammatory disease
- Pelvic adhesions
- Ovarian cysts
- Inflammatory bowel disease
- Irritable bowel syndrome
- Interstitial cystitis

NSAIDs beginning prior to the onset of bleeding and continuing through the first 2 days of menstrual flow. It was the clinician's judgment that a pelvic examination was not indicated, given the classic symptoms of primary dysmenorrhea. A follow-up visit in 3 months was scheduled.

On return, the patient reported that she had experienced some relief of her pain and now rated her cramps as being 5 on a scale of 10, but she had missed 2 additional days of school over the 3 months. She and her mother both were interested in additional therapy; she reported that one of her girlfriends took oral contraceptives to help her periods. The family history was reviewed to confirm that there was no history of early cardiovascular events, including venous thromboembolism. No relatives had had gynecologic malignancies, including breast cancer. The clinician indicated that a pelvic ultrasonographic examination would provide information to help rule out structural causes of pelvic pain (Table 1), but a pelvic examination still was not be-

lieved to be required. Findings from pelvic ultrasonography were normal. The patient was prescribed combination oral contraceptives; told the potential risks, benefits, and adverse effects; and given specific guidelines to maximize compliance.

After 3 months, the patient returned, stating that she still had not experienced complete relief of her dysmenorrhea. She continued to rate her pain as being 5 on a 10-point scale when on oral contraceptives and NSAIDs. A bimanual examination was performed to assess for uterine tenderness that might suggest pelvic infection or endometriosis. No localized areas of tenderness were palpated posterior to the uterus or in the adnexal regions, as might be present with pelvic endometriosis. However, given the persistence of her symptoms, she was referred to the local medical center for consultation with an adolescent gynecologist and consideration of a diagnostic laparoscopy.

Definitions

Dysmenorrhea is defined as painful menstruation; the word is derived from the Greek words *dys*, meaning difficult/painful/abnormal, *meno*, meaning month, and *rrhea*, meaning flow. Primary dysmenorrhea typically begins during adolescence with ovulatory cycles and is not due to any pelvic disease; secondary dysmenorrhea is uncommon during adolescence and is due to the presence of pelvic disease. Previous attempts to categorize dysmenorrhea as "spasmodic" or "congestive" largely have been abandoned.

Epidemiology

Dysmenorrhea is the most common gynecologic condition of adolescence, occurring in 60% to 93% of adolescents. However, many do not seek medical care. One study reported that only 14% of adolescents

ages 12 to 17 years who had dysmenorrhea and only 29% of those who reported severe dysmenorrhea had seen a physician. Many teens are unaware of effective medications that are available over-the-counter, others do not know where to get gynecologic care, and many fear a pelvic examination.

Dysmenorrhea and other menstrual molimina typically are associated with ovulatory cycles. Because the hypothalamic-pituitary-ovarian axis requires time to mature, the incidence of ovulatory cycles increases with increasing gynecologic age; as many as one third of adolescents continue to experience anovulatory cycles in the fifth year after menarche. Thus, in the first several gynecologic years, dysmenorrhea often is absent or infrequent. It is not unusual for an adolescent to present to the emergency department because of pelvic cramping, experiencing her first episode of dysmenorrhea, and not recognizing that the pain is associated with her menses. Disability associated with dysmenorrhea is common; many teens report modifying their sports, work, and social activities around the time of their menses because of pain, and many miss school frequently. It has been reported that 14% of girls frequently miss work or school because of dysmenorrhea, and nearly 50% of those who have pain describe their pain as moderate or severe. One report in the mid-1980s estimated the economic loss in the United States due to dysmenorrhea among all women to be approximately \$2 billion, with more than 600 million lost work hours.

Dysmenorrhea statistically is more likely among adolescents who have early menarche, heavy menstrual flow, and a family history of dysmenorrhea. There is no association with height, body weight or body mass index, or history of abortion. Most

studies suggest that adolescents who exercise regularly or who smoke are less likely to experience dysmenorrhea. Although the cause of these associations is speculative, it may relate to relative hypoestrogenism and anovulatory cycles.

Pathogenesis

Until the early to mid-1960s, psychological factors were suggested as the major cause of primary dysmenorrhea; more recent studies suggest that emotional distress is not a major etiologic factor. In the 1970s, the pathophysiology of dysmenorrhea was elucidated and linked to the prostaglandin pathway. The physiologic basis of primary dysmenorrhea relates to cell membrane phospholipids, endomyometrial prostaglandins, and leukotrienes. After ovulation, in response to the production of progesterone, fatty acids build up in cell membrane phospholipids. Arachidonic acid and other omega-7 fatty acids are released and initiate a cascade of prostaglandins and leukotrienes in the uterus. These, in turn, mediate an inflammatory response, leading to menstrual cramps and other menstrual molimina. Prostaglandin (PG) F₂-alpha is a cyclooxygenase metabolite of arachidonic acid that causes myometrial hypertonus and vasoconstriction, with resultant ischemia and pain. Individuals who have primary dysmenorrhea produce an excess of endometrial PGs compared with those who have no pain, including, most notably, PGF₂-alpha. An abnormal PGF₂-alpha:PGE₂ ratio also has been reported in association with primary dysmenorrhea. Elevated endometrial levels of PGs have been found to correlate with the degree of pain reported. Infusion of PGF₂-alpha and PGE₂ induces dysmenorrhea. Further support for this mechanism of action is provided by the relief of symptoms

with PG synthetase (cyclooxygenase) inhibitor drugs.

It has been suggested that leukotrienes heighten the sensitivity of uterine pain fibers. High concentrations of leukotriene have been found in adult women who have dysmenorrhea; an increase in urinary leukotrienes also has been shown in adolescent girls who have dysmenorrhea. These substances are potent vasoconstrictors and inflammatory mediators, although the specifics of the mechanisms by which they are involved in causing dysmenorrhea are not well established.

Low back pain occurring in association with dysmenorrhea is due to referred pain from spinal nerves. Bloating may result from sensitivity to progesterone, a smooth muscle relaxant, produced in the second half of the cycle. Subsequent loose stools are a PG-mediated symptom. Migraine or other headaches may be triggered by declining levels of estrogen in the immediate premenstrual phase of the cycle. Mood lability or "premenstrual syndrome (PMS)" is more complex in etiology; cyclic hormonal fluctuations and hormonally mediated fluctuations in neurotransmitters likely are causative, although the specifics of these pathways are not well established. Elimination of hormonal cycling with gonadotropin-releasing hormone (GnRH) agonists has been effective in treating severe PMS and premenstrual dysphoric disorder. Their use is limited by both cost and adverse effects.

The pathologic mechanisms of pain associated with such causes of secondary dysmenorrhea as uterine fibroids, endometriosis, adenomyosis, and other pelvic pathologies may be somewhat more specific to the pathologic entity. Table 1 lists causes of secondary dysmenorrhea or conditions that may need to be considered

in adolescents who experience pelvic pain.

Endometriosis has been found to occur more frequently in first-degree relatives of women whose endometriosis has been confirmed surgically (7%) compared with first-degree relatives of their husbands (1%), suggesting a genetic component to this condition. Polygenic/multifactorial inheritance appears most likely.

Clinical Aspects

Symptoms

The defining symptom of primary dysmenorrhea is crampy midline lower abdominal pain that begins with menstrual flow or a short time before. Typically, the cramps are most intense on the first or second day of flow and resolve before the end of the menstrual flow. The pain may be referred and experienced as lower back or anterior thigh pain. Nausea or vomiting may occur in some individuals. Near-syncope or "dizziness" (not true vertigo) and complaints of "weakness" also can occur. Other premenstrual or menstrual molimina, including breast tenderness, bloating, headache, and mood changes, also may be troublesome or disabling.

Secondary dysmenorrhea is more likely to begin several days or even 1 to 2 weeks prior to the onset of bleeding and to persist through the end of menstrual flow. Associated symptoms, including heavy bleeding, may suggest uterine fibroids as a cause.

Signs

An abdominal examination is important to rule out nongynecologic causes of pain such as irritable bowel syndrome or even gastroesophageal reflux or gastritis. A periumbilical location argues for these latter conditions and against a pelvic/gynecologic etiology. Left lower quadrant full-

ness over the left colon is common with irritable bowel syndrome. The examiner must take care not to mistake the enlarged uterus associated with vaginal outlet obstruction and hematometra for obesity. Abdominal examination findings in primary dysmenorrhea include only mild suprapubic tenderness with normal bowel sounds, no upper abdominal tenderness, and no rebound tenderness.

An abdominal examination can determine abdominal wall trigger points associated with musculoskeletal pain, which is a common concomitant of dysmenorrhea. An evaluation for signs of musculoskeletal pain (Carnett sign) can be helpful. A bimanual examination during menses may reveal mild diffuse uterine tenderness without cervical motion or adnexal tenderness. Although a complete gynecologic/pelvic examination is not mandatory for evaluation of classic dysmenorrhea, inspection of the external genitalia is important to reveal an imperforate hymen or distal uterine septum. Other congenital anomalies such as a didelphic uterus with unilateral obstruction, a longitudinal vaginal septum with hemi-obstruction, cervical agenesis, cervical stenosis, or a partially obstructing uterine septum may not be elucidated completely by pelvic examination; imaging with pelvic ultrasonography or, if this is inconclusive, magnetic resonance imaging may be required.

For adolescents whose external genitalia are normal and who have classic symptoms of dysmenorrhea, a pelvic examination is not required initially. If initial therapy is ineffective, a bimanual examination can be helpful; endometriosis can be associated with mild posterior uterine/cul-de-sac tenderness. The cul-de-sac (pouch of Douglas) posterior to the uterus is the most dependent portion of the pelvis and, thus, the most likely

site for pelvic endometriosis. In adolescents, the classic findings of uterosacral nodularity are rare. The absence of posterior uterine tenderness argues against endometriosis.

Laboratory Tests

Laboratory testing typically is not required for the diagnosis of primary dysmenorrhea. If gastrointestinal (GI) disease is suspected, a rectal examination that includes testing for occult blood may be helpful. An erythrocyte sedimentation rate, while nonspecific, may be abnormal in conditions such as inflammatory bowel disease, but typically is normal with primary dysmenorrhea. Transabdominal or transvaginal ultrasonography can rule out ovarian pathology or an obstructive uterine or vaginal lesion. Transvaginal ultrasonography provides a more definitive picture of the internal pelvic organs. Adolescents who are sexually active usually tolerate this examination well, as can many appropriately informed mid- to older adolescents who have been using tampons successfully. Transvaginal ultrasonography should not be attempted in a virginal younger teen without an assessment of her ability to tolerate this approach and a discussion of what should be expected with the examination.

Diagnosis

The diagnosis of primary dysmenorrhea rests on a classic pain history, with attention to the timing and onset of symptoms (typically a few hours before onset of bleeding and lasting for 1 to 3 d), the nature and location of the complaints (crampy pelvic pain), the presence of menses, the presence of minimal symptoms associated with ovulation, and the lack of other signs or symptoms that suggest a secondary cause. The pain of secondary dysmenorrhea often begins 1 to 2 weeks

prior to menses, may be more constant, and often persists throughout the duration of menstrual flow. A bimanual examination is indicated if signs or symptoms suggest secondary dysmenorrhea. Findings on examination that suggest endometriosis or uterine fibroids may prompt further study, including pelvic ultrasonography or laparoscopy.

Management NSAIDs

The management of primary dysmenorrhea involves the use of NSAIDs, which are cyclooxygenase inhibitors that reduce the production of PGs. Some NSAIDs, in particular meclofenamic acid, inhibit both cyclooxygenase and lipoxygenase pathways, inhibiting the production of leukotrienes as well. This theoretical advantage has not been shown to result in a clear-cut advantage of one NSAID over another. Cyclooxygenase type 2 (COX-2) inhibitors are approved by the United States Food and Drug Administration (FDA) for the treatment of primary dysmenorrhea in adults; pediatric use has not been evaluated. The FDA defines the adolescent subpopulation of pediatrics as including ages 13 to 21 years. Until recently raised questions of the safety of the COX-2 inhibitors have been answered satisfactorily, their use is not recommended for first-line therapy of dysmenorrhea.

Over-the-counter pain medications frequently are used for dysmenorrhea; such use has been reported in 30% to 70% of adolescents. However, many adolescents are unaware of the differences in the mechanism of action of over-the-counter analgesics and often do not distinguish between those that have effective components and those that do not. Several medications that are marketed heavily for dysmenorrhea in teens do not contain components that have any

proven efficacy. In addition, so many different formulations of these over-the-counter drugs exist (Table 2) that even when some of the formulations contain NSAIDs, it is difficult for teens to decipher this from merely knowing the names of the drugs.

Teens commonly take medications for dysmenorrhea that are ineffective. In addition, most lay persons do not understand pharmacology, that is, concepts of loading dose, duration of action, half-life, and sustained serum levels of drugs. They rarely take NSAIDs prophylactically, often take subtherapeutic doses at random intervals, and even may expect a single dose of 200 mg of over-the-counter ibuprofen to last throughout the duration of their cramps. Effective relief of primary dysmenorrhea can be obtained with NSAIDs in up to 80% of teens when taken in appropriate doses and frequency. A Cochrane systematic review concluded that “NSAIDs are an effective treatment for dysmenorrhoea, although women using them need to be aware of the significant risk of adverse effects” and that “there is insufficient evidence to determine which (if any) individual NSAID is the most safe and effective for the treatment of dysmenorrhoea.”

Nonpharmacologic Therapies

Some nonpharmacologic therapies have been shown in small series to be effective for dysmenorrhea. Two of these therapies, transcutaneous electrical nerve stimulation (TENS) and spinal manipulation, have been included in a Cochrane systematic review of efficacy with conclusions of efficacy for primary dysmenorrhea. (1)(2) TENS appears to work by blocking efferent pain stimuli. Topical heat, in the form of either a hot water bottle or heating pad or newer chemical heat-producing adherent

Table 2. Over-the-counter Analgesics Marketed for Dysmenorrhea*

Multicomponent Formulations

- Midol® (Bayer Healthcare LLC)
 - “Menstrual Complete”—500 mg acetaminophen, 60 mg caffeine, 15 mg pyrilamine
 - “Premenstrual Syndrome”—500 mg acetaminophen, 25 mg pamabrom, 15 mg pyrilamine
 - “Teen Formula”—500 mg acetaminophen, 25 mg pamabrom
 - “Cramps and body aches”—ibuprofen 200 mg
 - “Maximum strength extended relief”—naproxen sodium 200 mg (approved by FDA)
- Pamprin® (Chattem, Inc)
 - “Multi-symptom”—500 mg acetaminophen, 25 mg pamabrom, 25 mg pyrilamine (similar to Midol Premenstrual except 15 mg pyrilamine)
 - “All Day”—220 mg naproxen sodium
 - “Cramp”—250 mg acetaminophen, 250 mg magnesium salicylate, 25 mg pamabrom

NSAIDs

- Ibuprofen
 - Motrin® (McNeil Consumer & Specialty Pharmaceuticals)—200 mg q 4 to 6 h; two if no relief; not more than six in 24 h
 - Advil® (Wyeth Consumer Healthcare)—200 mg
 - Nuprin® (McNeil Consumer & Specialty Pharmaceuticals)—200 mg
- Naproxen sodium
 - Aleve® (Bayer Corporation)—220 mg q 8 to 12 h; two as initial dose; not more than three per 24 h
- Ketoprofen
 - Orudis KT® (Whitehall–Robins Healthcare)—12.5 mg

*Note that the only components of the multicomponent formulations that have proven efficacy for dysmenorrhea are naproxen and ibuprofen; thus, the use of the other multicomponent formulations without proven efficacy should be discouraged.

pads, may be effective and is associated with minimal risks. A Cochrane systematic review concluded that spinal manipulation therapy for primary dysmenorrhea was no more effective than sham manipulation. Herbal preparations such as black cohosh, oil of fennel, and evening primrose oil have been suggested, but the data to support their use and safety are sparse.

Oral Contraceptives

Combination oral contraceptives have been prescribed widely in the last 40 years for dysmenorrhea in those who have not experienced sufficient relief with NSAIDs or who also require contraception. Oral con-

traceptives reduce PG release by inhibiting ovulation and, thus, decreasing the progesterone-induced increase in PG synthesis. Decreases in both PGs and leukotrienes have been noted in the menstrual fluid of women taking oral contraceptives compared with controls.

Oral contraceptives are well tolerated in adolescents and provide additional noncontraceptive benefits, such as improvement in acne. Adolescents who experience relief of dysmenorrhea are more likely to use oral contraceptives consistently and correctly. Combination oral contraceptives for management of dysmenorrhea are an appropriate therapy if no

significant medical or family history precludes their use. Some clinicians or parents may be reluctant to begin oral contraceptives for the management of dysmenorrhea in the mistaken belief that they will promote the earlier initiation of sexual intercourse.

Oral contraceptives should be considered for adolescents who have not experienced sufficient relief of dysmenorrhea with NSAIDs. The literature and a Cochrane systematic review support the use of older medium-dose oral contraceptives; clinical practice suggests the efficacy for newer lower-dose oral contraceptives. The Cochrane review states that no clear conclusions can be drawn about the use of newer ultra low-dose oral contraceptives for dysmenorrhea. (3) Thus, a 30- or 35-mcg ethinyl estradiol-containing pill may be preferable to a 20-mcg formulation.

The FDA supports deferring the pelvic examination prior to initiating oral contraceptives in selected adolescents. However, adolescents who have a history of sexual intercourse should undergo sexually transmitted disease testing (which may be performed by using urine-based nucleic acid amplification tests) and may be candidates for cervical cytology testing (depending on the age of initiation of sexual intercourse, as recommended by American Cancer Society guidelines).

One alternative therapy for adolescents who do not have endometriosis but who have persistent dysmenorrhea in spite of oral contraceptives and NSAIDs is the extended cycling of oral contraceptives. A recently marketed combination oral contraceptive has been formulated with 84 days of hormonally active pills followed by 7 days of placebo, rather than the traditional but arbitrary 21/7 formulation. Significant dys-

menorrhea represents an excellent indication for use of oral contraceptives in this manner because menstrual periods and, thus, dysmenorrhea occur less frequently. The packaging of this oral contraceptive makes insurance coverage, compliance, and successful use more likely. Girls using oral contraceptives in this formulation must be cautioned that breakthrough or unscheduled bleeding is not uncommon, particularly in the early 84/7 cycles. Other traditional 21/7 oral contraceptive formulations are equally efficacious and can be used in an extended or continuous fashion by discarding placebos.

Potential Endometriosis

Referrals for possible laparoscopy should be considered to determine the possibility of endometriosis in adolescents: 1) who have persistent dysmenorrhea in spite of adequate doses and frequency of NSAIDs and combination oral contraceptives, 2) who have a first-degree relative who has endometriosis, 3) who have pelvic findings of posterior uterine or cul-de-sac tenderness on pelvic examination, 4) who have a history of significant disability due to pain, 5) who have had costly previous medical evaluations (hospitalizations or GI endoscopy), 6) whose mother or family needs surgical confirmation, 7) who have a high level of anxiety, 8) who are suspected of having psychopathology and will not accept recommendations for counseling without surgical confirmation or refutation, and 9) who are undergoing other surgical procedures such as appendectomy or GI endoscopy.

Although the American College of Obstetricians and Gynecologists *Practice Bulletin on Chronic Pelvic Pain* suggests that empiric treatment with GnRH agonists without laparoscopy be considered as an accept-

able approach to treatment in adults, this author contends that differences between adults and adolescents are sufficient that surgical confirmation is preferable in adolescents. The prospect of condemning an adolescent to a diagnosis of endometriosis carries more potential implications for teens, given their longer prospective reproductive lifetimes. In addition, many adolescents are very concerned about their future infertility and may be less able than adults to understand the implications of endometriosis on fertility. Finally, the potential risks to bone density of therapy with GnRH agonists during a time of adolescent bone growth and accretion are of concern. One small study examined the impact of GnRH agonist therapy for endometriosis on adolescent bone density and found no significant age-related effect on absolute bone mineral density (BMD) loss with a single 6-month course, but the authors urged caution in the use of such therapy prior to the patient achieving peak BMD (mid- to late twenties). In adults, recovery of BMD has been shown and is greater with higher calcium intake. However, nearly 90% of teens do not have an adequate calcium intake, and adolescent basal calcium requirements are higher than adult requirements.

Thus, such therapy may be indicated, but should be determined by a gynecologist who has experience in managing chronic pelvic pain and dysmenorrhea in adolescents and in diagnosing endometriosis surgically. The early lesions of endometriosis may not have the classic "powderburn" appearance that they have in adults; instead, they may appear as clear, vesicular, white, or red lesions that are atypical. If endometriosis is not seen and confirmed by laparoscopic biopsy, the teen and her family should be assured that this informa-

tion is “good news” and that the clinician will continue to work with the family to provide adequate pain relief.

Conclusion

The use of generic NSAIDS with appropriate dosing, frequency, and duration is cost-effective for the relief of primary dysmenorrhea. When NSAIDS provide insufficient relief of dysmenorrhea and secondary causes are not suspected, generic oral contraceptives can provide cost savings and are likely to maintain efficacy. When quality of life is factored into an analysis, the costs of missed hours of school and work due to dysmenorrhea can be considerable. Insurance coverage for oral contraceptives is variable. Some policies do not cover oral contraceptives, even when prescribed for noncontraceptive indications; others may provide coverage for dysmenorrhea if a letter of medical necessity is provided by the clinician. Even when these medications are not covered by prescription benefits, many families conclude that preventive measures such as NSAIDS and

combination oral contraceptives provide a benefit that is worth the cost.

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PIR Quiz

Quiz also available online at www.pedsinreview.org.

11. You are evaluating a 16-year-old patient whose chief complaint is painful periods. She is experiencing increasingly severe pain that begins less than 1 day before menstrual flow and typically is worst on the first 2 days of flow. She reports moderate menstrual bleeding. She denies sexual activity and other medical problems. Bimanual examination reveals no tenderness of the uterus or the posterior cul-de-sac and otherwise is normal. Which of the following is the *most* likely diagnosis?
 - A. Endometriosis.
 - B. Fibroids.
 - C. Imperforate hymen.
 - D. Ovarian cyst.
 - E. Primary dysmenorrhea.

12. Which of the following is *most* likely to be associated with dysmenorrhea?
 - A. Late onset of menarche.
 - B. Migraine headaches.
 - C. Obesity.
 - D. Ovulatory cycles.
 - E. Regular exercise.

13. A 14-year-old girl comes to your clinic because of menstrual pain. Menarche was at age 12 years. She reports suprapubic pain that begins on the second day of her cycle and lasts for 2 days. She denies heavy bleeding. She is not sexually active. Her external genitalia are normal, as are the remainder of the findings on her physical examination. You suspect primary dysmenorrhea. Which of the following is a *true* statement regarding the management of this patient?
 - A. A pelvic and bimanual examination must be performed before therapy is initiated.
 - B. Acetaminophen taken at the onset of pain probably will reduce her symptoms.
 - C. Exercising daily has been proven to be efficacious in the reduction of pain.
 - D. Nonsteroidal anti-inflammatory drugs should be the first therapy she tries.
 - E. Ultrasonography of the pelvis should be obtained before therapy is initiated.

14. For which of the following patients who have dysmenorrhea would referral for laparoscopy be *most* appropriate?
 - A. A 15-year-old girl whose mother has a history of endometriosis.
 - B. A 15-year-old girl who still has pain despite taking ibuprofen as needed.
 - C. A 16-year-old girl who has missed 3 days of school this year because of pain.
 - D. A 16-year-old girl who is sexually active.
 - E. A 17-year-old girl whose mother has a history of fibroids.

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