Adolescent Gynecology:

Dysmenorrhea, PMS-PMDD & Amenorrhea

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Objectives

• Understand the prevalence of dysmenorrhea

• Establish a treatment plan for dysmenorrhea

• Know the difference between Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD)

Resources


• Kauntz, AM. Hormonal contraception for suppression of menstruation, Falk, ST Editor Waltham, Massachusetts: UpToDate January 2011


• Polotsky, AJ. Amenorrhea caused by extremes of body mass: pathophysiology and sequelae. Contemp ObGyn August 2010, 18-23.
Endometrium

The endometrium is one of the most complex tissues in the human body. It is always changing.

Leon Speroff, M.D.
Clinical Gynecologic Endocrinology and Infertility

Endometrial Complexities

• The composition and function is determined by the dominant follicle
• Estrogen & Progesterone vary
• Cellular response varies

Endometrial Complexities

• Spiral arteries respond to estrogen, progesterone and prostaglandins
• Basal arteries do not respond
• PGF$_{2\alpha}$ vasoconstriction
• PGE$_1$ vasodilation
• The dominant follicle determines the estrogen/progesterone ratios and the prostaglandin ratios
Endometrial Regulatory Substances
Estrogen, Progesterone, prostaglandins, prostacyclin, thromboxanes, leukotrienes, interleukins, gonadotropin releasing hormones, inhibin, activin, interferon, colony stimulating factor, prolactin, relaxin, renin, epidermal growth factor, insulin-like growth factor, corticotropin releasing factor, fibronectin, tumor necrosis factor, testosterone, endorphin, dopamine, serotonin, & norepinephrine.
Speroff, Glass & Kase
Clinical Gynecologic Endocrinology and Infertility

Dysmenorrhea
• Pain and associated symptoms coincident with menstrual cycle
• Severity based on level of pain, presence of systemic symptoms, and impact on daily activities
• Prevalence in adolescents 60 – 93%

Dysmenorrhea Treatment
• Heat
• Tylenol
• Aspirin
• Midol

Dysmenorrhea
• Severe dysmenorrhea - 15%
• 2 million adolescents 15 - 19
• #1 cause of recurrent short-term school absence in adolescent females
• Intensity may vary from cycle to cycle
• May resolve after childbearing
**MIDOL Complete Caplets** provide relief of many symptoms suffered during your menstrual period. It contains a unique combination of a maximum strength pain reliever, a diuretic to help relieve bloating and caffeine to help fight fatigue.

MIDOL Complete is also available in Gelscaps. [Click Here to Learn More.](#)

**MIDOL Complete Caplets relieve all of the following menstrual symptoms:**

- Cramps
- Bleeding
- Fatigue
- Backache
- Headache

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**Active ingredients in each caplet:**

- Acetaminophen 600 mg Pain reliever
- Caffeine 50 mg Stimulant
- Pyrilamine maleate 10 mg, Diuretic

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**Uses**

- For the temporary relief of these symptoms associated with menstrual periods:
  - Cramps
  - Bleeding
  - Water weight gain
  - Headache
  - Backache
  - Muscle aches
  - Fatigue

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**Warnings**

- Liver warning: This product contains acetaminophen. Severe liver damage may occur if you take:
  - More than 8 caplets in 24 hours, which is the maximum daily amount.
  - with other drugs containing acetaminophen
  - 3 or more alcoholic drinks every day while using this product.

- Do not use with any other drug containing acetaminophen (prescription or nonprescription). If you are not sure whether a drug contains acetaminophen, ask a doctor or pharmacist.

- Ask a doctor before use if you have:
  - Liver disease
  - Glaucoma
  - Difficulty in urination due to enlargement of the prostate gland
  - A breathing problem such as emphysema or chronic bronchitis

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Dysmenorrhea

Treatment

- Nonsteroidal anti-inflammatory drugs
- Hormonal suppression of cycle*

*Dault, AM. Hormonal contraception for suppression of menstruation. Falk, ST (Ed) Waltham, Ma: UpToDate 2010

Dysmenorrhea

Treatment

- In an adolescent, if no relief consider pelvic inflammatory disease or endometriosis
- 50% without relief have endometriosis

Premenstrual Syndrome

Premenstrual Dysphoric Disorder (PMS – PMDD)

Cyclic occurrence of symptoms related to menses that are of sufficient severity to interfere with some aspects of life that appear with consistent and predictable relationship to the menses.

Premenstrual Syndrome

Premenstrual Dysphoric Disorder (PMS – PMDD)

Physical and behavioral symptoms that occur repetitively in the luteal phase of menstrual cycles and resolve with menses

Premenstrual Syndrome

Premenstrual Dysphoric Disorder (PMS – PMDD)

- Diagnostic criteria are both affective and somatic
- Genetic predisposition
- Neurosensitivity to fluctuations and ratios of Estrogen and Progesterone in the cycle
- Mediated by neurotransmitters serotonin, beta-endorphins, gamma-aminobutyric acid (GABA) on the central and autonomic nervous systems

PMS - PMDD

Epidemiology

- First described by Hippocrates
- Defined by Greene & Dalton in 1953
- 85% of menstruating women report one or more PMS symptoms
- 20-30% clinically significant symptoms
- 5-10% report significant mood impairment and meet the criteria for PMDD (DSM IV)*
- Variable in age of onset

*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, 1994
PMS - PMDD Diagnostic Criteria

- Affective lability
- Marked anger or irritability
- Marked anxiety or tension
- Marked depressed mood
- Anhedonia
- Fatigue
- Difficulty concentrating
- Marked change in appetite
- Hypersomnia or insomnia
- Mastalgia, cephalgia, edema, myalgia, arthralgia

Treatment of PMS

- Lifestyle modificiation
- Spironolactone diuretic reduces both somatic and mood symptoms
- Yaz – drospirenone & ethinyl estradiol
- Yaz – approved by FDA
- For financial considerations may consider traditional monophasic OCP
- OCP may not be effective if mood symptoms predominate
- Consider Depo-Provera

Treatment of PMDD - SSRIs

- SSRIs are initial drug of choice for PMDD
- Sarafem is fluoxetine 10 mg and 20 mg
- Approved by FDA: fluoxetine, paroxetine and sertraline
- Dosing schedules vary greatly
- Off label medications used are alprazolam, clomipramine, nefazodone, venlafaxine

Amenorrhea

Evaluate Based on Level of Control of Cycle

- Hypothalamus
- Pituitary
- Ovary
- Uterus
- Vagina

Primary Amenorrhea

- Absence of menses by age 16
- Concern if no sexual development by 14 -15
- Alert if no menses with sexual development and cyclic pain with or without a mass

Primary Amenorrhea Etiology

- Chromosomal - gonadal dysgenesis: 50%
- Hypothalamic hypogonadism: 20%
- Mullerian agenesis: 15%
- Imperforate hymen or vaginal septum: 5%
- Pituitary disease: 5%
- Androgen insensitivity, congenital adrenal hyperplasia, polycystic ovary syndrome: 5%
Primary Amenorrhea Evaluation

• Physical Examination
• Ultrasound
• FSH level

Primary Amenorrhea Imperforate Hymen

• 14 yo with primary amenorrhea
• Cyclic monthly severe abdominal cramping
• Tanner Stage 4 breast and pubic hair
• 14 week size lower abdominal mass
• Ultrasound – large fluid filled mass in central pelvis filling uterus and vagina
The Menstrual Cycle

- Menarche
- Reproductive Years
- Menopause

Incapable of Normal Menstrual Cycle Milestones

- Gonadal dysgenesis
- Androgen insensitivity
- Mullerian agenesis
- Transgender surgery

Primary Amenorrhea
Chromosomal - Gonadal Dysgenesis

- 24 yo active duty female
- As a teenager primary amenorrhea responded to cyclic estrogen and progesterone
- Chief complaint - BCP refill and vaginitis
- Physical Exam - typical Turner Syndrome and Trichomonas vaginitis
- Diagnostic laparoscopy - fibrous bands in location of normal ovaries
- Ovarian biopsy - no follicles

Primary Amenorrhea
Androgen Insensitivity Syndrome

- X-linked Recessive
- Karyotype 46 XY
- Defect in androgen receptor
- Phenotype – tall, slender, full breasted
- Absent mullerian structures
- High serum testosterone levels
- 2 - 5% incidence testicular carcinoma
Secondary Amenorrhea

- Absence of menses for more than three cycles
- Oligomenorrhea - less than 9 cycles in a year
- Etiologic and diagnostic considerations for oligomenorrhea are the same as for secondary amenorrhea

Secondary Amenorrhea Etiology

- Most common cause
- Second most common cause

Secondary Amenorrhea Etiology

- Most common cause - pregnancy
- Second most common cause - menopause

Secondary Amenorrhea Etiology

- Ovarian disease: 40%
- Hypothalamic dysfunction: 35%
- Pituitary disease: 19%
- Uterine disease: 5%

Secondary Amenorrhea Evaluation

- Urine pregnancy test
- Follicle Stimulating Hormone
- LH / FSH ratio
- Prolactin
- TSH
- Sono of endometrial lining & ovaries
Amenorrhea & Body Mass

- Discounted Ideal Body Weight
- Stressed Body Mass Index*
- Missed the importance of functional "percent body fat"
- Missed the importance of short term fluctuations in weight

*BMI - ratio of body weight in kilograms over the square of height in meters

Amenorrhea & Body Mass

- Functional hypothalamic amenorrhea with low body weight is associated with a 69% risk of coronary heart disease versus 29%*
- Functional hypothalamic amenorrhea with high body weight is associated with metabolic syndrome and endometrial carcinoma
- Psychopathology and psychotherapy emphasized at both ends of the spectrum


Secondary Amenorrhea

- 26 yo G 0 with 7 years amenorrhea
- Menarche 12 yo
- 3 – 4 menses per year till 16 yo
- Then one year amenorrhea
- PCP abdominal exam only – Rx with BCP
- Cycled for one year and then discontinued
- Now good job & relationship - wants pregnancy
- Classic PCO – BMI 40, hirsute, acanthosis nigricans, HCG neg, LH / FSH

Secondary Amenorrhea

- Rx with oral Provera withdrawal
- Evaluate for metabolic syndrome
- Lifestyle changes
- Treat with Metformin

Secondary Amenorrhea

- 34 yo G 1 with 1 year amenorrhea
- NVD four years ago
- Followed by three years regular menses
- Is 50 pounds above pre-pregnancy weight
- Past 18 months major family stresses with multiple malignancies and deaths
- Wants to be pregnant again
- Normal PE except weight 220 & BMI 36

Secondary Amenorrhea

- Evaluate
- Reassure
- Rx with cyclic estrogen and progesterone
- Lifestyle changes
- Refer to psychologist
A 16 year old female presents with a complaint of pelvic cramps with her menses over the past 2 years. She describes her periods as heavy and says they occur once a month lasting for 7 days, with no spotting in between. She has never been sexually active and does not expect this to change in the foreseeable future. An abdominal examination is normal.

Which one of the following would be the most appropriate next step?

A) A pelvic examination
B) Ultrasonography
C) A TSH level
D) Naproxen prior to and during menses

Answer: D

This patient is experiencing primary dysmenorrhea, a common finding in adolescents, with the estimates of prevalence ranging from 20% to 90%. Because symptoms started at a rather young age and she has pain only during menses, endometriosis or other significant pelvic pathology are unlikely. An infection is doubtful, considering that she is not sexually active and that symptoms have been present for 2 years. In the absence of red flags, a pelvic examination, laboratory evaluation, and pelvic ultrasonography are not necessary at this time. However, they can be ordered if she does not respond to simple treatment.

NSAIDs such as naproxen have a slight effect on platelet function, but because they inhibit prostaglandin synthesis they actually decrease the volume of menstrual flow and lessen the discomfort of pelvic cramping. Acetominophen would have no effect on prostaglandins.


A 19-year-old college freshman consults you at the request of her cross-country coach because she has not had a period in 2 of the last 3 months. She notes that her current training regimen is much more intense than in high school last year. She has an appropriate body image and denies caloric restriction. A pregnancy test at the student health center was negative. On examination she is lean and highly trained. Her examination is otherwise normal.

Which one of the following would be the most appropriate recommendation for this patient?

A) Estrogen supplementation
B) Cyclic oral contraceptive pills
C) Increased caloric intake
D) Bisphosphonate therapy
E) Discontinuation of elite-level athletics

Answer: C

This patient has exercise-related oligomenorrhea, but does not have the eating disorder that characterizes the female athlete triad. Menstrual problems in athletes do correlate with bone density loss and impaired recovery from exercise. Additionally, menstrual irregularity of varying severity is extremely common in female distance runners, perhaps affecting as many as 60%. Hormonal manipulation has not been shown to affect bone density, though it may produce withdrawal bleeding. Bisphosphonate therapy has been shown to be ineffective, and is not recommended in women of child-bearing age. The main issue in well-nourished female athletes seems to be that energy intake is not increased to match energy expenditures at high levels of training. Unlike those with the female athlete triad, there is little evidence that athletes without eating disorders suffer substantial harm from exercise-induced menstrual problems. Ending an athletic career for this reason alone is not justified.


A 20-year-old female long-distance runner presents with a 3-month history of amenorrhea. A pregnancy test is negative and other blood work is normal. She has no other medical problems and takes no medications.

With respect to her amenorrhea, you advise her:

A) to increase her caloric intake
B) that this is a normal response to training
C) to begin an estrogen-containing oral contraceptive
D) to stop running

Answer: A

Amenorrhea is an indicator of inadequate calorie intake which may be related to either reduced food consumption or increased energy use. This is not a normal response to training and may be the first indication of a potential developing problem. Young athletes may develop a combination of conditions including eating disorders, amenorrhea, and osteoporosis (the female athlete triad). Amenorrhea usually responds to increased calories intake or a decrease in exercise intensity. It is not necessary for patients such as this one to stop running entirely, however.