

Education Key to Preventing Female Athlete Triad

BY SUSAN LONDON

Contributing Writer

SEATTLE — Education and the collaborative efforts of a team of professionals are important for preventing the female athlete triad, according to Sharon H. Thompson, Ed.D.

The definition of the female athlete triad has been expanded recently, said Dr. Thompson, professor of health promotion at the Coastal Carolina University in Conway, S.C. Previously, the triad was viewed as consisting of disordered eating, amenorrhea, and osteoporosis. Now, athletes are considered to be affected if they have low energy, menstrual disorders, and low bone mineral density.

"The extent of disordered eating in athletes is really unclear," Dr. Thompson said at an international conference sponsored by the Academy for Eating Disorders. Studies suggest that perhaps two-thirds of female athletes are affected. Athletes who are not consuming enough calories often become deficient in nutrients as well, and some of these (calcium, vitamin D, vitamin K, phosphorus, magnesium, and fluoride) are critical for bone health, she noted.

Amenorrhea in female athletes is associated with a two- to fourfold increased risk of stress fractures, Dr. Thompson said at the conference, which was cosponsored by the University of New Mexico. But they may have other types of menstrual dysfunction, including oligomenorrhea, anovulation, and luteal phase deficiency, which also affects bones.

It would be rare to find a female athlete who has frank osteoporosis, Dr. Thompson noted. However, "we know that athletes who have amenorrhea have 10%-25% lower bone mineral density at their lumbar spine, compared to control athletes. Bone loss may be accelerated in this population by estrogen deficiency, low energy availability, and a decreased rate of new bone formation.

"Bottom line, female athletes should have higher bone mineral density than nonfemale athletes," she asserted. "Any female athlete who has lower bone mineral density is going to be more at risk for stress fractures and, it is also suggested, possibly more at risk for osteoporosis later on down the line."

Of note, Dr. Thompson said, the female athlete triad's low energy availability leads to the other two components (menstrual disorders and low bone mineral density), and this has implications for prevention. "It's important that people who work with female athletes not necessarily

look for all three of these together," she stressed. "The low energy intake itself can lead to other problems." And because the components can occur independently of each other, "prevention efforts are definitely needed for any of these problems."

A survey that Dr. Thompson conducted among 300 female collegiate cross-country runners found that 83% had body mass indexes within the average category (*J. Coll. Health. 2007;56:129-36*). Some (19%) had previous or current eating disorders, but only a quarter of this group had ever been treated. In all, 23% had irregular menstrual cycles, and 29% had inadequate calcium intake, raising concerns about bone health. "The conclusion from this study is the importance of nutrition education for athletes, especially in the area of calcium-rich foods that might be added to their diet," she said.

Educational efforts aimed at preventing the female athlete triad are lacking, according to Dr. Thompson. For example, fewer than 41% of Division I athletic teams and fewer than 33% of high schools have programs for their students that address eating disorders. Moreover, of high schools with such programs, 9% require athletes to attend, and 15% mandate the related education of coaches.

"It's important to realize, when [you screen] for the female athlete triad, that the main priority really should be looking for low energy intake," Dr. Thompson said. She recommended that screening questions be part of the routine medical history to avoid calling undue attention to them. And athletes suspected of having disordered eating should be interviewed in person and given surveys that have been validated in this population (*J. Athl. Train. 2008;43:80-108*).

When drafting educational programs for athletes, institutions can refer to guidelines from the National Collegiate Athletic Association and the American College of Sports Medicine, Dr. Thompson said. Such programs should present factual information and resources on eating disorders, nutrition, weight, and menstrual health to avoid any stigmatization, she advised.

In addition, athletes should be made aware that treatment is not only available, but also effective. "I think that when they realize [treatment] can be helpful, and their performance can increase and they can feel better, then that's hopefully very attractive," she said.

Noting that many coaches lack formal education on the female athlete triad, Dr. Thompson recommended mandatory, comprehensive training for this group at



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least annually so they are better prepared to prevent, recognize, and deal with the condition.

Certified athletic trainers can look to educational competencies for working with athletes outlined by the National Athletic Trainers' Association, according to Dr. Thompson. She noted that female trainers report feeling more confident in identifying athletes with eating disorders, which may suggest a need to better educate male trainers. Finally, she pointed out that 25% of trainers work at colleges that lack protocols for managing athletes with eating disorders, and recommended that universities—and high schools as well—establish such protocols.

"Prevention efforts do work and should be implemented," Dr. Thompson concluded. "It's important that a team of professionals be there to work with athletes." Mental health, athletic-training, medicine, and nutrition professionals; coaches; and athletic administrators "can all work together to improve the health of the female athlete."

Dr. Thompson reported that her survey was funded by a grant from the South Carolina Osteoporosis Coalition, and the South Carolina Department of Health and Environmental Control. ■

Ergogenic Agents Offer Few Benefits and Plenty of Risks

BY SUSAN LONDON

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VANCOUVER, B.C. — When it comes to improving performance in young athletes, the tried and true approaches—such as a balanced diet and adequate training—trump the energy drinks, supplements, and drugs.

Although anabolic androgenic steroids increase muscle strength, they have inconsistent effects on aerobic performance. These steroids are known to increase the risk of atherosclerosis, but new research has implicated them in the development of hypertrophic cardiomyopathy, Dr. Bernard A. Griesemer said at a meeting on pediatric and adolescent sports medicine sponsored by the American Academy of Pediatrics.

It is unknown whether young athletes who begin using steroids in seventh or eighth grade are at a higher risk for hypertrophic cardiomyopathy than are mature athletes using the same chemicals, said Dr. Griesemer.

Anabolic steroids also have prothrombotic effects, and "consequently, the risk for coronary thrombosis has been reported," said Dr. Griesemer of Missouri State University, Springfield.

The use of anabolic steroids for purely aesthetic and cosmetic purposes is on the rise, according to Dr. Griesemer. Several years ago, roughly 50% of users were noncompetitive body builders, but that value is now 78% (*Med. Sci. Sports Exer. 2006;38:644-51*). This means that increasing numbers of nonathlete middle school, high school, and college-age students are using these chemicals just to look good, he said, adding that "it's no longer just a sports medicine issue."

Drugs such as androstene and androstenediol, which were previously available as supplements under the Dietary and Supplement Health and Education Act of 1994, have since been reclassified as controlled substances, whereas others with similar physiological effects, such as dehydroepiandrosterone (DHEA), have not. "The classification of these chemicals as a

dietary supplement—you can get them at your local nutrition store—versus a class III controlled substance has probably more to do with politics and money than it has to do with biochemistry," he said.

Stimulants have many positive ergogenic effects, but they also adversely affect athletic performance, mainly by causing diuresis, which puts athletes at increased risk for dehydration. In addition, stimulants can impair thermoregulatory mechanisms, and that may lead to heat stroke, he said.

Two potent stimulants—taurine and glucuronolactone—are found in energy drinks such as Red Bull, Vault, and Monster, which are available in the United States but have been withdrawn from the European Union market because of the risk of sudden death in young athletes, according to Dr. Griesemer. The risk may be especially high for children taking medications for attention-deficit/hyperactivity disorder, he said.

The ergogenic effects of creatine vary among individuals, according to Dr.

Griesemer. It enhances performance in about a third of athletes, mainly those who play sports that require brief bursts of power, but even so, the gain is only 5%-7% at best. In another third of athletes, primarily those who play endurance sports, it negatively affects performance.

A related, newer phenomenon that physicians may encounter is "crystal vases," the term given to highly muscled young athletes who consume energy drinks and protein or creatine supplements, engage in intense activity on hot days, and become dehydrated, leading to rhabdomyolysis.

"[These kids] look gorgeous, but those muscles don't sprain or strain; they tend to shatter," Dr. Griesemer explained, noting that some affected young football players have creatine phosphokinase levels of 23,000 U/L or higher. Athletes taking selective serotonin reuptake inhibitors may be especially susceptible, said Dr. Griesemer, who reported that he had no disclosures in association with his presentation. ■