CASE REVIEW

The Need for Qualified Intervention for the Female Athlete Triad Syndrome Patient

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This report reviews the case of a collegiate runner who presented the female athlete triad syndrome (Triad). The case demonstrates the importance of correct intervention by physicians and athletic trainers and therapists (ATs) who work with female athletes. The elements of the Triad include disordered eating, amenorrhea, and early-onset osteopenia or osteoporosis. The condition may affect athletic young women who are involved in physical activities that emphasize leanness or endurance. Mere knowledge of the three components of the Triad is not sufficient to effectively manage the condition. ATs must be knowledgeable to recognize the signs and symptoms and to develop an appropriate management plan.

Disordered eating that does not meet the criteria for anorexia nervosa or bulimia nervosa is diagnosed as an “eating disorder not otherwise specified” (EDNOS). This may manifest itself as an energy deficit that results from consistent failure to replenish calories that are expended throughout the day. Menstrual irregularities associated with the Triad are divided into three categories: primary amenorrhea, secondary amenorrhea, and oligomenorrhea. A fourth, less widely-recognized category of menstrual irregularity is hypothalamic amenorrhea, which involves insufficient energy intake for proper hypothalamic regulation of hormone release, including gonadotrophic (e.g., estrogen and progesterone) hormones. When estrogen level is within normal limits, bone mineral density (BMD) is better maintained, but BMD is adversely affected by a low estrogen level. An overload of the combination of excessive physical activity and insufficient caloric intake may have a detrimental effect on BMD. ATs should have a high index of suspicion for the Triad when female athletes report amenorrhea or are diagnosed with a stress fracture.

According to the American College of Sports Medicine Position Stand on the Triad, “All individuals working with physically active girls and women should be educated about the female athlete triad and develop plans to prevent, recognize, treat, and reduce its risks.” The prevalence of the Triad is unknown, but the prevalence of eating disorders among young female athletes is high. Petterson et al. found that 50% of amenorrheic distance runners were osteopenic (5 of 10 cases). Permanent effects of the Triad are not completely understood, but some investigators have reported irreversible bone loss in female athletes with amenorrhea for more than three years.

This case involved an NCAA Division III female cross-country and track athlete who was diagnosed with the Triad. The history of the case spans a four-year period. The details illustrate the potential consequences of ignoring the signs and symptoms of the Triad or failure to accurately diagnose the condition.

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An 18-year-old female cross-country and track athlete (height: 160 cm, [5’3”]; weight: 38.6 kg [85 lb]) reported for her first collegiate preparticipation exam with clearance from her family physician for participation (Figure 1). She disclosed a previous history of undiagnosed foot pain during high school, amenorrhea for three years, and a previous diagnosis of...
hypothyroidism. She denied having been referred to a behavioral counselor or registered dietitian (RD). An endocrinologist had prescribed Synthroid (.088 mg/day) for the thyroid condition. Her hematocrit level was within normal limits, and hormone levels were not measured. The AT assumed that the family physician and endocrinologist had a better understanding of the athlete’s medical history and diagnosed hypothyroid condition, so she was cleared to participate. Her estimated caloric intake and energy expenditure were monitored by the head AT, using a weekly food diary that was maintained by the athlete. Although not requested by the head AT, the athlete also kept a detailed daily food journal.

When the athlete reported for the preparticipation exam as a sophomore, she weighed 5 pounds less than she had during her freshman year. A team physician and the head AT developed a plan for regulation of the athlete’s level of activity. According to The NCAA Sports Medicine Handbook, student athletes must be able to overcome resistance and sustain anaerobic and/or aerobic power. These fitness elements are influenced by caloric intake and body composition. Following NCAA Sports Medicine Guideline 2e, the athlete was restricted from participation until the following criteria were met: (a) a minimum of 12% body fat (± 3%), using hydrostatic weighing for determination of body composition, (b) a normal psychological assessment, using the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR); (c) a minimum body weight of 40.9 kg (90 lb); (d) family physician clearance; and (e) a meeting with an RD for assessment of the athlete’s caloric needs and development of a nutrition plan.

The athlete was found to have approximately 7% body fat, 2.8 kg (6.2 lb) of fat mass. A three-month goal was established for attainment of 40.91 kg of body weight and 9% body fat, and the athlete was restricted from participation until the goal was achieved.

The athlete was referred to the campus health and counseling center for an assessment, which resulted in a determination that she did not meet the criteria for diagnosis of an eating disorder. She had been strictly limiting her caloric intake, however, which is consistent with reports that the Triad may include a history of restricted caloric intake, without diagnosis of an eating disorder. The athlete initially agreed to meet with a counselor and RD to facilitate weight gain and to address other lifestyle issues, but she attended less than 10 sessions.

In addition to efforts to gain weight, the athlete was directed to focus on correction of muscle imbalances in her lower extremities through rehabilitative exercises and aquatic workouts. The aquatic workouts allowed her to maintain cardiovascular endurance while expending fewer calories than required for other modes of exercise. Three months after the initial assessment of body composition, she weighed 41.4 kg (91 lbs) and was estimated to have 16% body fat. The increase in body weight was favorable, but the body fat estimate may have been flawed, due to excessive residual volume of air in the lungs.

During her freshman year, the athlete experienced overuse injuries that included Achilles tendinitis and plantar fasciitis, both of which took longer than expected to resolve. Staff ATs suspected that her delayed healing was due to an energy deficiency. The head AT discussed the importance of a properly balanced intake of proteins, carbohydrates, and fats to meet the caloric demands of a collegiate cross country/track athlete.