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No. 345-Primary Dysmenorrhea Consensus Guideline

This Clinical Practice Guideline has been prepared and reviewed by the Society of Obstetricians and Gynaecologists of Canada Clinical Practice-Gynaecology and CANPAGO Committees and approved by the Board of the SOGC.

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Key Words: Primary dysmenorrhea, secondary dysmenorrhea, pelvic pain, menstrual pain, endometriosis, menorrhagia, management of dysmenorrhea

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Abstract

Objective: This guideline reviews the investigation and treatment of primary dysmenorrhea.

Intended Users: Health care providers.

Target Population: Women and adolescents experiencing menstrual pain for which no underlying cause has been identified.

Evidence: Published clinical trials, population studies, and review articles cited in PubMed or the Cochrane database from January 2005 to March 2016.

Validation Methods: Seven clinical questions were generated by the authors and reviewed by the SOGC Clinical Practice-Gynaecology Committee. The available literature was searched. Guideline No. 169 was reviewed and rewritten in order to incorporate current evidence. Recommendations addressing the identified clinical questions were formulated and evaluated using the ranking of the Canadian Task Force on Preventive Health Care.

Women have the right and responsibility to make informed decisions about their care in partnership with their health care providers. In order to facilitate informed choice, women should be provided with information and support that is evidence based, culturally appropriate, and tailored to their needs. The values, beliefs, and individual needs of each woman and her family should be sought, and the final decision about the care and treatment options chosen by the woman should be respected.

Table 1. Key to evidence statements and grading of recommendations, using the ranking of the Canadian Task Force on Preventive Health Care

Quality of evidence assessment[a]	Classification of recommendations[b]
I: Evidence obtained from at least one properly randomized controlled trial.	A. There is good evidence to recommend the clinical preventive action.
II-1: Evidence from well-designed controlled trials without randomization.	B. There is fair evidence to recommend the clinical preventive action.
II-2: Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than one centre or research group.	C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making.
II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in the category.	D. There is fair evidence to recommend against the clinical preventive action.
III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.	E. There is good evidence to recommend against the clinical preventive action.
	I. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making.

[a]The quality of evidence reported in these guidelines has been adapted from The Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

[b]Recommendations included in these guidelines have been adapted from the Classification of recommendations criteria described in the Canadian Task Force on Preventive Health Care.

Benefits, Harms, and Costs: Primary dysmenorrhea is common and frequently undertreated. Effective therapy is widely available at minimal cost. Treatment has the potential to improve quality of life and to decrease time lost from school or work.

Guideline Update: This guideline is a revision and update of No. 169, December 2005.

Sponsors: SOGC.

Summary Statements

1. Dysmenorrhea is highly prevalent and commonly undertreated (III).
2. Non-steroidal anti-inflammatory drugs are more effective than placebo but have more gastrointestinal side effects. All currently available non-steroidal anti-inflammatory drugs are of comparable efficacy and safety (I).
3. Suppression of ovulation is associated with decreased menstrual pain (II-1).
4. Amenorrhea induced by any means is beneficial for the treatment of dysmenorrhea (II-2).
5. Hysterectomy is effective treatment (II-2).
6. There is some evidence to support laparoscopic nerve ablation in selected cases (II-1).
7. Endometrial ablation is likely to reduce symptoms of dysmenorrhea when it occurs in the presence of menorrhagia (I).

ABBREVIATIONS

CANPAGO	Canadian Pediatric and Adolescent Gynecology and Obstetrics Committee
CHC	combined hormonal contraceptive
COC	combined oral contraceptive
hfTENS	high-frequency transcutaneous electrical nerve stimulation
LN-IUS	levonorgestrel intrauterine system
LUNA	laparoscopic uterosacral nerve ablation
NSAID	non-steroidal anti-inflammatory drug
PSN	pre-sacral neurectomy
TENS	transcutaneous electrical nerve stimulation

Recommendations

1. Both primary and secondary dysmenorrhea are likely to respond to the same medical therapy. Therefore, initiation of treatment should not depend on establishing a precise diagnosis (II-1A).
2. Health care providers should include specific questions regarding menstrual pain when obtaining a woman's medical history (III-B).
3. A pelvic examination is not necessary prior to initiating therapy (III-D).
4. A pelvic examination is indicated in patients not responding to conventional therapy and when organic pathology is suspected (III-B).
5. Non-steroidal anti-inflammatory drugs, administered with regular dosing regimens, should be considered first-line treatment for most women (I-A).
6. Hormonal therapies should be offered to women and girls who are not currently planning pregnancy unless contraindications exist (I-A).
7. Continuous or extended use combined hormonal contraceptives are recommended (I-A).
8. Regular exercise is likely to improve symptoms of dysmenorrhea and should be recommended (II-1A).
9. Local heat in the form of heated pads or patches should be recommended as a complementary treatment for dysmenorrhea (I-A).
10. High-frequency transcutaneous electrical nerve stimulation should be considered as a complementary treatment or in women unable or unwilling to use conventional therapy (II-1B).
11. Acupoint stimulation should be considered for women wishing to use complementary or alternative therapies (II-1B).
12. Ginger is recommended for women wishing to use complementary or alternative therapies (I-A).
13. Preoperative investigations should include a detailed history and physical examination, ultrasound, and possibly magnetic resonance imaging to discover secondary causes for dysmenorrhea and to direct appropriate therapy (III-A).
14. Surgical intervention should only be considered if a concerted trial of medical therapy has not been successful (III-A).

DEFINITION AND PATHOPHYSIOLOGY

"Dysmenorrhea" is derived from a Greek root meaning difficult menstrual flow. Primary dysmenorrhea is defined as pain occurring with menses in the absence of pelvic pathology. Secondary dysmenorrhea is menstrual pain associated with underlying pelvic pathology such as endometriosis. Primary dysmenorrhea usually begins in adolescence after the establishment of ovulatory cycles.[1,2] Ovulatory cycles are believed to be associated with painful uterine contractions triggered by progesterone withdrawal at the beginning of menses.[3] These contractions result in uterine ischemia, causing pain modulated and augmented by prostaglandins. Uterine contractions may last many minutes and sometimes produce uterine pressures greater than 60 mmHg. Multiple other factors may play a role in the perception and the severity of the pain.[1]

RISK FACTORS

Dysmenorrhea is the most common gynaecological symptom reported by women. Ninety percent of women presenting for primary care experience some menstrual pain.[4] Population surveys suggest that, although prevalence rates vary considerably by geographical location, complaints of dysmenorrhea are widespread in diverse populations.[5–11] One third to one half of these women report moderate or severe symptoms. Symptoms are frequently associated with time lost from school, work, and other activities.[12] Despite the frequency and severity of dysmenorrhea, most women do not seek medical treatment for this condition.[5,13]

Age is inversely related to menstrual pain,[13] with symptoms being more pronounced in adolescents.[10,13,14] There is some evidence that parous women tend to have less dysmenorrhea.[7,14–17]

Smoking aggravates menstrual pain.[13,14,16,18,19] A recent prospective study found that dysmenorrhea is also associated with exposure to environmental tobacco smoke.[20]

There is some evidence that frequent life changes, fewer social supports, and stressful close relationships are associated with dysmenorrhea.[21] There may be an increased prevalence of dysmenorrhea in lower socioeconomic groups.[4] Mood disorders are associated with primary dysmenorrhea[22] as is pain hypersensitivity.[23]

DIAGNOSIS/DIFFERENTIAL DIAGNOSIS/ INVESTIGATIONS

Diagnosis of Primary Dysmenorrhea

Typically, primary dysmenorrhea is characterized by crampy, suprapubic pain that begins between a few hours before and a few hours after the onset of the menstrual bleeding. Symptoms peak with maximum blood flow[24] and may persist up to 2 to 3 days. Symptoms are more or less reproducible from one menstrual period to the other.[25] The pain is characteristically colicky and located in the midline of the lower abdomen but may also be described as dull and may extend to both lower quadrants, the lumbar area, or the thighs. Associated symptoms include diarrhea, nausea and vomiting, fatigue, light-headedness, headache, dizziness, and rarely syncope and fever.[24,26–28] These symptoms have been attributed to prostaglandin release.[1,2]

Adolescents may experience menstrual pain with their first periods without any demonstrable underlying cause, especially when the bleeding is heavy and accompanied by clots.[26] However, onset of dysmenorrhea with menarche should alert the physician to the possibility of an obstructing malformation of the genital tract.

Differential Diagnosis

The differential diagnosis of dysmenorrhea is summarized in Table 2. Endometriosis is the most frequent cause of secondary dysmenorrhea. In adolescent girls, endometriosis is found in approximately 70% of those undergoing laparoscopy for chronic pelvic pain not responding to NSAIDs and oral contraceptives.[29] Non-gynaecological causes of chronic pelvic pain, including pelvic adhesions, inflammatory bowel diseases, irritable bowel syndrome, interstitial cystitis, and psychiatric disorders, may be more symptomatic during menses.[22]

Table 2. Differential diagnosis of dysmenorrhea

Primary dysmenorrhea
Secondary dysmenorrhea
- Endometriosis
- Adenomyosis
- Uterine myomas
- Cervical stenosis
- Obstructive lesions of the genital tract

Other causes of menstrual pain may include the following:
- Pelvic inflammatory disease
- Pelvic adhesions
- Irritable bowel syndrome
- Inflammatory bowel disease
- Interstitial cystitis
- Mood disorders
- Myofascial pain

Clinical Approach

History

Many women consider menstrual pain, even severe and incapacitating, as inevitable. They may not seek medical assistance and frequently do not make use of the therapies that are available.[13,26] When a health care provider identifies menstrual pain on history, an attempt should be made to differentiate between primary and secondary dysmenorrhea. Menstrual history should include age at menarche, length and regularity of cycles, amount of bleeding, and length of time elapsed between menarche and the beginning of dysmenorrhea. Dysmenorrhea occurring with menarche may indicate a müllerian anomaly. The pain should be clearly defined in terms of type, location, radiation, associated symptoms, and the chronology of the onset of pain in relation to menstrual bleeding. The severity and duration of symptoms, the progression over time, and the degree of the patient's disability should be established. Significant gastrointestinal or urinary symptoms or the presence of pelvic pain not related to the menstrual cycle may suggest non-gynaecological causes of pelvic pain.

In obtaining a thorough history, it is important to inquire about sexual activity, dyspareunia, and contraception. Adolescents may use dysmenorrhea as a pretext to obtain contraception.[28] Past obstetric and gynaecological history, in particular sexually transmitted infections, pelvic infection, infertility, sexual violence, and pelvic surgery, and other medical and psychiatric problems should be recorded (Table 3).

The patient should also be asked about all types of therapy tried in the past. Because many patients do not use medication in adequate doses, it is essential to inquire about the way medication was used. Campbell and McGrath reported that in a group of high school girls aged 14 to 21 using over-the-counter medications for menstrual discomfort, only 31% took the recommended daily dosage. Of those using a prescription drug, 13% reported using less than the prescribed dose. In the same study, participants waited a median of 30 minutes after the onset of pain before taking their medication and only 16% of them took it prophylactically.[30]

Table 3. Dysmenorrhea history checklist

1. Menstrual history
2. Relationship between menarche and onset of dysmenorrhea
3. Timing of pain in relation to menses and amount of menstrual flow
4. Characterization, severity, chronology, and resulting disability
5. Sexual history including inquiry about sexual abuse
6. Inquiry about chronic pain syndromes and medical conditions
7. Presence of symptoms of depression, anxiety, or other psychiatric disorders
8. Previous treatment including dose, duration of use, side effects, and response

Physical Examination

An abdominal examination should be performed to rule out palpable pathology. In a woman who has never been sexually active and presents with a typical history primary dysmenorrhea, pelvic examination is not necessary.[25–28] Some authors recommend inspecting the external genitalia of all patients to exclude an abnormality of the hymen.[27] On the other hand, when history is suggestive of organic disease or congenital malformation of the genital tract, and when the patient does not respond to the conventional therapy of primary dysmenorrhea, a pelvic examination is indicated.

Investigations

Laboratory testing or imaging is not generally helpful in the diagnosis of primary dysmenorrhea.

There is no evidence for the routine use of ultrasound in the initial evaluation of dysmenorrhea. For women who experience dysmenorrhea refractory to first-line therapy, or in women who have a clinical abnormality on physical examination, ultrasound may help to identify causes of secondary dysmenorrhea. In adolescents, in whom a pelvic examination is impossible or unsatisfactory, ultrasound may uncover a pelvic mass or an obstructing müllerian malformation. Ultrasonography cannot detect subtle signs of organic disease such as utero-sacral ligament tenderness or nodules and cervical motion tenderness.

MRI is a promising diagnostic tool for fibroids, adenomyosis, deep endometriosis, and uterine anomalies. This expensive test should be reserved for investigation of recalcitrant cases of dysmenorrhea that do not respond to 3 to 6 months of adequate therapy.[31,32]

Endometriosis may be associated with an elevated Ca125 level, and a negative test has sometimes been used as a surrogate marker for primary dysmenorrhea.[33] However, because of its low sensitivity and specificity, Ca125 is not generally recommended in the absence of an adnexal mass.

Laparoscopy is used to establish a definite diagnosis of endometriosis, pelvic inflammatory disease, or pelvic adhesions. It should be performed when these pathologies are strongly suspected and when a reasonable trial of medical therapy has failed. In adolescent girls not responding to therapy, diagnostic laparoscopy should not be unduly postponed because the prognosis for pain control in endometriosis may be improved by an early diagnosis.[34] Gynaecologists are usually experienced with the laparoscopic diagnosis of endometriosis in adult

women. In adolescents, however, the appearance of endometriotic implants may have variable morphology. In these younger patients, red flame, white, and clear lesions are seen more frequently than the classical blue-black and powder burns lesions found in adults.[35] Laufer has proposed that using fluid as a distension medium during laparoscopy facilitates the identification of clear lesions that may be missed with conventional laparoscopic techniques.[36] Biopsies of visible lesions, especially when atypical, are recommended in order to have histological confirmation of the diagnosis.

MEDICAL TREATMENT

Non-Hormonal Medical Therapy

Acetaminophen

Acetaminophen is an analgesic that that acts as a weak cyclooxygenase inhibitor in the presence of high peroxide concentrations present in inflammatory tissues. It acts centrally and produces analgesia by raising the pain threshold. Acetaminophen has good gastrointestinal tolerance and no inhibition of hemostasis. A randomized trial published in 2007 showed acetaminophen and acetaminophen with caffeine to be superior to placebo in the treatment of primary dysmenorrhea.[37] Acetaminophen and pamabrom in combination are marketed for the temporary relief of dysmenorrhea. Pamabrom is a mild, short-acting diuretic that relieves water retention. There is some evidence supporting the use of acetaminophen with pamabrom.[38]

Non-steroidal anti-inflammatory drugs

Uterine prostaglandin overproduction is believed to be a contributing factor to the pain of dysmenorrhea. NSAIDs are analgesics that inhibit the cyclooxygenase enzymes, thereby inhibiting the peripheral production of prostaglandins. In a recent Cochrane review, NSAIDs were found to be consistently more effective than placebo, although adverse effects were significantly more common.[39] When NSAIDs were compared with each other, there was little evidence of superiority with regard to either efficacy or safety. Women taking NSAIDs were significantly less likely to report restriction of daily activities and absenteeism from work or school compared with women taking placebo.

If effective treatment is initiated with the onset of bleeding and/or associated symptoms, NSAIDs are usually not required for more than 2 or 3 days. Recommended dosing includes starting with an initial loading dose followed by regular, scheduled dosing up to the recommended daily maximum.

Hormonal Treatment

Combined hormonal contraceptives

Dysmenorrhea responds favourably to inhibition of ovulation. The COC suppresses ovulation and endometrial tissue growth, thereby decreasing menstrual blood volume and prostaglandin secretion[40–42] with subsequent decreases in intrauterine pressure[41] and uterine cramping.[43] CHC use is consistently associated with a lower prevalence of dysmenorrhea. Multiple observational studies support this association.[13,44–51] A 2004 Cochrane review, including 4 randomized trials, determined that COCs with 35 μg ethinyl estradiol were superior to placebo for menstrual pain relief. Treatment with COC compared with placebo significantly reduced absences from work or school.[52] In an RCT, Hendrix and Alexander demonstrated a significant reduction in painful menstrual cramping in users of a COC containing 20 μg ethinyl estradiol compared with placebo.[53] Similarly, Harada et al. confirmed that a low dose COC was superior to placebo in the treatment of dysmenorrhea.[54]

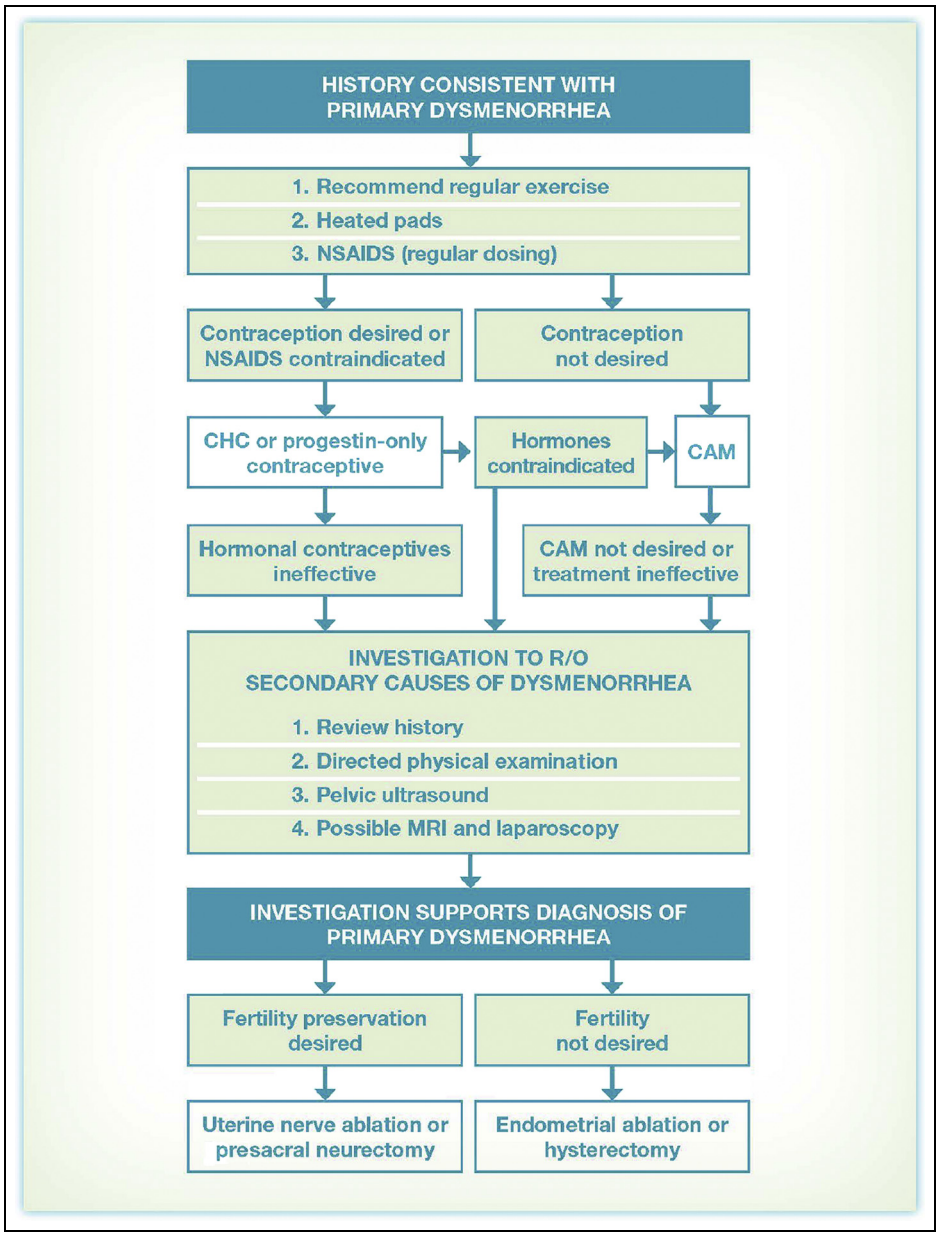
Extended cycle or continuous CHC may have a number of advantages, including a decreased prevalence of dysmenorrhea.[55–57] A randomized trial by Dmitrovic et al. compared continuous versus cyclical oral contraceptive regimens and used dysmenorrhea as the primary treatment outcome. In this well-designed study, the COC was shown to be significantly more effective when used in a continuous manner.[58] A recent Cochrane review concluded that continuous and extended use CHC regimens were superior to cyclical regimens for pain relief in dysmenorrhea.[59]

It is important to note that many of these trials did not differentiate between primary and secondary dysmenorrhea. Hormonal contraceptives appear to be efficacious in both. In a secondary analysis of 2 randomized trials, the COC was shown to be beneficial even in women who were subsequently found to have an underlying organic cause for their pain.[60] In general, hormonal treatments for primary dysmenorrhea tend to be effective treatment for conditions that produce secondary dysmenorrhea. Therefore, it is reasonable to maximize medical treatment in all women complaining of dysmenorrhea without awaiting the results of further investigations even if organic pathology is suspected (Figure 1).

Progestin regimens

Depot medroxyprogesterone acetate works primarily by suppressing ovulation.[61] It can also induce endometrial atrophy.[62] Amenorrhea rates range from 55% at 12 months to 68% at 24 months.[63] Women using depot medroxyprogesterone acetate for contraception tend to

Figure 1. Primary dysmenorrhea treatment algorithm.



report reduced rates of dysmenorrhea.[64–66] The progesterone-only pill may decrease menstrual flow and up to 10% of users will develop amenorrhea. Continuous oral progestin is useful as an alternative to CHC with comparable pain relief and fewer side effects.[67] Dienogest is a progestin that is significantly more efficient than placebo and non-inferior to leuprolide acetate in treating dysmenorrhea resulting from endometriosis. It induces a 39% amenorrhea rate at 6 months and presents a generally well tolerated side effect profile.[68] Because many patients presenting with primary dysmenorrhea may have endometriosis lesions, dienogest is an interesting empirical treatment option in women not in need of contraception.

Dysmenorrhea associated with endometriosis and adenomyosis has been shown to improve in LNG-IUS 52 mg users.[69,70] In general, women with either primary or secondary dysmenorrhea are likely to report a reduction in menstrual pain with LNG-IUS 52 mg.[71–73] In a Cochrane review of LNG-IUS used for heavy menstrual bleeding, dysmenorrhea was significantly decreased in women randomly assigned to LNG-IUS 52 mg.[74]

COMPLEMENTARY AND ALTERNATIVE THERAPY

Exercise, local heat, behavioural interventions, and dietary/herbal supplements are commonly used by women in an effort to relieve dysmenorrhea.[75]

Exercise

In a review of 4 RCTs and 2 observational studies, exercise was associated with a reduction in dysmenorrhea symptoms.[76] However, these studies were noted to have multiple methodological flaws. The authors of a 2010 Cochrane review were only able to identify 1 qualified trial on which to base their conclusions. In that study, there was some evidence that exercise reduced menstrual symptoms based on a sustained decrease in Moos' Menstrual Distress Questionnaire scores over 3 cycles.[77] An open-label randomized trial of non-athlete adolescents compared an aquatic exercise regimen with no treatment.[78] The intervention group showed significant reduction in dysmenorrhea. Assuming that exercise is unlikely to result in harm, it is reasonable to recommend it even without strong supportive evidence from randomized trials.

Transcutaneous Electrical Nerve Stimulation

TENS involves the use of electrodes to stimulate the skin at various frequencies and intensities in an attempt to diminish pain perception. TENS may be categorized as either high or low frequency. A 2002 Cochrane review of 8 trials provided support for the use of hfTENS as an efficacious treatment option.[79] Similarly, a recent randomized, single-blind trial demonstrated results favouring the application of hfTENS in combination with heat therapy.[80] Although there is no evidence that hfTENS is superior to standard therapy,[81] it may be a useful alternative for women unable or unwilling to use NSAIDs. Adverse outcomes associated with hfTENS may include muscle tightness, headaches, nausea, redness, or burning of the skin. Low frequency TENS does not appear to be superior to placebo and is not recommended.[82–86]

Acupuncture and Acupressure

The application of acupoint stimulation (acupressure and acupuncture), alone or in combination with other therapies, has been the subject of active investigation in recent years. A 2011 Cochrane review provided some evidence for the use of acupuncture in the symptomatic relief of primary dysmenorrhea based on a meta-analysis of 6 randomized trials.[87] Acupuncture was superior to placebo and to Chinese herbs in the relief of menstrual pain. A very recent Cochrane review of acupuncture and acupressure included evidence from 42 RCTs involving 4640 women. The authors commented that all RCTs except 1 were assessed as being at moderate to high risk of bias. The single well-designed trial failed to demonstrate superiority of acupuncture over placebo. The authors concluded that the evidence supporting acupuncture is inconsistent and unreliable.[88]

The authors of a systematic review of acupoint stimulation included pooled data from 25 RCTs. They concluded that these modalities provided benefit but acknowledged that many trials were of low methodological quality.[89] A recent open-label, randomized trial compared acupuncture with COC. In this small trial, symptom relief was superior in the COC group, but COC was associated with more side effects.[90]

Current evidence suggests that the principle application of acupoint stimulation appears to be in women who prefer an alternative or an adjunct to conventional, pharmacological treatment.

Behavioural Interventions

Behavioural interventions used in the treatment of dysmenorrhea include biofeedback, desensitization, Lamaze exercises, hypnotherapy, and relaxation training.[91] A Cochrane review based on 5 randomized trials comparing behavioural therapies with placebo or other treatments reported that the behavioural therapies showed some merit. However, the authors concluded that the results should be viewed with caution because of inconsistency in the reporting of data, small trial size, poor methodological quality, and age of the trials.[92] It would be premature to endorse the use of behavioural therapies as a treatment of choice for primary dysmenorrhea except as an addition to pharmacological therapy.

Topical Heat

An RCT compared the efficacy of topical heat with oral ibuprofen and/or placebo. Heated pads applied to the lower abdomen were superior to placebo and comparable to ibuprofen for pain relief. Faster improvement occurred when heat was applied along with ibuprofen compared with ibuprofen alone.[93] Another randomized trial also showed comparable results with local heat and oral ibuprofen.[94] A topical heat wrap provided significantly better analgesia than did acetaminophen.[95] Local heat and exercise may provide comparable symptomatic relief in adolescents.[96] Because heated pads are easily accessible and inexpensive, they can be recommended for pain relief in primary dysmenorrhea.

Dietary Supplements

An abundance of medicinal herbs and vitamins have been proposed for the treatment of primary dysmenorrhea.

A concerted effort has been made to test the efficacy of these products, and multiple randomized trials are now published. Most trials were conducted in Iran using cohorts of students in their late teens and early 20s. Methodological rigour was hampered by the lack of standardization and incomplete reporting. There were also difficulties with ensuring credible blinding in controlled trials and adequate sample size.

Ginger has been studied in several small, randomized trials that suggest that doses of 750 to 2000 mg during the first 3 to 4 days of menses may have comparable effectiveness to NSAIDs[97,98] and are likely superior to placebo.[99–101] A recent Cochrane review included 27 randomized trials (3101 women) studying dietary supplements for dysmenorrhea. The authors concluded that high-quality evidence is lacking. On the basis of at least 1 RCT, there was some evidence for the efficacy of ginger, fenugreek, fish oil, fish oil plus vitamin B1, valerian, vitamin B1 alone, zataria, and zinc sulphate.[102]

SURGICAL MANAGEMENT

Whereas most women will see their pain improved with medical treatment, especially if amenorrhea is achieved, some will have persisting pain. In these cases, the cause of the pain might not be primary dysmenorrhea. Thorough exploration of other possible etiologies must be performed in order to optimize therapy.[103] Detailed physical examination, including evaluation of the rectovaginal septum, levator ani, and abdominal wall muscles, must be part of the evaluation in order to guide surgical exploration and therapy. Complementary investigations such as pelvic ultrasound and possibly an MRI, a cystoscopy, and/or colonoscopy may help avoid unnecessary laparoscopy. CA-125 testing should be performed in women with adnexal masses.

The timing of laparoscopic investigation and treatment of dysmenorrhea is challenging. Physicians should keep the number of surgeries to a minimum because repeated procedures induce stress and may evolve into the development of other possible pain syndromes such as neuropathic pain and adhesions. The woman's desire for pregnancy must be taken into account. The available evidence suggests that the first surgery for endometriosis may improve fertility,[104] but subsequent surgeries are not associated with the same positive effect. Patients should be encouraged to give a real chance to medical treatment until pregnancy is desired or precise diagnosis becomes essential.

Laparoscopy

Ultimately, a diagnostic laparoscopy may be helpful. Ideally, the surgeon should be ready to proceed simultaneously to treatment if endometriosis, the most frequent pathology associated with dysmenorrhea, is found. Prior to surgery, the desire to preserve fertility must be clearly defined. All options and associated risks must be discussed; a plan should be clearly established that defines procedures to be performed in regard to the presence or absence of anomalies. Informed consent should be obtained for any procedures that will be considered during the surgery, including the risk of complications.

Treatment of Endometriosis

Surgical treatment of endometriosis lesions by excision or ablation reduces dysmenorrhea.[105–107] In 2013, Alkatout et al. published a prospective study of 450 women with symptomatic endometriosis who underwent laparoscopy and then were randomly assigned to medical treatment with gonadotropin-releasing hormone agonists, surgical treatment of lesions alone, or combined surgical treatment with medical treatment.[105] Among them, 78 women with dysmenorrhea underwent isolated surgical treatment and 65% reported relief 1 year after surgery.

Conservative Surgical Procedures

Two methods of pelvic denervation have been described: LUNA and PSN. These procedures can be performed laparoscopically by a properly trained surgeon. Johnson et al. reported that women with dysmenorrhea without endometriosis improved significantly more with LUNA compared with control patients.[106] This improvement was not seen in women with endometriosis. A 2015 Cochrane review[107] concluded that there is some randomized trial evidence that LUNA is effective for treatment of primary dysmenorrhea. However, the results did not differ at 6 months. Zullo et al. studied the effect of the addition of PSN to laparoscopic treatment of endometriosis for dysmenorrhea.[108,109] They found significant improvement with cure rates at 6, 12, and 24 months of 87.3%, 85.7%, and 83.3% with PSN compared with 60.3%, 57.1%, and 53.3% without PSN.

Surgical Options in the Absence of Visual Abnormalities

If anatomy is strictly normal at laparoscopy and there is no evidence of deep infiltrating endometriosis on MRI, few surgical treatment options are available. Hysterectomy, either laparoscopic total or subtotal, is associated with a high degree of patient satisfaction.[110] It addresses primary dysmenorrhea much better than it addresses non-cyclic pelvic pain, which may have myofascial, neuropathic, bladder, or gastrointestinal components. Women should be well counselled about the 7.9% complication rate of hysterectomy for benign conditions[111] and the risk of

persistent pain, occurrence of new myofascial or neuropathic pain, and, of course, irreversible sterilization.

There is some evidence[106,107] that LUNA may be helpful for some patients with primary dysmenorrhea without visual abnormalities at laparoscopy. PSN may also have a place in conservative surgical treatment of primary dysmenorrhea,[112] but the literature mainly addresses women with endometriosis. Endometrial ablation, usually indicated for abnormal uterine bleeding, reduces dysmenorrhea efficiently[113] with lower complication rates than with hysterectomy. Endometrial ablation and long-term contraception may be offered as minimally invasive options to women with dysmenorrhea and menorrhagia who do not desire future fertility.

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