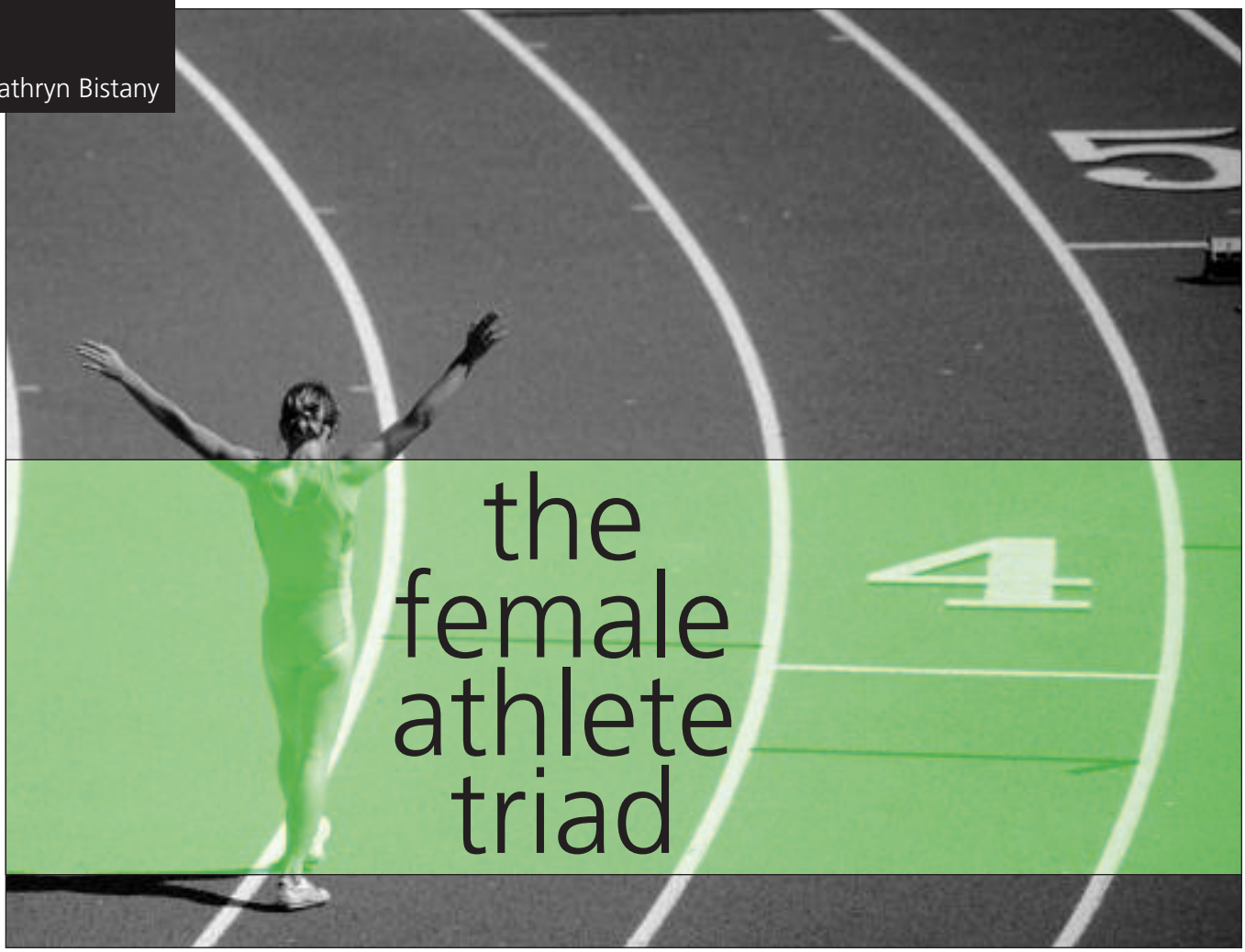
report: Kathryn Bistany



the female athlete triad

the female athlete triad refers to the interrelated problems of disordered eating, amenorrhoea and osteoporosis as determined by the task force of the american college of sports medicine in 1992, Kathryn Bistany explains

Those at risk of developing the triad are adolescents, women under stress and athletes.[1] In the athletic world, young female athletes appear to be most at risk as they are driven to excel in their chosen sport and pressured to fit a specific athletic image in order to achieve their goals. This puts them at risk of developing disordered eating patterns, which may lead to menstrual dysfunction and subsequent premature osteoporosis.[2,3,4] It is thought that the underlying cause of this problem is not exercising or participating in sports but rather the drive of girls and women to be unrealistically thin by restricting calorific intake in a misguided attempt to improve performance.[2,4,5]

what is disordered eating?

Disordered eating, which includes skipping meals, eating less, vomiting, the use of laxatives and the use of diuretics varies from mild to severe.[3,6] Severe disordered eating can lead to the clinically recognised eating disorders of anorexia nervosa or bulimia nervosa.[7,8]

Sports where disordered eating is prevalent include gymnastics, dancing, figure skating, long distance running and where the athlete is judged by appearance or low body fat is seen as an advantage.[3,4,9,10,11]

As athletes with disordered eating tend to be secretive about their behaviour, friends, parents, coaches and physicians must remain alert, looking for changes in behaviour such as eating alone, making trips to the bathroom during or after meals, or the use of laxatives.[12] Symptoms may include fatigue, anaemia, depression, intolerance to cold, lanugo (down-like hair that appears all over the body to act as insulation in the absence of body fat), eroded tooth enamel from vomiting, dry skin and hair loss.[3,9,12]

what is amenorrhoea?

Amenorrhoea is a spectrum of menstrual irregularities, which may be seen in female athletes, the three principal types observed being anovulation, luteal phase deficiency and athletic amenorrhoea.[1,6,13]

Anovulation is characterised by low progesterone levels, although the levels of oestrogen are adequate, resulting in no ovulation.[3,13] Luteal phase deficiency is a shortened luteal phase and insufficient progesterone.[13] The total menstrual cycle is usually of normal length making the deficiency difficult to detect.

Athletic amenorrhoea is classified as primary, whereby puberty is delayed and menses has not occurred, and secondary, whereby menstruation has stopped for three months, if cycles were regular, or six months, if irregular.[4,5]

Athletic amenorrhoea is thought to be hypothalamic-induced: production of the hypothalamic gonadotropin-releasing hormone

(GnRH) is reduced, leading to a reduction of oestrogen and progesterone release from the ovaries.[5,14,15]

A decrease in GnRH levels has been linked with higher levels of cortisol in amenorrheic athletes.[15,16,17] Although of possible short-term benefit, long-term elevated levels of cortisol accentuates loss of calcium from the bone, leading to a possibility of osteoporosis.[16]

It is important to note that menstrual irregularities can also occur in the absence of an eating disorder.[18,19] This may occur when demands for energy are high due to exercise, and the athlete may be energy deficient even though she may be consuming meals that would be considered normal for a healthy sedentary woman.[20] This has been observed in vegetarian athletes.[13] Furthermore, menstrual irregularities can occur before any substantial weight loss or in the presence (versus absence) of body fat as the threshold for onset of menstrual disturbances varies from person to person and from sport to sport.[3,9,21,22]

Athletic amenorrhoea is said to usually be reversible when the stresses responsible for its development are eliminated.[21] However, prolonged amenorrhoea may result in a shortfall in bone density, not necessarily restored after resumption of menses.[5,23,24]

what is osteoporosis?

Osteoporosis is a disease characterised by low bone mass, bone fragility and subsequent increased risk of non-traumatic fractures often associated with postmenopausal women.[15,25,26] The diagnostic criterion for osteoporosis is bone mineral density (BMD) more than 2.5 standard deviation below the mean of young adults, as measured by dual energy x-ray absorptiometry. Osteopenia describes BMD between 1 and 2.5 standard deviation below the mean of young adults. As this condition is significantly more prevalent than osteoporosis, it is suggested that osteopenia, and not osteoporosis, should be among the criteria for defining the female athlete triad syndrome.[27,28]

Bone mass is accumulated in the first three decades of life although peak mass is thought to be reached around 18-20 years.[1,5,9,27] The lack of oestrogen in young athletes with primary amenorrhoea puts them at risk of osteopenia as a consequence of inadequate bone formation.[3,5,25]

education programme

Any athlete presenting with any one of the disorders should be screened for the others.[18] Treatment lies in prevention and requires a multidisciplinary approach which includes psychological support and a reduction in training.[4,12,24,26]

Nutritional education is relevant to coaches, athletes and family members. The disadvantages of inadequate eating should be emphasised:

Most weight loss is due to loss of muscle tissue.

Low levels of lean body tissue makes training ineffectual.

Carbohydrate is essential for muscle glycogen stores.

Low energy intake depresses resting metabolic rate.

Eating orders may lead to amenorrhea and possibly osteopenia.[27]

Research has shown that nutrition may counteract or override the effects of an oestrogen deficiency on bone turnover.[29] Women with anorexia nervosa have been seen to have a gradual increase in bone mineral density with feeding, even without resumption of menses.[29]

Although studies differ on whether exercise alone is responsible for menstrual dysfunction, it is clear that athletes with an eating disorder, or not eating enough to meet energy demands, and following a strict exercise regime are at high risk of developing a menstrual disorder which may result in osteopenia. fn

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