

Awareness and Comfort in Treating the Female Athlete Triad: Are We Failing Our Athletes?

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ABSTRACT

Background: Recognition of the Female Athlete Triad (disordered eating, amenorrhea, osteoporosis) has increased significantly since it was defined in 1992 by the American College of Sports Medicine. However, knowledge and treatment of the Female Athlete Triad is still lacking among physicians and medical personnel.

Purpose: We surveyed physicians, physical therapists, athletic trainers, and coaches to determine their knowledge and comfort in treating the Female Athlete Triad.

Methods: A questionnaire was submitted to 240 health care professionals (physicians, medical students, athletic trainers, physical therapists, and coaches) in a metropolitan city.

Results: Forty-eight percent of physicians, 43% of physical therapists, 38% of athletic trainers, 32% of medical students, and 8% of coaches were able to identify all 3 components of the Female Athlete Triad. When physicians were subdivided into specialties, 69% of Physical Medicine and Rehabilitation (PM&R) physicians, 63% of orthopaedic surgeons, 53% of family physicians, 36% of pediatricians, and 17% of gynecologists were able to identify all 3 components of the Female Athlete Triad. Only 9% of physicians felt comfortable treating the Female Athlete Triad. When physicians were sub-

divided into specialties, 17% of orthopaedic surgeons, 13% of family practitioners, 12% of PM&R physicians, and 4% of pediatricians felt comfortable with treatment programs.

Conclusion: Data suggest that a heightened level of awareness and education in the proper treatment of the Female Athlete Triad is needed.

INTRODUCTION

Since the passage of Title IX in 1972, which mandated equal sports participation for both genders, the United States has seen an 800% increase in the number of girls involved in organized athletic competition. The positive aspects of this meteoric rise in numbers—physically, emotionally, and psychologically—cannot be overstated. Sports participation boosts self-esteem, fosters friendships with teammates, and can have dramatic beneficial repercussions for women's health. We have also realized from this explosion in sports participation that women are at risk for developing unique medical conditions, the most serious of which is the Female Athlete Triad (Triad). Recognized by the American College of Sports Medicine in 1992, the Triad consists of 3 inter-related conditions: disordered eating, amenorrhea (loss of menstrual periods), and osteoporosis (weak bones). More recent research suggests a link between the low levels of circulating estrogen in amenorrheic females and endothelial dysfunction.¹

Although significant research on this subject has been published as far back as the early 1980s, it wasn't until 1997 that the American College of Sports Medicine published the Female Athlete Triad Position Stand.² Unfortunately, many individuals who work closely with female athletes and issues surrounding their health know little about the Triad, despite several studies published in recognized medical journals. This study examines the extent of knowledge of physicians of different subspecialties, medical students, physical

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Table 1. Questionnaire Given to Physicians, Medical Students, Physical Therapists and Athletic Trainers

1. Can you identify the 3 components of the Female Athlete Triad?
2. What percentage of female athletes has an eating disorder?
3. Do you ask female athletes questions to try to elucidate an eating disorder?
4. What is the normal time of menarche?
5. What is the normal time of menarche for cross-country runners?
6. Do you ask female athletes about their menstrual cycle?
7. What are the health consequences of "athletic amenorrhea"?
8. Please list the benefits and detriments of birth control pills in female athletes.
9. What are the calcium requirements, in mg, for females age 11-24 according to NIH guidelines?
10. At what age do girls accrue most of their bone mineral density?
11. Do you screen female athletes for the Female Athlete Triad?
12. Do you feel comfortable treating the Female Athlete Triad?
13. How is the Female Athlete Triad treated?

Table 2. Questionnaire Given to Coaches

1. Is it "normal" for girls to stop having their period when they're playing sports?
2. What is the normal age for girls to start having their periods?
3. Do you ask about periods in your athletes?
4. Is there any benefit or detriment to birth control pills?
5. What are the calcium requirements for high school age girls (milligrams, servings)?
6. What is the Female Athlete Triad?
7. At what age do most girls form most of their bone strength for the rest of their lives?
8. How often do you weigh athletes?

therapists, athletic trainers, and coaches with regard to the issues surrounding the Triad.

METHODS

Five medical specialties (pediatrics: n=28, family medicine: n=38, obstetrics/gynecology: n=23, orthopaedics: n=24, physical medicine and rehabilitation: n=26), medical students (n=22), physical therapists (pts) (n=10), athletic trainers (ATCs) (N=31) from a hospital in a major Midwestern metropolitan area were given 13 questions (Table 1). Physicians were composed of BC/BE individuals in their respective fields. Three individuals receiving the questionnaire were dually certified as PT/ATC. A modified questionnaire was also distributed to team coaches (n=37) from 3 high schools and 1 col-

lege in the greater metropolitan area (Table 2). Years of coaching experience ranged from 1 to 32 years. Results were recorded as both number of correct answers and percentage of correct questions that had a right/wrong answer, as well as for questions that required a yes/no response.

RESULTS

Forty-eight percent of physicians, 43% of PTs, 38% of ATCs, 32% of medical students, and 8% of coaches could identify all 3 components of the Triad (Figure 1). When the results were further subdivided into different medical specialties, 69% of PM&R physicians, 63% of orthopaedic surgeons, 53% of family medicine physicians, 36% of pediatricians, and 17% of gynecologists could name the 3 components of the Triad.

When asked about screening for the Triad, 32% of medical students, 31% of physicians, 29% of PTs, and 26% of ATCs reported that they did screen their patients. When divided into subspecialties, 45% of family medicine physicians, 38% of PM&R physicians, 30% of gynecologists, 25% of pediatricians, and 13% of orthopaedic surgeons screen for the Triad.

Comfort level in treating the Triad was also reported. Eighteen percent of ATCs, 14% of PTs, 11% of physicians, and 0% of medical students felt comfortable treating the Triad. When physicians were subdivided into specialties, 17% of orthopaedic surgeons, 13% of family medicine physicians, 12% of PM&R physicians, 9% of gynecologists, and 4% of pediatricians felt comfortable treating the Triad (Figure 2).

Knowledge of calcium requirements was low in all groups. Thirty-two percent of medical students, 28% of physicians, 18% of ATCs, 13% of coaches, and 0% of PTs knew the correct calcium requirements for females ages 11-24. When physicians were further subdivided into specialties, 42% of orthopaedic surgeons, 42% of family medicine physicians, 22% of gynecologists, 15% of PM&R physicians, and 14% of pediatricians knew the calcium requirements (Figure 3).

In regard to disordered eating, 68% of ATCs, 51% of physicians, 43% of PTs, 41% of medical students, and 31% of coaches reported asking questions about disordered eating. When the physicians were broken down by specialties, 68% of family medicine physicians, 62% of PM&R physicians, 43% of pediatricians, 25% of orthopaedic surgeons, and 18% of gynecologists reported that they asked about disordered eating.

In regard to asking about the menstrual cycle, 79% of ATCs, 74% of physicians, 73% of medical students, 29% of PTs, and 16% of coaches ask female athletes this

question. When the physicians were broken down into specialties, 92% of family medicine physicians, 91% of gynecologists, 71% of pediatricians, 65% of PM&R physicians, and 38% of orthopaedic surgeons ask about menstrual cycles.

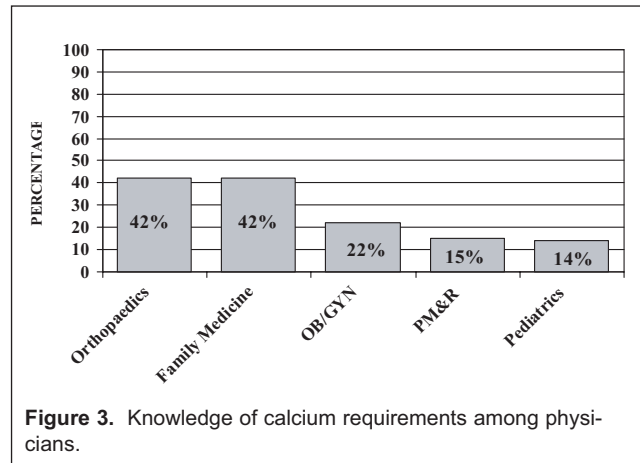
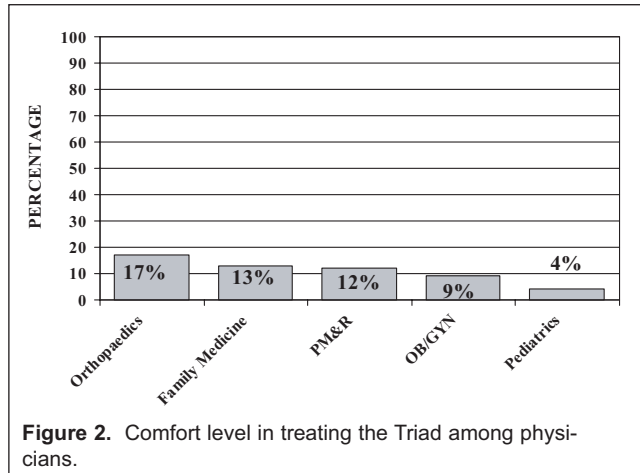
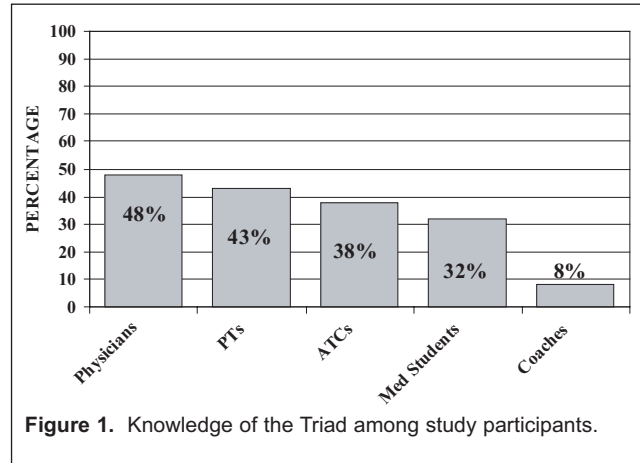
DISCUSSION

The Triad has dire consequences for young women. The interrelated conditions of disordered eating, amenorrhea, and osteoporosis can leave lasting harmful effects on the health of the women. In 1997, the American College of Sports Medicine came out with a detailed Position Stand on the Triad in which it emphasized its severity.²

While all women are at risk for developing the Triad, young women involved in competitive sports are at the greatest risk. Studies^{3,4} demonstrate that sports in which the judging is subjective, sports that require tight or revealing clothing (i.e. gymnastics, dance, figure skating), endurance sports, and those with weight categories have higher incidences of athletes suffering from the Triad. In a society that increasingly stresses thinness and a youthful appearing figure, many women become preoccupied with their body image and aim for unrealistic weight or appearance goals, which they attempt to achieve through such drastic measures as disordered eating and/or excessive exercise.

The term “disordered eating” encompasses a spectrum of behaviors that may manifest at the extreme end of the spectrum as anorexia nervosa or bulimia nervosa, or the milder side as a tendency towards a restrictive eating pattern, or simply inadequate caloric input in relation to energy expended. These disorders often stem from internal or external pressures to be thin. Often, athletes believe that being thinner will improve their performance ability, be it faster times in a race or a greater vertical clearance in a tumbling pass in a gymnastic floor routine. Ironically, these same athletes, by engaging in this type of behavior, often reduce their own potential. The lack of energy, combined with the frequent loss of muscle mass seen with disordered eating patterns, tends to diminish performance. Furthermore, the physiological release of glucocorticoids that accompanies a catabolic state, combined with a drop in performance, predisposes the athlete to suffering from lowered self-esteem and depression.

“Athletic associated amenorrhea” is the cessation of menses due to inadequate caloric intake. It was formerly believed that the stress of exercise and low body fat were the causes of amenorrhea. However, recent studies by Loucks³ have found that diminished energy



intake, rather than exercise stress or body fat depletion, was the regulating factor in the cessation of menses in active women. The direct cause of amenorrhea comes from a reduction in the frequency of the pulsatile release of gonadotrophic releasing hormone (GnRH) from the hypothalamus. This, in turn, leads to disruption of the

frequency of luteinizing hormone (LH) pulsatility from the pituitary gland. As a result, the normal hormonal cycle is disrupted and ovulation does not occur.³ The ultimate result of these events is the decrease in estrogen levels. Without estrogen, the body's ability to absorb calcium is impaired, along with the normal constitution of the bone reservoir in girls and young women at a crucial time in their lives. One major problem in dealing with the Triad is the widespread belief that it is "normal" for high intensity female athletes to be amenorrheic. In fact, many coaches and athletes believe the lack of normal menses indicates a sign of successful training. This lack of concern regarding the significance of exercise-induced amenorrhea may be a reason athletes do not report this condition to their physicians. Additionally, athletes who are training intensely are often not aware of suffering from a disordered eating pattern. In their estimation, they are still eating a "normal" amount and may well be unaware of their input to output caloric deficit.

The decreased bone mineral density (BMD) that occurs as a result of a relative lack of estrogen and its calcium absorbing properties ultimately leads to a higher incidence of injuries and stress fractures.² Studies suggest that the ability to reverse this downward trend of low BMD is limited and likely irreversible after a woman reaches her early twenties.² As the age of accrual of calcium for good BMD (age 11-14 years) for females corresponds to the time period when they are most at risk for developing the Triad, the knowledge and means to prevent the Triad are essential. Furthermore, recent studies have shown that college women runners with athletic-associated amenorrhea were found to have endothelial dysfunction, adding to the burden of the Triad.¹

As the results of this survey indicate, those individuals in the community most intimately involved in maintaining the health of female athletes are sorely lacking in their understanding of the Triad. In addition, even those who are aware of the Triad and its consequences are, by and large, not comfortable in treating it. This poses both a significant problem for the young athletes who are faced with the desire to be both competitive and healthy, and for the coaches, ATCs, physicians, and others whose lack of knowledge and comfort with such issues equates to a degree of failure in adequately helping them in both athletics and in later life.

In addition to the need for more widespread general knowledge about the Triad, more health care professionals who work with female athletes should ask questions regarding eating preferences, menstrual status, and bone health. Asking girls and women questions con-

cerning these 3 areas can target specific problems that many would otherwise be hesitant or unlikely to report, either because of the stigma associated with disordered eating, or the belief that what is happening to their bodies is "normal." Moreover, empiric evidence has shown that, when an individual attempts to manage all aspects of the Triad alone, the success rate is at or near 0. A multidisciplinary effort, or team approach, is needed, including individuals involved in the athlete's life such as a physician, psychologist, ATC, and certainly the parent(s). Having a detailed pool of information about these athletes also provides the individuals entrusted with their care a valuable edge in treating current and potential future problems.

CONCLUSION

Based on the preliminary numbers from this study, it is obvious that there needs to be a greater dissemination of knowledge concerning the Triad. This is a serious problem that can have long-term harmful consequences if not recognized and treated in a timely fashion. If the professionals who work with female athletes can learn to spot the signs of the Triad, in conjunction with the individual and her family, and provide a treatment plan, the end result of better athletic performance and life-long beneficial ramifications for bone health will arise. The team approach of persons knowledgeable of the Triad and qualified to treat this is essential, with each professional given a role in dealing with a particular aspect of the Triad and keeping open lines of communication with the others. Recognition and treatment of the Triad is truly a case where, as the saying goes, "an ounce of prevention is worth a pound of cure."

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