

## Review Article

# Dysmenorrhea in Adolescents: How to approach: A Review Article

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### Abstract:

*Dysmenorrhea refers to recurrent pelvic pain during menstruation in sufficient magnitude, which incapacitates a woman's day-to-day activities. It is the most common gynecological complaint among adolescents. It negatively impacts their quality of life, attendance at school or work and mental health. Most adolescents experiencing dysmenorrhea have primary dysmenorrhea without having any pelvic pathology. If a girl does not feel clinical improvement within 3-6 months of empiric treatment with nonsteroidal anti-inflammatory drugs, secondary dysmenorrhea should be kept in mind and exploration of the cause of secondary dysmenorrhea should be done. Our objective was to review the current knowledge regarding the pathophysiology of dysmenorrhea and to summarize the approach in the diagnosis and management in specific adolescent groups. We selected adolescents as their psychosomatic factors like anxiety, tension adversely influence their pain threshold. We reviewed the recent article written on dysmenorrhea, which has been published in different medical literature. At the same time, different guidelines and treatment protocols have been reviewed. Adolescents are more vulnerable to dysmenorrhea. They are suffering mostly from primary dysmenorrhea, but pelvic pathology should be kept in mind, especially endometriosis and Mullerian abnormalities. Non-steroidal anti-inflammatory drugs (NSAIDs) and oral contraceptive pills (OCP) are the first-line treatment. Special emphasis should be given to improving their mental strength.*

**Key words:** Adolescents, Dysmenorrhea.

### Introduction:

The term dysmenorrhea is derived from the Greek word "Dys"- means difficult/bothersome, "Meno"- means month and "Rhea"-means flow<sup>1</sup>. Dysmenorrhea, a painful menstruation which is the most common gynecological condition in adolescent girls and is a major physical and mental health concern. The reported prevalence range varies widely from 17-90%<sup>2</sup>. Most adolescents suffering from dysmenorrhea have a

characteristic of primary dysmenorrhea without any pelvic pathology<sup>3</sup>. Secondary dysmenorrhea refers to painful menstruation with definitive pelvic pathology, most commonly pelvic endometriosis<sup>3</sup>. The incidence of secondary dysmenorrhea is about 10%<sup>1</sup>.

Dysmenorrhea is less common during the first 2-3 years after menarche because in this period, the menstrual

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cycle is mostly anovulatory<sup>3</sup>. About 15% of adolescents complain of severe pain during menstruation, adversely affecting their quality of life<sup>4</sup>. These adolescents usually miss 1-3 days of school per menstrual cycle, which lowers their academic performances and causes various

types of psychological changes like anxiety and depression. At the same time, psychologically, they are not strong enough to tolerate the pain and continue their daily activities. It is proven that these adolescent girls can manage this pain gradually with their increasing age when they become independent.

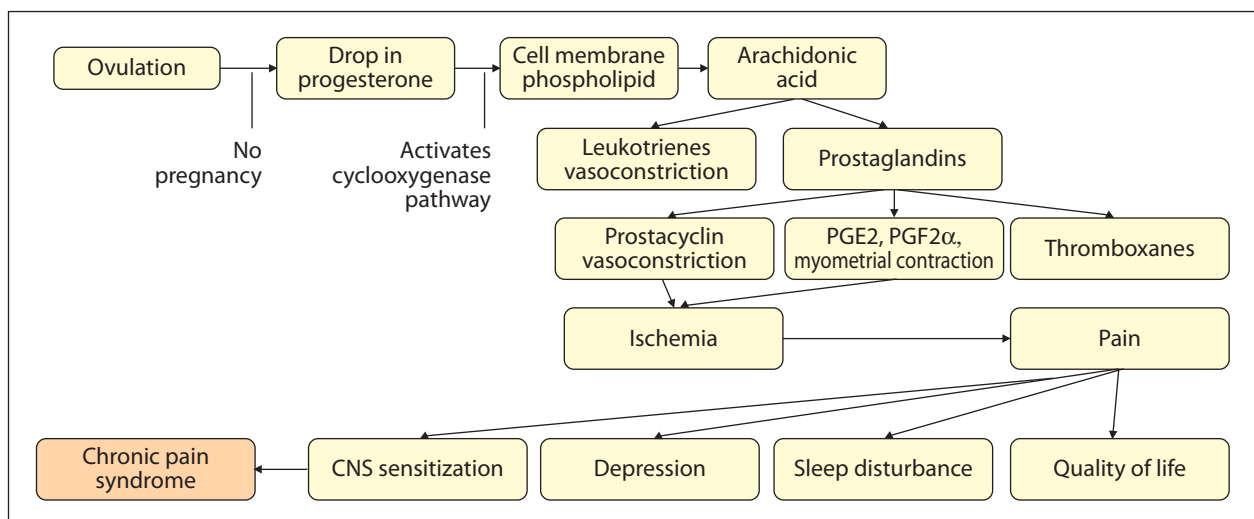
First line treatment of dysmenorrhea is NSAIDs and combined oral contraceptive pills. But dysmenorrhea is often underreported and under-treated. Adequate management of dysmenorrhea can improve the quality of life as well as minimize financial and academic burdens for many girls<sup>2</sup>.

### Pathophysiology of Primary dysmenorrhea:

Anovulatory cycles are usually not associated with pain. In puberty after menarche, 6-12 menstrual cycles are usually anovulatory. So, the girls are not complaining of

pain during menstruation. When the cycle becomes ovulatory, after ovulation, there is an increase of fatty acid buildup in the phospholipid of the cell membrane. After progesterone withdrawal, phospholipids from the dead cell membranes are converted to Arachidonic acid (AA), which is metabolized by lipoxygenase and cyclooxygenase producing leukotrienes (LTs) and prostaglandins (PGs).  $\text{PGF}_2\alpha$  and  $\text{PGE}_2$  are mainly responsible for pain and other symptoms associated with dysmenorrhoea<sup>4</sup>.

$\text{PGF}_2\alpha$  mediates pain sensation and stimulates smooth muscle contraction, whereas  $\text{PGE}_2$  potentiates platelet disaggregation and vasodilation, producing cramping pain and systemic symptoms such as nausea, bloating and headache<sup>4</sup>.  $\text{PGF}_2\alpha$  and COX metabolites of AA cause potent vasoconstriction and myometrial contractions, leading to uterine ischemia and pain<sup>4</sup>.



**Figure 1:** Pathophysiology of primary dysmenorrhoea

### Classical symptoms of primary dysmenorrhea:

1. Dysmenorrhea begins after 6-12 months after menarche.
2. Pain starts 1-2 days before menstruation or with the onset of menstruation.
3. Criteria of pain: starts in the lower abdomen but can radiate to the back or inner aspect of the thigh.
4. Pain is episodic and cramping in nature.
5. The pain usually subsided after 72 hours.
6. Pain is usually typical in each cycle.
7. Additional symptoms include nausea, vomiting, fatigue, headache, dizziness and sleep disturbance.

### Risk factors for developing dysmenorrhea<sup>2</sup>:

1. Menarche before 12 years of age.
2. Family history of dysmenorrhea.
3. Presence of heavy menstruation or irregular menstruation.
4. Premenstrual symptoms.
5. Stress and depression.
6. Clinically suspected pelvic inflammatory disease.
7. Sexual abuse.
8. Low body mass index.

**How to approach to manage dysmenorrhea:**

An adolescent girl presenting with dysmenorrhea should be handled with empathy. They are psychologically labile, hesitate to explain their complaints and are refractory to advice. At first, a brief history should be taken regarding menstruation and other related factors. During history taking, adequate privacy and confidentiality should be maintained.

**Medical history to evaluate patients with dysmenorrhea<sup>5</sup>:****1. Menstrual history**

- Onset of menarche.
- Onset and characteristics of dysmenorrhea (Including timing of pain during menstruation cycle, radiation and frequency of pain).
- Duration of menstruation.
- Amount of bleeding.
- Irregular or regular pattern of menstruation.
- Previous treatment methods and response.

**2. Sexual history**

- Whether she is sexually active or not.
- Features suggestive of sexually transmitted disease.
- Use of contraception.
- History of sexual abuse or assault.

**3. Associated symptoms**

- Fever, mucopurulent vaginal discharge.
- Deep dyspareunia.
- Urinary: dysuria, hematuria, frequency, urgency.
- Gastrointestinal: vomiting, diarrhea, bloody stools, weight loss, constipation.
- Musculoskeletal: focal abdominal tenderness, recent strain or participation in sports.

**4. Family history of endometriosis/adenomyosis****5. Impact of dysmenorrhea**

- The extent of impairment of work, school and activities.

**6. Psychosocial history**

- Mental health (anxiety, depression).
- Substance abuse.

**Red flags to look out for<sup>5</sup>:**

- Dysmenorrhea not responding to first-line treatment with NSAIDs or OCP.
- Patients in whom dysmenorrhea started within 2 years of menarche.
- Pelvic mass on abdominal, rectal or vaginal examination.

- Symptoms suggestive of secondary dysmenorrhea, abnormal uterine bleeding (menorrhagia and intermenstrual bleeding), mid-cycle or acyclical pain, deep dyspareunia, subfertility, and mucopurulent vaginal discharge.
- Family history of endometriosis and adenomyosis.
- Renal, spinal, cardiac or gastrointestinal anatomical anomalies which may be associated with female genital organ structural abnormalities.

**Differential diagnosis of dysmenorrhea<sup>6, 7</sup>:****1. Primary dysmenorrhea****2. Secondary dysmenorrhea**

- Endometriosis
- Adenomyosis
- Uterine myoma
- Endometrial polyp
- Cervical stenosis
- Obstructive malformation of the genital tract

**3. Other causes of pain**

- Chronic pelvic inflammatory disease
- Irritable bowel syndrome
- Inflammatory bowel disease
- Interstitial cystitis

**4. Sudden onset of dysmenorrhea**

- Acute pelvic inflammatory diseases
- Ectopic pregnancy
- Abortion

Considering the differential diagnosis of dysmenorrhea, there are some recommendations of the Society of Obstetricians and Gynaecologists of Canada (SOGC) clinical practice guideline – primary dysmenorrhea consensus guideline.

**Physical examination<sup>7</sup>:**

- Routine per-abdominal examination should be done.
- Pelvic examination:
  - o A routine pelvic examination is deferred if the girl is not sexually active.
  - o Some anatomical abnormalities can be seen on visual inspection, like an imperforated hymen or a fenestrated hymen. A vaginal septum can be identified with the insertion of a cotton-tipped swab into the vagina. A per rectal examination can replace per vaginal examination. A palpable painful nodule in the pouch of Douglas, tender rectovaginal septum and painful adnexa suggest the presence of endometriosis.

**Investigations<sup>7</sup>:**

Laboratory investigations or imaging is not required in case of primary dysmenorrhea. But if history and clinical examination suggest secondary dysmenorrhea, the following investigations can be done.

- **USG:** In adolescents in whom a pelvic examination is impossible or unsatisfactory, USG may diagnose a pelvic mass or an obstructive Mullerian malformation.
- **MRI:** Has limited value.
- **Hysteroscopy:** and Saline infusion sono hysterosalpingography are helpful for the diagnosis of endometrial polyp and submucosal leiomyoma.
- **Laparoscopy:** Is the best diagnostic tool for the establishment of endometriosis, PID, pelvic adhesion and congenital anomalies of the genital tract.

**Management approach of dysmenorrhea in adolescent**

First of all, we have to diagnose whether it is primary (90%) or secondary (10%) dysmenorrhea. When the history is suggestive of primary dysmenorrhea, empiric treatment should be initiated in primary health care.

**Treatment options<sup>5</sup>:****1. Nonpharmacological or complementary therapies**

- a. Heat therapy: Topical heat applied to the lower abdomen can reduce the intensity of pain by activating thermoreceptors and reducing the response to nociceptors, consequently reducing pain signals to the brain.
- b. Exercise: It is evidenced that low-intensity exercise like yoga and stretching is beneficial.
- c. Transcutaneous electric nerve stimulation/acupuncture/traditional Chinese medicine: There is some evidence for the use of transcutaneous nerve stimulation and acupuncture in improving dysmenorrhea.
- d. Diet: There may be a potential for certain supplements such as ginger, fish oil, magnesium, and vitamin B1 to improve dysmenorrhea.
- e. Behavioral interventions: Cognitive behavioral therapy such as relaxation training and desensitization may be adjuncts to pharmacological treatments.

**2. Pharmacological treatment**

- a. Nonsteroidal anti-inflammatory drugs: NSAIDs are the first line treatment and have been shown to be more effective than paracetamol as it inhibits cyclooxygenase enzymes, thereby inhibiting the production of prostaglandins. Effective treatment is initiated with the onset of bleeding and or associated symptoms. It is usually not required for more than 2-3 days. Recommended maximum dosing includes starting with an initial loading dose followed by a divided dose over 24 hours. The adverse effects of NSAIDs include gastrointestinal intolerance, headache, and drowsiness. It is important to take NSAIDs with food. Aspirin is not recommended for children and adolescents with influenza or chicken pox because of its association with the onset of Reye's syndrome.
- b. Hormonal medical treatment<sup>7</sup>
  - i. Combined Oral Contraceptive (COC): As early as 1937, researchers showed that dysmenorrhea responds favorably to inhibition of ovulation. COC suppresses ovulation and endometrial tissue growth, thereby decreasing menstrual blood volume and prostaglandin secretion with a subsequent decrease in intrauterine pressure and uterine cramping. COC with more than 35 mcg of ethinyl estradiol was more effective for pain relief and significantly decreased absence from work or school. In addition, the contraceptive benefit of OCP can be used for adolescents who are married but not willing to have a child. Consideration may be given to the continuous use of oral contraceptives for withdrawal bleeding and associated dysmenorrhea.
  - ii. Progestin regimens: Depot medroxyprogesterone acetate (DMPA) works primarily by suppressing ovulation. It also can induce endometrial atrophy. Amenorrhea rates are 55% to 60% at 12 months and 68% at 24 months, so DMPA may be considered in the treatment of dysmenorrhea. Progestin-only pill (POP) may decrease menstrual flow and up to 10% will develop amenorrhea.
  - iii. Levonorgestrel intrauterine system (LN-IUS): It reduces menstrual blood loss and 16-35% becomes amenorrheic and dysmenorrhea has been shown to improve.

**Follow-up for primary dysmenorrhea:**

When a patient is treated for primary dysmenorrhea, she should be kept in follow-up after 3-6 months. Response to treatment can be assessed by using visual analog scales and numerical rating scales. Both scales are reliable, valid, translated into spoken language and simple to administer. If a patient does not respond within 3-6 months, investigations should be done to diagnose the presence of any secondary causes. Evaluation can be done by physical examinations and proper investigations.

**Evaluation of the major cause of secondary dysmenorrhea:**

**Reproductive tract anomalies:** Any obstructive anomalies of the genital tract may cause secondary dysmenorrhea by forming hematocolpos and hematometra, which ultimately produce endometriosis. Correction of the obstruction and reconstruction of the outflow tract improves the symptoms and future fertility.

**Suspected endometriosis:****ESHRE guideline for endometriosis in adolescents<sup>8</sup>:**

- In adolescents, clinicians should take a careful history to identify possible risk factors for endometriosis, such as positive family history, obstructive genital malformations, early menarche, or short menstrual cycle.
- Clinicians should take a careful history and consider the following symptoms as suggestive of the presence of endometriosis:
  - o chronic or acyclical pelvic pain, particularly combined with nausea, dysmenorrhea, dyschezia,
  - o dysuria,
  - o dyspareunia
  - o cyclical pelvic pain.
- For diagnosis a transvaginal scan, MRI, transabdominal, transperineal, or transrectal scan may be considered.
- Serum biomarkers (e.g., CA-125) are not recommended for diagnosing, ruling out or evaluating the prognosis of endometriosis in adolescents.
- In adolescents with suspected endometriosis where imaging is negative and medical treatments (with NSAIDs and/or hormonal contraceptives) have not

been successful, diagnostic laparoscopy may be considered.

- The appearance of endometriosis is quite different in adolescents than in adult women. Here, the endometriotic lesions are typically clear or red and difficult to identify.

**Conclusion:**

Dysmenorrhea may negatively affect girls' quality of life both physically and psychologically. Primary care physicians are well enough to explore the symptoms and provide appropriate management and counselling. In the initial evaluation of dysmenorrhea, it is important to determine whether it is primary or secondary. If secondary dysmenorrhea is suspected or patients getting treatment for primary dysmenorrhea do not improve within 3 to 6 months, they should be referred to a gynaecologist for further evaluation. A holistic approach of patients with dysmenorrhea includes symptomatic treatment as well as consideration of psychosocial issues that often accompany the disorder. NSAIDs are the recommended first-line treatment for primary dysmenorrhea. COC or progesterone-only contraceptives can be used in those who desire contraception.

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