Where is My Menstrual Period?
The Female Athlete Triad
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Disclosures

• None
Case Presentation

• 16 yo presents to you with pain in her left ankle
• National competitive dancer - trains 5 hours qd
  – Limited caloric intake
• History of minor injuries
• No menses and no secondary sexual characteristics
• Exam remarkable for weight of 80 lbs (height 5 feet)
  – BMI 15.6

FEMALE ATHLETE TRIAD

...and I should care, why?
Question:

What 3 clinical entities make up the female athlete triad?

A. Eating Disorders, Osteoporosis, Amenorrhea

B. Low BMI, history of fracture, menstrual dysfunction

C. Low Energy availability, menstrual dysfunction, decreased BMD

D. Unsure
Female Athlete Triad

Movement along each spectrum between optimal health and pathology may occur at different rates according to diet and exercise habits.

ENERGY DEFICIT
Energy Deficit

• Energy Balance & Body Weight
• Energy Availability = Energy Intake – Exercise Energy Expenditure
• Low energy availability leads to:
  – Reduced metabolic rate/energy conservation
  – Menstrual disturbances
  – Disrupted bone metabolism

Question:

Which represents secondary Amenorrhea?

A. No menses by age 16
B. No menses for 6 months
C. Menses every 4 months
D. Unsure
Menstrual Disturbance

Hypothalamus

GnRH

Pituitary Gland

LH

FSH

Ovaries

Estrogen

Progesterone

Menstrual Cycle

Image sourced from American College of Sports Medicine 2011
Menstrual Disturbance

- Primary Amenorrhea
- Secondary Amenorrhea
- Oligomenorrhea
Question:

How do you define Osteoporosis in a premenopausal female athlete according to ACSM?

A. Z-score <= -2 with secondary clinical risk factors for fractures
B. Z-score <= -2 with history of fracture
C. Z-score -1 to -2 with secondary clinical risk factors for fractures
D. Unsure
Low Bone Mass

- Osteoblasts vs. Osteoclasts
- Stages of Bone Growth

Image sourced from American College of Sports Medicine 2011

Low Bone Mass

- Low Bone Density – a history of nutritional deficiencies, hypoestrogenism, stress fractures, and/or other secondary clinical risk factors for fracture together with a BMD Z-score between -1.0 and -2.0

American College of Sports Medicine
Low Bone Mass

- Osteoporosis – a history of nutritional deficiencies, hypoestrogenism, stress fractures, and/or other secondary clinical risk factors for fracture together with a BMD Z-score of <= -2.0

American College of Sports Medicine

Low Bone Mass

- Increased risks of musculoskeletal injury
Health Consequences

• Current and future bone health
• Fractures
• Reproductive dysfunction
• Impaired vascular endothelial function
• Psychological
• Nutrient deficiencies
• Gastrointestinal disorders
Performance Consequences

- Excessive fatigue
- Increased recovery time
- Impaired performance
- Decreased training response
Education

• Physician Education

• Family Education

• Community Education

Education

• Patient perceived risks
Prevention

• Screening
  – Low Energy Availability
    • Disordered eating – Screening Tools: EAT-26, EDI, EDE-Q
    • 3 or 7 day food record
  – Menstrual Dysfunction
  – Low Bone Mass
    • History of stress or low impact fracture
    • History of amenorrhea or oligomenorrhea > 6 months
  – Look for risk factors

Treatment
Treatment

• Energy Deficient
  – Food is Fuel

• Menstrual Disturbance
  – Hormonal therapy

• Low Bone Mass
  – Calcium (1200-1500 mg/day)
  – Vitamin D (400-800 IU/day)

Image sourced from: 2014 Female Athlete Triad Coalition Consensus Statement on Treatment and Return to Play of the Female Athlete Triad [1]
Conclusion

• Short term and long term consequences
• NOT an inevitable consequence
• Increased education and awareness
• Multidisciplinary approach to recognition & treatment
• Optimize health and optimize performance

Thank You!!

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