The Female Athlete Triad: Who Falls Under the Umbrella?

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Female athletes were historically stereotyped as weaker, softer, less durable, and more vulnerable compared to male athletes. However, after the passage of Title IX—the federal civil rights law that prohibited sex discrimination in education, including athletics—participation in sports by girls and women skyrocketed from 7 percent in 1972 to 42 percent in 2012. Coaches, athletic trainers, and physicians also began to see an increasing number of women with eating disorders, irregular menstrual cycles, and reduced bone mineral density (BMD).

In 1992, the Task Force on Women’s Issues of the American College of Sports Medicine coined the term “Female Athlete Triad” to describe these interrelated pathologies. The triad was believed to most commonly affect women participating in sports such as gymnastics, ice skating, or endurance running that require the athlete to maintain a specific weight limit or image. However, many athletes remained undiagnosed because specific criteria for triad diagnosis remained elusive.

In 2007, the definition transitioned into a spectrum disorder involving low energy availability, amenorrhea, and decreased BMD. The female athlete triad “umbrella” covers athletes who have one, two, or all three of these components (Fig. 1). In fact, athletes with one or two of these components are much more common than those who have all three components. As many as 30 percent to 60 percent of female athletes in certain sports will have at least one of the three components. Athletes with any one of these components should be checked to see whether they have the others as well.

The first clue The most common manifestation of the triad that is seen in an orthopaedist’s office is a stress fracture. The incidence of stress fractures in female athletes is 1.5 to 3.5 times higher than in male athletes. The relative risk of a stress fracture among female athletes with amenorrhea is 2 to 4 times higher than in eumenorrheic females.

The reasons for the greater incidence of stress fractures in females are multifactorial. To determine whether the stress fracture is related to the female athlete triad, orthopaedic surgeons must ask appropriate questions, including questions about nutritional and menstrual history.

The most important consideration for young athletes is the fact that BMD can only be accrued within the first two decades of life. Once lost, BMD can never be regained. Thus, identifying triad risk factors early is crucial; otherwise, osteoporosis may develop later in the athlete’s life.

Increasing awareness Despite the transition to defining the female athlete triad as a spectrum of disorders, many athletes remain undiagnosed due to a low level of awareness in both the athletic and medical realms. The first awareness study on the female athlete triad was published in 2006. Of the 240 healthcare professionals surveyed, only 48 percent of physicians and 32 percent of medical students were able to identify the female athlete triad. Even more disturbing, only 9 percent of physicians felt comfortable treating a patient with the disorder.

A second study, also published in 2006, found that 43 percent of coaches could properly identify the three components of the female athlete triad, but only 8 percent of coaches always assessed the athlete’s menstrual function prior to sport participation.

Just this year, a survey evaluating awareness of the female athlete triad was conducted at three academic medical centers. Of the 931 physicians surveyed, only 37 percent had heard about the triad (Fig. 2). Orthopaedic surgery had the highest level of awareness (80.5 percent), followed by obstetrics and gynecology (55.2 percent), and physical medicine and rehabilitation/rheumatology (51.9 percent). Anesthesiology (9 percent), radiology (9.6 percent), and psychiatry (11.1 percent) had the lowest levels of awareness.

On average, only 21.1 out of the 3 components could be properly identified. All those involved in the care of

Putting sex in your orthopaedic practice

This quarterly column from the AAOS Women’s Health Issues Advisory Board and the Ruth Jackson Orthopaedic Society provides important information for your practice about issues related to sex (determined by our chromosomes) and gender (how we present ourselves as male or female, which can be influenced by environment, families and peers, and social institutions). It is our mission to promote the philosophy that male and female patients experience and react to musculoskeletal conditions differently; when it comes to patient care, surgeons should not have a one-size-fits-all mentality.

AAOS Now November 2013 aasnow.org