The Female Athlete Triad

Female athlete triad refers to the combination of 3 medical conditions—energy availability, menstrual problems, and weak bones—seen in competitive female athletes. Prevention of the female athlete triad is important because the triad can interfere with normal growth and development, cause injury, and result in loss of strength and endurance.

Here is information from the American Academy of Pediatrics about the 3 conditions and general guidance for prevention and treatment.

Energy availability

Energy availability issues (not having enough energy to fuel the body) occur when athletes eat fewer calories than their bodies need for growth, development, and exercise. Some athletes choose to limit their calories to improve performance or appearance. Other athletes are unaware that they aren't eating enough calories to meet the energy demands of their sport. An athlete may be eating enough for a nonathlete but not enough for an athlete.

For example, if an athlete only eats 2,000 calories per day but uses 3,200 calories, she is eating 1,200 calories less than her body needs. Not having enough calories (energy) can hurt performance, slow growth and development, and increase the risk of injury and illness. Eating disorders, such as anorexia or bulimia, are one cause of inadequate food intake.

Athletes of any sport may have low energy availability. However, athletes in sports that emphasize leanness, such as gymnastics, dance, diving, figure skating, long-distance running, and cross-country skiing, or sports that use weight classifications, such as wrestling, martial arts, and rowing, may be at greater risk of low energy availability.

Menstrual problems

Not eating enough calories can cause menstrual periods to become irregular (*oligomenorrhea*) or stop (*amenorrhea*). In young athletes who aren't eating enough calories, menstrual periods may not start when they should. *Primary amenorrhea* occurs when menstrual periods don't start before 15 years of age. Secondary amenorrhea occurs when regular menstrual periods stop for 3 months or more. *Oligomenorrhea* occurs when the time between menstrual periods is longer than 35 days. All types of amenorrhea can be caused by not eating enough calories for energy expended; they are not caused by low body fat or the stress of exercise.

Preparticipation screening for the female athlete

During a sports preparticipation examination female athletes may be asked the following questions related to the female athlete triad. If components of the female athlete triad are suspected, the doctor may perform an expanded physical examination.

- At what age did you begin menstrual periods?
- How often do you have a menstrual period?
- How long do your periods last?
- When was your last menstrual period?
- Have you ever taken birth control pills? If yes, when?
- How many meals and snacks do you usually eat each day?
- List the foods and drinks you had yesterday.
- List the foods and drinks you try to avoid.
- Do you drink milk or calcium-fortified orange juice? Do you eat yogurt or cheese? How much each day?
- What has been your highest weight, and when?
- What has been your lowest weight in the past 2 years?
- Are you happy with your current weight?
- What do you feel your ideal weight would be?
- Have you ever tried to control your weight by dieting? Vomiting? Laxative use? Diuretics? Exercise?
- What sports do you participate in?
- How much time do you spend training for each sport each week?
- Do you do extra workouts, such as aerobic classes, in addition to your sports training? How much extra time do you spend?
- Have you ever had a stress fracture? When?

Weak bones

When a young athlete doesn't eat as many calories as her body needs and has menstrual problems, her bones do not develop the normal strength. When this happens, a 16-year-old girl can have bones as weak as those of a 60-year-old woman. She may more easily develop stress fractures or, if severe, even compression fractures of the spine. This decrease in bone strength will continue until

she has normal periods again, but, even though she can regain some bone strength, she may never catch up to where she should be normally.

Prevention

The female athlete triad can be prevented by eating enough calories, including fat, protein, and carbohydrates. Most female athletes need a minimum of 2,000 to 2,400 calories per day. Not only will this prevent menstrual problems and weak bones, it will help the athlete perform better! If an athlete develops menstrual problems, she needs to see a doctor. It is not normal to skip periods or stop having periods. If an athlete cuts out the fats in her diet, decreases the amount of food she eats, loses weight, or skips periods, she should tell her doctor. Finally, if an athlete feels she needs to lose weight, she should consult her doctor first.

Treatment

An athlete not having regular menstrual periods should tell her doctor. The doctor needs to make sure there are no other reasons, such as thyroid disease, for menstrual problems.

If a lack of enough calories is the cause of the menstrual problem, it is important that the athlete increase her food intake. She will need to eat all of the nutrients her body needs, which include carbohydrates, fats, and protein. She may find it helpful to see a registered dietitian for nutrition counseling. The athlete should gradually increase her food intake until her menstrual periods return.

If it is difficult for the athlete to increase her food intake, she may need to decrease her exercise and sports activity instead. Once menstrual periods return, the athlete can slowly increase her activity again while increasing her food intake to maintain menstrual periods.

If an athlete is not having regular menstrual periods, she needs to eat 5 servings of calcium per day. A serving would be 1 cup (8 ounces) of milk, yogurt, or calcium-fortified orange juice or 1 ounce of cheese. Vitamin D is also needed because it helps the body absorb and retain calcium. Adolescents who do not get 600 IU of vitamin D per day through foods should check with their doctor about taking a supplement.

If an athlete struggles with increasing her food intake, her doctor may refer her to a mental health professional, such as a psychologist, for additional counseling.

Notes

American Academy of Pediatrics

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