

REVIEW

Dysmenorrhea and related disorders [version 1; referees: 3 approved]

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v1 First published: 05 Sep 2017, 6(F1000 Faculty Rev):1645 (doi: 10.12688/f1000research.11682.1)




Latest published: 05 Sep 2017, 6(F1000 Faculty Rev):1645 (doi: 10.12688/f1000research.11682.1)

Abstract

Dysmenorrhea is a common symptom secondary to various gynecological disorders, but it is also represented in most women as a primary form of disease. Pain associated with dysmenorrhea is caused by hypersecretion of prostaglandins and an increased uterine contractility. The primary dysmenorrhea is quite frequent in young women and remains with a good prognosis, even though it is associated with low quality of life. The secondary forms of dysmenorrhea are associated with endometriosis and adenomyosis and may represent the key symptom. The diagnosis is suspected on the basis of the clinical history and the physical examination and can be confirmed by ultrasound, which is very useful to exclude some secondary causes of dysmenorrhea, such as endometriosis and adenomyosis. The treatment options include non-steroidal anti-inflammatory drugs alone or combined with oral contraceptives or progestins.

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Referee Status: 

	Invited Referees		
	1	2	3
version 1 published 05 Sep 2017			

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Competing interests: The authors declare that they have no competing interests.

How to cite this article: Bernardi M, Lazzeri L, Perelli F *et al.* Dysmenorrhea and related disorders [version 1; referees: 3 approved] F1000Research 2017, 6(F1000 Faculty Rev):1645 (doi: 10.12688/f1000research.11682.1)

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Grant information: The author(s) declared that no grants were involved in supporting this work.

First published: 05 Sep 2017, 6(F1000 Faculty Rev):1645 (doi: 10.12688/f1000research.11682.1)

Introduction

Dysmenorrhea is defined as the presence of painful cramps of uterine origin that occur during menstruation and represents one of the most common causes of pelvic pain and menstrual disorder. The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”¹. In particular, chronic pelvic pain is located in the pelvic area and lasts for 6 months or longer².

The burden of dysmenorrhea is greater than any other gynecological complaint³; dysmenorrhea is the leading cause of gynecological morbidity in women of reproductive age regardless of age, nationality, and economic status^{4–7}. The effects extend beyond individual women to society, resulting annually in an important loss of productivity^{8,9}. Thus, the World Health Organization estimated that dysmenorrhea is the most important cause of chronic pelvic pain¹⁰.

The estimated prevalence of dysmenorrhea is high, although it varies widely, ranging from 45 to 93% of women of reproductive age^{3,10}, and the highest rates are reported in adolescents^{11,12}. Because it is accepted as a normal aspect of the menstrual cycle and therefore is tolerated, women do not report it¹³ and do not seek medical care^{13,14}. Some women (3 to 33%) have very severe pain, severe enough to render them incapacitated for 1 to 3 days each menstrual cycle, requiring absence from school or work^{15,16}. Indeed, dysmenorrhea has a high impact on women’s lives, resulting in a restriction of daily activities^{17,18}, a lower academic performance in adolescents^{19,20}, and poor quality of sleep²¹, and has negative effects on mood, causing anxiety and depression²².

Definition and pathogenesis

On the basis of pathophysiology, dysmenorrhea is classified as primary dysmenorrhea (menstrual pain without organic disease) or secondary dysmenorrhea (menstrual pain associated with underlying pelvic pathology)²³. The cause of primary dysmenorrhea is not well established. However, the responsible cause has been identified on the hyper-production of uterine prostaglandins, particularly of PGF_{2α} and PGF₂, thus resulting in increased uterine tone and high-amplitude contractions²⁴. Women with dysmenorrhea have higher levels of prostaglandins, which are highest during the first two days of menses²⁵. Prostaglandin production is controlled by progesterone: when progesterone levels drop, immediately prior to menstruation, prostaglandin levels increase^{13,24}. If the exposure of endometrium to luteal phase is crucial for the increased production of progesterone, dysmenorrhea occurs only with ovulatory cycles. This could explain why primary dysmenorrhea onset is shortly after menarche and why dysmenorrhea responds well to ovulatory inhibition. However, multiple other factors may play a role in the perception and the severity of pain, which does not depend only on endocrine factors²⁶.

The recurrent menstrual pain is associated with central sensitization, which is associated with structural and functional modification of the central nervous system^{24,27}. Given that dysmenorrhea might lead to important long-term consequences and may be increasing women’s susceptibility to others chronic pain conditions later in

life, it is mandatory to treat menstrual pain in order to limit the noxious input into the central nervous system²⁴. The most common causes of secondary dysmenorrhea in young women are endometriosis and adenomyosis.

Endometriosis

Endometriosis is characterized by the presence of endometrial tissue (glands and stroma) outside the uterine cavity and is the most common cause of secondary dysmenorrhea^{27,28}. Pain symptoms negatively influence physical and psychological well-being of women with endometriosis. All forms of pain induce elevated sympathetic nervous system activity and this is considered a stressor, inducing changes in neuromediators, neuroendocrine, and hormonal secretions^{27,29}.

Given that women with endometriosis wait before getting the right diagnosis³⁰, a great deal of effort has been made in recent years to try to find signs and symptoms that would help in making an earlier diagnosis. The early identification of these symptoms could help reduce the delay necessary for diagnosis¹⁵ and enable the use of less invasive procedures³¹. An early age onset of dysmenorrhea is considered a risk factor for endometriosis³²; other menstrual characteristics such as cycle length and menstrual bleeding duration and quantity are not related to the development of endometriosis. Parameters that may predict a later finding of deep infiltrating endometriosis are prolonged use of oral contraceptives (OCs) for treating primary dysmenorrhea, absenteeism from school during menstruation, and a positive family history of dysmenorrhea³³.

The endometriosis prevalence is higher in adolescents with chronic pelvic pain resistant to treatment with OC pills and non-steroidal anti-inflammatory drugs (NSAIDs) and in girls with dysmenorrhea³⁴. Therefore, severe dysmenorrhea that does not respond to medical therapy warrants further investigation such as by laparoscopy³⁵.

Adenomyosis

Adenomyosis is defined as the presence of endometrial glands and stroma within the myometrium and is associated with dysmenorrhea and abnormal uterine bleeding (AUB). Adenomyosis is one of the most common causes of AUB³⁶. The diagnosis is usually confirmed through transvaginal ultrasonography and magnetic resonance imaging. Via specific ultrasonographic criteria by bidimensional and tridimensional transvaginal ultrasound (morphological uterus sonographic assessment)³⁷, the detection of adenomyosis features by imaging is accepted and the association with menstrual pain, heavy menstrual bleeding, and infertility may facilitate the diagnosis of adenomyosis³⁸. A 34% incidence of adenomyosis ultrasonographic features is found in young nulligravid women 18 to 30 years of age and is associated with dysmenorrhea³⁹.

Risk factors

Heavy menstrual bleeding and longer menstrual bleeding duration are often associated with dysmenorrhea^{3,20}. Childbearing is a very influential factor for the decrease of dysmenorrhea⁵. Increasing age is also associated with less severe dysmenorrhea¹², although a longitudinal study found that the proportion of women with moderate to severe dysmenorrhea remained constant with increasing age⁵.

The early onset of pain is associated with more severe pain³, and a family history of dysmenorrhea is associated with a significantly higher prevalence of dysmenorrhea²⁰. Since anxiety and depression are often associated, dysmenorrhea may be part of a somatoform syndrome³.

Diagnosis

A focused history and physical examination are usually sufficient for making a diagnosis of primary dysmenorrhea^{23,26}. The onset of primary dysmenorrhea is usually 6 to 12 months after menarche. The typical pain is sharp and intermittent, is located in the suprapubic area, and develops within hours of the start of menstruation and peaks with maximum blood flow²³. The physical examination is completely normal, and the menstrual pain may be associated with

systemic symptoms, such as nausea, vomiting, diarrhea, fatigue, fever, headache, and insomnia^{11,16,40}. There is no evidence for routine use of ultrasound in the evaluation of primary dysmenorrhea, although ultrasound is very useful in excluding the secondary causes of dysmenorrhea, such as endometriosis and adenomyosis²⁶ (Figure 1).

Dysmenorrhea that occurs any time after menarche, that is associated with other gynecological symptoms such as dyspareunia, heavy menstrual bleeding, AUB, and infertility, and that does not respond to treatment with NSAIDs or OCs might be suspicious for secondary dysmenorrhea^{23,24}. In particular, the analysis of menstrual bleeding abnormalities associated with dysmenorrhea might be helpful for the diagnosis of adenomyosis (Figure 1).

Management of dysmenorrhea

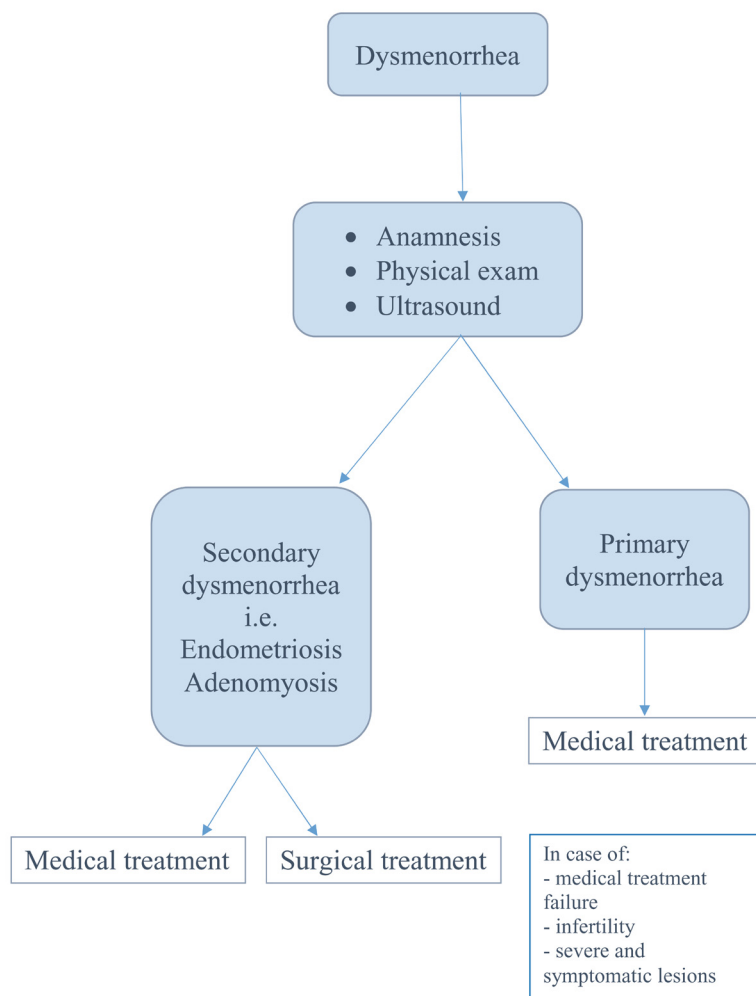


Figure 1. Flowchart for the management of patients with dysmenorrhea. Flowchart for the management of patients with dysmenorrhea.

Treatment

The aim of the treatment for primary dysmenorrhea is pain relief.

Non-steroidal anti-inflammatory drugs

NSAIDs are usually the first-line therapy for dysmenorrhea and should be tried for at least three menstrual periods^{41,42}. If NSAIDs alone are not sufficient, OCs can be combined with it. NSAIDs are drugs that act by blocking prostaglandin production through the inhibition of cyclooxygenase, an enzyme responsible for formation of prostaglandins. Common NSAIDs (aspirin, naproxen, and ibuprofen) are very effective in relieving period pain⁴³. They make the menstrual cramps less severe and can prevent other symptoms such as nausea and diarrhea⁴⁴. NSAIDs reduce moderate to severe pain in women with primary dysmenorrhea²³. With the widespread availability of NSAIDs, the management of dysmenorrhea is mainly self-care^{13,18}.

Oral contraceptives

Contraceptive hormones act by suppressing ovulation and causing no endometrial proliferation¹³. OCs bring almost immediate relief from symptoms associated with menstruation: heavy periods, painful periods, and irregular bleeding. In addition, OCs often are used as therapeutic drugs for women with symptomatic menorrhagia or endometriosis^{45,46}.

The effectiveness of OC therapy for treating dysmenorrhea, regardless of the administration route (oral, transdermal, intravaginal, or intrauterine), has been shown^{12,46–51}. The use of OCs in a continuous fashion can be considered to treat primary dysmenorrhea, with two main advantages: the reduction of associated menstrual disorders and the improvement in women's pain relief²⁶. However, limited evidence supports the use of OCs as a standard treatment²³.

The choice between the use of combined OCs and oral progesterone should be guided by the patient's pain relief, the toleration of possible adverse effects especially linked to the frequency of breakthrough bleeding and weight gain, and the patient's basal risk of venous thromboembolism⁵².

Progestins

Hormonal progestins-only treatment produces a benefit on menstrual pain, causing endometrial atrophy and inhibiting ovulation. Several long-acting reversible progestin contraceptives have been found to be effective treatments for primary dysmenorrhea. These include 52-mg (20 µg/day) levonorgestrel-releasing intrauterine system, the etonogestrel-releasing subdermal implant, and depot medroxyprogesterone⁵³.

Author contributions

MB helped to carry out the research and to prepare the first draft of the manuscript. LL designed the study, helped to carry out the research, and helped to prepare the first draft of the manuscript. F Perelli helped to carry out the research and contributed to the preparation of the manuscript. FMR contributed to the research, provided expertise in the literature review, and contributed to the preparation of the manuscript. F Petraglia conceived the study and contributed to the preparation of the manuscript. All authors were involved in the revision of the draft manuscript and have agreed to the final content.

Competing interests

The authors declare that they have no competing interests.

Grant information

The author(s) declared that no grants were involved in supporting this work.

References

1. Hanoch Kumar K, Elavarasi P: **Definition of pain and classification of pain disorders.** *Journal of Advanced Clinical & Research Insight.* 2016; **3**: 87–90. [PubMed Abstract](#) [Publisher Full Text](#)
2. ACOG Committee on Practice Bulletins—Gynecology: **ACOG Practice Bulletin No. 51. Chronic pelvic pain.** *Obstet Gynecol.* 2004; **103**(3): 589–605. [PubMed Abstract](#)
3. Patel V, Tanksale V, Sahasrabhojane M, et al.: **The burden and determinants of dysmenorrhoea: a population-based survey of 2262 women in Goa, India.** *BJOG.* 2006; **113**(4): 453–63. [PubMed Abstract](#) [Publisher Full Text](#)
4. Harlow SD, Campbell OM: **Epidemiology of menstrual disorders in developing countries: a systematic review.** *BJOG.* 2004; **111**(1): 6–16. [PubMed Abstract](#) [Publisher Full Text](#)
5. Weissman AM, Hartz AJ, Hansen MD, et al.: **The natural history of primary dysmenorrhoea: a longitudinal study.** *BJOG.* 2004; **111**(4): 345–52. [PubMed Abstract](#) [Publisher Full Text](#)
6. Wong LP, Khoo EM: **Dysmenorrhoea in a multiethnic population of adolescent Asian girls.** *Int J Gynaecol Obstet.* 2010; **108**(2): 139–42. [PubMed Abstract](#) [Publisher Full Text](#)
7. De Sanctis V, Soliman A, Bernasconi S, et al.: **Primary Dysmenorrhea in Adolescents: Prevalence, Impact and Recent Knowledge.** *Pediatr Endocrinol Rev.* 2015; **13**(2): 512–20. [PubMed Abstract](#)
8. Thomas SL, Ellertson C: **Nuisance or natural and healthy: should monthly menstruation be optional for women?** *Lancet.* 2000; **355**(9207): 922–4. [PubMed Abstract](#) [Publisher Full Text](#)
9. Eryilmaz G, Ozdemir F, Pasinlioglu T: **Dysmenorrhoea prevalence among adolescents in eastern Turkey: its effects on school performance and relationships with family and friends.** *J Pediatr Adolesc Gynecol.* 2010; **23**(5): 267–72. [PubMed Abstract](#) [Publisher Full Text](#)
10. Latthe P, Latthe M, Say L, et al.: **WHO systematic review of prevalence of chronic pelvic pain: a neglected reproductive health morbidity.** *BMC Public Health.* 2006; **6**: 177. [PubMed Abstract](#) [Publisher Full Text](#) [Free Full Text](#)
11. Parker MA, Sneddon AE, Arbon P: **The menstrual disorder of teenagers (MDOT) study: determining typical menstrual patterns and menstrual disturbance in a large population-based study of Australian teenagers.** *BJOG.* 2010; **117**(2): 185–92. [PubMed Abstract](#) [Publisher Full Text](#)
12. Lindh I, Ellström AA, Milsom I: **The effect of combined oral contraceptives and age on dysmenorrhoea: an epidemiological study.** *Hum Reprod.* 2012; **27**(3):

676–82.

[PubMed Abstract](#) | [Publisher Full Text](#)

13. Wong CL, Farquhar C, Roberts H, *et al.*: **Oral contraceptive pill for primary dysmenorrhoea.** *Cochrane Database Syst Rev.* 2009; (4): CD002120.
[PubMed Abstract](#) | [Publisher Full Text](#)
14. Subasinghe AK, Hapoo L, Jayasinghe YL, *et al.*: **Prevalence and severity of dysmenorrhoea, and management options reported by young Australian women.** *Aust Fam Physician.* 2016; **45**(11): 829–34.
[PubMed Abstract](#)
15. Zannoni L, Giorgi M, Spagnolo E, *et al.*: **Dysmenorrhea, absenteeism from school, and symptoms suspicious for endometriosis in adolescents.** *J Pediatr Adolesc Gynecol.* 2014; **27**(5): 258–65.
[PubMed Abstract](#) | [Publisher Full Text](#)
16. Ortiz MI, Rangel-Flores E, Carrillo-Alarcón LC, *et al.*: **Prevalence and impact of primary dysmenorrhea among Mexican high school students.** *Int J Gynaecol Obstet.* 2009; **107**(3): 240–3.
[PubMed Abstract](#) | [Publisher Full Text](#)
17. Chantler I, Mitchell D, Fuller A: **Actigraphy quantifies reduced voluntary physical activity in women with primary dysmenorrhea.** *J Pain.* 2009; **10**(1): 38–46.
[PubMed Abstract](#) | [Publisher Full Text](#)
18. Banikarim C, Chacko MR, Kelder SH: **Prevalence and impact of dysmenorrhea on Hispanic female adolescents.** *Arch Pediatr Adolesc Med.* 2000; **154**(12): 1226–9.
[PubMed Abstract](#) | [Publisher Full Text](#)
19. **F** Hailemeskel S, Demissie A, Assefa N: **Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: evidence from female university students in Ethiopia.** *Int J Womens Health.* 2016; **8**: 489–96.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#) | [F1000 Recommendation](#)
20. Unsal A, Ayranci U, Tozun M, *et al.*: **Prevalence of dysmenorrhea and its effect on quality of life among a group of female university students.** *Ups J Med Sci.* 2010; **115**(2): 138–45.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
21. Baker FC, Driver HS, Rogers GG, *et al.*: **High nocturnal body temperatures and disturbed sleep in women with primary dysmenorrhea.** *Am J Physiol.* 1999; **277**(6 Pt 1): E1013–21.
[PubMed Abstract](#)
22. Dorn LD, Negriff S, Huang B, *et al.*: **Menstrual symptoms in adolescent girls: association with smoking, depressive symptoms, and anxiety.** *J Adolesc Health.* 2009; **44**(3): 237–43.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
23. **F** Proctor M, Farquhar C: **Diagnosis and management of dysmenorrhoea.** *BMJ.* 2006; **332**(7550): 1134–8.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#) | [F1000 Recommendation](#)
24. **F** Iacovides S, Avidon I, Baker FC: **What we know about primary dysmenorrhea today: a critical review.** *Hum Reprod Update.* 2015; **21**(6): 762–78.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
25. Dawood MY: **Primary dysmenorrhea: advances in pathogenesis and management.** *Obstet Gynecol.* 2006; **108**(2): 428–41.
[PubMed Abstract](#) | [Publisher Full Text](#)
26. Lefebvre G, Pinsonneault O, Antao V, *et al.*: **Primary dysmenorrhea consensus guideline.** *J Obstet Gynaecol Can.* 2005; **27**(12): 1117–46.
[PubMed Abstract](#) | [Publisher Full Text](#)
27. **F** Brawn J, Morotti M, Zondervan KT, *et al.*: **Central changes associated with chronic pelvic pain and endometriosis.** *Hum Reprod Update.* 2014; **20**(5): 737–47.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#) | [F1000 Recommendation](#)
28. Bulun SE: **Endometriosis.** *N Engl J Med.* 2009; **360**(3): 268–79.
[PubMed Abstract](#) | [Publisher Full Text](#)
29. **F** Morotti M, Vincent K, Brawn J, *et al.*: **Peripheral changes in endometriosis-associated pain.** *Hum Reprod Update.* 2014; **20**(5): 717–36.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#) | [F1000 Recommendation](#)
30. Arruda MS, Petta CA, Abrão MS, *et al.*: **Time elapsed from onset of symptoms to diagnosis of endometriosis in a cohort study of Brazilian women.** *Hum Reprod.* 2003; **18**(4): 756–9.
[PubMed Abstract](#) | [Publisher Full Text](#)
31. Chapron C, Borghese B, Streuli I, *et al.*: **Markers of adult endometriosis detectable in adolescence.** *J Pediatr Adolesc Gynecol.* 2011; **24**(5 Suppl): S7–12.
[PubMed Abstract](#) | [Publisher Full Text](#)
32. Treloar SA, Bell TA, Nagle CM, *et al.*: **Early menstrual characteristics associated with subsequent diagnosis of endometriosis.** *Am J Obstet Gynecol.* 2010; **202**(6): 534.e1–6.
[PubMed Abstract](#) | [Publisher Full Text](#)
33. Chapron C, Lafay-Pillet MC, Monceau E, *et al.*: **Questioning patients about their adolescent history can identify markers associated with deep infiltrating endometriosis.** *Fertil Steril.* 2011; **95**(3): 877–81.
[PubMed Abstract](#) | [Publisher Full Text](#)
34. Crosignani P, Olive D, Bergqvist A, *et al.*: **Advances in the management of endometriosis: an update for clinicians.** *Hum Reprod Update.* 2006; **12**(2): 179–89.
[PubMed Abstract](#) | [Publisher Full Text](#)
35. **F** Janssen EB, Rijkers AC, Hoppenbrouwers K, *et al.*: **Prevalence of endometriosis diagnosed by laparoscopy in adolescents with dysmenorrhea or chronic pelvic pain: a systematic review.** *Hum Reprod Update.* 2013; **19**(5): 570–82.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
36. Munro MG, Critchley HO, Broder MS, *et al.*: **FIGO classification system (PALM-COEN) for causes of abnormal uterine bleeding in nonpregnant women of reproductive age.** *Int J Gynaecol Obstet.* 2011; **113**(1): 3–13.
[PubMed Abstract](#) | [Publisher Full Text](#)
37. van den Bosch T, Dueholm M, Leone FP, *et al.*: **Terms, definitions and measurements to describe sonographic features of myometrium and uterine masses: a consensus opinion from the Morphological Uterus Sonographic Assessment (MUSA) group.** *Ultrasound Obstet Gynecol.* 2015; **46**(3): 284–98.
[PubMed Abstract](#) | [Publisher Full Text](#)
38. **F** Naftalin J, Hoo W, Nunes N, *et al.*: **Association between ultrasound features of adenomyosis and severity of menstrual pain.** *Ultrasound Obstet Gynecol.* 2016; **47**(6): 779–83.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
39. Pinzauti S, Lazzeri L, Tosti C, *et al.*: **Transvaginal sonographic features of diffuse adenomyosis in 18–30-year-old nulligravid women without endometriosis: association with symptoms.** *Ultrasound Obstet Gynecol.* 2015; **46**(6): 730–6.
[PubMed Abstract](#) | [Publisher Full Text](#)
40. Eryilmaz G, Ozdemir F, Pasinlioglu T: **Dysmenorrhea prevalence among adolescents in eastern Turkey: its effects on school performance and relationships with family and friends.** *J Pediatr Adolesc Gynecol.* 2010; **23**(5): 267–72.
[PubMed Abstract](#) | [Publisher Full Text](#)
41. Zahradnik HP, Hanjalic-Beck A, Groth K: **Nonsteroidal anti-inflammatory drugs and hormonal contraceptives for pain relief from dysmenorrhea: a review.** *Contraception.* 2010; **81**(3): 185–96.
[PubMed Abstract](#) | [Publisher Full Text](#)
42. Harel Z: **Dysmenorrhea in adolescents and young adults: an update on pharmacological treatments and management strategies.** *Expert Opin Pharmacother.* 2012; **13**(15): 2157–70.
[PubMed Abstract](#) | [Publisher Full Text](#)
43. **F** Marjoribanks J, Ayeleke RO, Farquhar C, *et al.*: **Nonsteroidal anti-inflammatory drugs for dysmenorrhoea.** *Cochrane Database Syst Rev.* 2015; (7): CD001751.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
44. American College of Obstetricians and Gynecologists: **ACOG Committee Opinion. Number 310, April 2005. Endometriosis in adolescents.** *Obstet Gynecol.* 2005; **105**(4): 921–7.
[PubMed Abstract](#)
45. ESHRE Capri Workshop Group: **Noncontraceptive health benefits of combined oral contraception.** *Hum Reprod Update.* 2005; **11**(5): 513–25.
[PubMed Abstract](#) | [Publisher Full Text](#)
46. **F** Dunselman GA, Vermeulen N, Becker C, *et al.*: **ESHRE guideline: management of women with endometriosis.** *Hum Reprod.* 2014; **29**(3): 400–12.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
47. Brill K, Norpoth T, Schnitker J, *et al.*: **Clinical experience with a modern low-dose oral contraceptive in almost 100,000 users.** *Contraception.* 1991; **43**(2): 101–10.
[PubMed Abstract](#) | [Publisher Full Text](#)
48. **F** Harada T, Momoeda M, Taketani Y, *et al.*: **Low-dose oral contraceptive pill for dysmenorrhea associated with endometriosis: a placebo-controlled, double-blind, randomized trial.** *Fertil Steril.* 2008; **90**(5): 1583–8.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
49. **F** Harada T, Momoeda M, Terakawa N, *et al.*: **Evaluation of a low-dose oral contraceptive pill for primary dysmenorrhea: a placebo-controlled, double-blind, randomized trial.** *Fertil Steril.* 2011; **95**(6): 1928–31.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
50. **F** Harada T, Momoeda M: **Evaluation of an ultra-low-dose oral contraceptive for dysmenorrhea: a placebo-controlled, double-blind, randomized trial.** *Fertil Steril.* 2016; **106**(7): 1807–14.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
51. **F** Priya K, Rajaram S, Goel N: **Comparison of combined hormonal vaginal ring and low dose combined oral hormonal pill for the treatment of idiopathic chronic pelvic pain: a randomised trial.** *Eur J Obstet Gynecol Reprod Biol.* 2016; **207**: 141–6.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
52. **F** Vercellini P, Buggio L, Berlanda N, *et al.*: **Estrogen-progestins and progestins for the management of endometriosis.** *Fertil Steril.* 2016; **106**(7): 1552–1571.e2.
[PubMed Abstract](#) | [Publisher Full Text](#) | [F1000 Recommendation](#)
53. Ryan SA: **The Treatment of Dysmenorrhea.** *Pediatr Clin North Am.* 2017; **64**(2): 331–42.
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Competing Interests: No competing interests were disclosed.
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Competing Interests: No competing interests were disclosed.
-