Dysmenorrhoea is a common condition defined as the occurrence of monthly painful cramps at the time of menstruation that are distressing and require some form of treatment to alleviate the pain and to allow continuation of daily activities. Dysmenorrhoea can be either primary or secondary (see Table 1).

Primary dysmenorrhoea usually starts within 6–12 months of menarche, once ovulatory cycles are established. Presentation beyond a year after menarche should give rise to suspicion of secondary dysmenorrhoea. Risk factors for dysmenorrhoea include early age at menarche (<12 years), low body mass index and a family history of dysmenorrhoea.

Typically, pains are crampy and spasmodic, coming on a few hours after the onset of flow and peaking 24–36 hours into the period. They rarely last more than two or three days and can be accompanied by backache, nausea, vomiting and diarrhoea.

In keeping with the definition of primary dysmenorrhoea, abdominal and pelvic examinations are normal. In teenagers that have achieved sexual maturity and report cyclical pain without menses, outflow obstruction such as imperforate hymen or transverse vaginal septum must be considered.

Pathophysiology

The most important cause of primary dysmenorrhoea is thought to be excessive secretion of prostanoids, which induce uterine contractions, thus reducing uterine blood flow leading to uter-
ine hypoxia and pain. The symptoms accompanying primary dysmenorrhoea, i.e. nausea, vomiting and diarrhoea, are typical of prostaglandin adverse effects.

**Secondary dysmenorrhoea**

In contrast to primary dysmenorrhoea, secondary dysmenorrhoea is a consequence of the presence of pelvic pathology. It typically affects patients in their thirties and forties and it may be associated with other symptoms such as dyspareunia (painful sexual intercourse), dyschezia (painful defaecation) and disturbances of the menstrual cycle.

The commonest pathophysiological process involved is endometriosis – the presence of ectopic endometrial tissue in the peritoneal cavity. Adenomyosis (the infiltration of the myometrium by endometrial cells) is often found at the same time as endometriosis and can compound pain during menstruation.²³

Dysmenorrhoea can also occur secondary to previous pelvic infection that led to adhesions that envelop the ovaries and/or occlude the fallopian tubes causing hydrosalpinges. Fibroids cause uterine enlargement and are commonly associated with menorrhagia, which may also cause dysmenorrhoea. Structural abnormalities of the endometrium such as polyps give rise to cycle disturbances and can be accompanied by pain during menstruation.

Rare causes of dysmenorrhoea include uterine anomalies (e.g. unicornuate uterus with a noncommunicating rudimentary uterine cornu) or cervical stenosis.

**Diagnostic approach to dysmenorrhoea**

The starting point in distinguishing between primary and secondary dysmenorrhoea is the patient’s history. Primary dysmenorrhoea affects a younger age group of women and starts soon after the onset of menstruation. The pain is confined to the period and rarely lasts longer than two to three days.

In contrast, secondary dysmenorrhoea usually affects older women, with pain starting before the onset of bleeding and continuing throughout. Secondary dysmenorrhoea is associated with secondary effects of the underlying pathology such as dyspareunia and dyschezia.

While in primary dysmenorrhoea examination will be normal, secondary dysmenorrhoea is by definition associated with significant clinical findings. Pelvic examination in women with endometriosis may reveal a fixed retroverted uterus due to occlusion of the pouch of Douglas and/or the presence of thickened uterosacral ligaments or rectovaginal septum due to endometriotic nodules. The uterus will be enlarged in women with fibroids, and pelvic tenderness may be elicited by gentle palpation in women with pelvic inflammatory disease. Pelvic examination may be inappropriate in teenagers and a trans-abdominal scan may be an alternative.

Pelvic ultrasound is the starting point in the investigation of dysmenorrhoea and recent advances allow the identification of endometriosis, adenomyosis, uterine fibroids and congenital uterine anomalies, all of which are associated with dysmenorrhoea.²³
Medical treatment
A recommended treatment pathway for women presenting with primary or secondary dysmenorrhoea in primary care is shown in Figure 1.

NSAIDs
A large number of NSAIDs have been compared with placebo in terms of their effectiveness in relieving menstrual pain. They have all been found to be effective treatments for dysmenorrhoea except aspirin.5 A recent meta-analysis concluded that between 45–53% of women taking NSAIDs achieved moderate or excellent pain relief compared with 18% of those taking placebo.6 NSAIDs have also been shown to reduce interference with daily activities and school absenteeism in dysmenorrhoea compared with placebo.

In terms of effectiveness in symptom relief, there is little evidence of superiority of one NSAID over another. Choice will depend on their side-effect profile and clinician familiarity. NSAIDs are associated with significant side-effects, although the three-day regimen used when treating primary dysmenorrhoea is unlikely to bring these about. In the pooled results of placebo-controlled randomised trials, gastrointestinal symptoms were the commonest reported side-effects.

More recently, COX-2 inhibitors had been heralded as a potentially more effective treatment for dysmenorrhoea. However, those that have not been withdrawn due to safety concerns have not been shown to be superior to more COX-1 selective agents.

Oral contraceptives
Synthetic hormones and more recently natural oestrogen, which suppress ovulation, improve the symptoms of dysmenorrhoea. Inhibition of ovulation and reduced volume of endometrium at the time of menstruation reduces the amount of prostaglandins produced, thereby relieving menstrual cramps.

In addition to making periods less painful, the combined oral contraceptive can be taken continuously, thereby reducing the number of cycles the patient goes through. Recent evidence suggests that even ultra low-dose preparations of the combined oral contraceptive pill are effective in treating dysmenorrhoea.7 Similarly, injectable progestogens can also be used to induce reversible amenorrhoea, although they are associated with

<table>
<thead>
<tr>
<th>Pathophysiology</th>
<th>Primary dysmenorrhoea</th>
<th>Secondary dysmenorrhoea</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No underlying gynaecological pathology</td>
<td>Pain manifestation of underlying gynaecological pathology</td>
</tr>
<tr>
<td>History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>16–25 years</td>
<td>30–45 years</td>
</tr>
<tr>
<td>Onset</td>
<td>Menarche</td>
<td>After menarche</td>
</tr>
<tr>
<td>Duration</td>
<td>8–72 hours during menses</td>
<td>Prior to onset of menses and throughout menstrual cycle</td>
</tr>
<tr>
<td>Nature</td>
<td>Cramping pelvic pain, with or without nausea and vomiting, which commences with the start of menstrual flow; the pain may radiate to the lower back or upper legs</td>
<td>Variable number of days; noncyclical and cyclical episodes</td>
</tr>
<tr>
<td>Co-morbidity</td>
<td>No other gynaecological, renal tract or gastrointestinal symptoms</td>
<td>Co-existent gynaecological symptoms, eg heavy periods, dyspareunia, vaginal discharge, intermenstrual bleeding, postcoital bleeding, chronic pelvic pain; possible bowel and urological symptoms</td>
</tr>
<tr>
<td>Responds to NSAIDs or COCs</td>
<td>Yes</td>
<td>Yes, but may require further treatment</td>
</tr>
<tr>
<td>Clinical examination</td>
<td>Normal pelvis</td>
<td>Fixed retroverted uterus, thickened uterosacral ligaments, endometriotic nodules on vaginal examination, enlarged tender uterus, adnexal masses</td>
</tr>
<tr>
<td>Specialist investigations</td>
<td>Normal pelvic ultrasound no evidence of pelvic inflammatory disease (PID)</td>
<td>Pelvic ultrasound may show adenomyosis or uterine fibroids, ovarian endometriosis, evidence of PID on genital tract swabs</td>
</tr>
</tbody>
</table>

Table 1. Distinguishing features of primary and secondary dysmenorrhoea
irregular bleeding. Alternative delivery methods for combined oral contraception include transdermal skin patches and vaginal rings, which may be more suited to those for whom daily pill taking is difficult.

The ability of oral combined contraception to relieve menstrual pain has been borne out by placebo-controlled trials that demonstrate significant pain relief with all combined oral contraceptives compared with placebo in women with primary dysmenorrhoea.8

Intrauterine devices
The levonorgestrel-releasing intrauterine system Mirena has been shown to be associated with improved pain scores and reduced menstrual flow in women with adenomyosis and endometriosis. In contrast, the copper IUS may be associated with an increase in menstrual pain.9,10 A smaller frame levonorgestrel-releasing intrauterine system (Jaydess) is also available for use in younger nulliparous women.

Other pharmacological treatments
Agents that bring about myometrial relaxation can be used to relieve primary dysmenorrhoea. However, these agents are not licensed for such use and therefore caution is advised.

Nitric oxide is effective for pain relief compared with placebo, but compared with diclofenac sodium, the glyceryl trinitrate (GTN) patch has reduced efficacy with low tolerability.11 Similar results have been obtained with nifedipine, a calcium-channel blocker.

Beta2-agonists (eg terbutaline oral spray) have also been examined as a treatment for dysmenorrhoea. Overall the evidence supporting their use is very poor and they are associated with significant side-effects, therefore their use is not recommended.12

Nonpharmacological treatments
Various nonpharmacological treatments for dysmenorrhoea have been suggested. There is limited evidence that high-frequency transcutaneous electrical nerve stimulation (TENS) is effective in reducing menstrual pain. A meta-analysis of randomised controlled trials found that behaviour modification techniques, eg pain management training and relaxation plus biofeedback, may help with pain but the evidence is limited and the results not conclusive.13

A meta-analysis on acupuncture for the treatment of primary dysmenorrhoea has recently been published. The results are conflicting as studies comparing acupuncture to sham or placebo did not show benefit but when compared to NSAIDs, acupuncture was associated with significant improvements in visual analogue pain scores. Acupuncture also had a favourable adverse event profile compared to NSAIDs, as expected.14

Figure 1. Treatment pathway for women presenting with dysmenorrhoea in primary care

COC = combined oral contraceptive
A large number of dietary supplements have been examined for effectiveness in the treatment of dysmenorrhoea, but none have shown a significant effect. High-dose vitamin D supplementation has shown some promise in a randomised controlled trial and could be tried alongside other approaches. The evidence on spine manipulation and herbal medicine remains inconclusive due to poor-quality data and therefore these treatments cannot be recommended.

When to refer

The detection of significant pelvic pathology that is refractory to first- and second-line treatment options should prompt referral to secondary care where definitive, often surgical, treatment can be discussed for endometriosis, adenomyosis and fibroids.

It has been reported that 50–70% of teenagers who do not respond to medical treatments with NSAIDs and the combined oral contraceptive have pelvic endometriosis and such patients will benefit from specialist review.

References


Guidance
NICE Evidence Search. An aggregator website with the latest evidence and guidance on a range of topics, including dysmenorrhea. www.evidence.nhs.uk/topic/dysmenorrhoea

Further resources
Royal College of Obstetricians and Gynaecologists. The college publishes a series of leaflets and has a patient information section. www.rcog.org.uk
National Association for Premenstrual Syndrome. A patient support group with an online forum and frequently asked questions section. www.pms.org.uk
Women’s Health Concern. The patient arm of the British Menopause Society, providing advice and education for women of all ages regarding health and lifestyle issues. www.womens-health-concern.org

Declaration of interests
Dr Saridogan has received honoraria for provision of training to healthcare professionals from Olympus, Ethicon, Fanning and Gedeon Richter.

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