History Is Key in Diagnosing Shortness of Breath

BY SUSAN LONDON
Contributing Writer

VANCOUVER, B.C. — Both exercise-induced asthma and vocal cord dysfunction produce shortness of breath in young athletes, and being able to differentiate between them is key to ensuring appropriate treatment.

Exercise-induced asthma (EIA) is a well-established condition affecting at least 15%-20% of athletes, according to Dr. Joseph A. Congeni, medical director of sports medicine at Akron Children's Hospital, Ohio. In contrast, vocal cord dysfunction (VCD) is a more recently recognized condition affecting 2%-5% of young athletes, though "these numbers are continuing to go up."

EIA affects the small airways, and its etiology is linked to dry air; allergens, pollutants, and irritants; and cold air, Dr. Congeni said at a meeting on pediatric and adolescent sports medicine sponsored by the American Academy of Pediatrics. Typically, it has multiple triggers besides exercise, but if exercise is the only or primary trigger, it is referred to as exercise-induced bronchospasm (EIB).

VCD affects the trachea, and its etiology is linked to laryngeal irritants, psychogenic disorders, and neurogenic conditions.

Because the two conditions produce overlapping symptoms, such as shortness of breath and cough, history is key to distinguishing them. Athletes with EIA may have wheezing, chest pain, and excess mucus production; their counterparts with VCD may have inspiratory stridor and voice changes, and may be pale or flushed. Of note, the cough of VCD is croupy and barklike.

"These kids sound like they are choking, and they can't catch their breath. It's very loud and noisy. EIA is not nearly as noisy," said Dr. Congeni. "The VCD presentation may be much more dramatic" and these athletes can wind up in the emergency department.

The timing of symptoms also may help differentiate between the two conditions, he noted.

EIA/EIB can often be diagnosed with an exercise challenge test (in which a reduction of pulmonary function by at least 15% is diagnostic), a eucapnic voluntary hyperventilation challenge (the preferred method used by the International Olympic Committee), a pharmacologic challenge, or an osmotic challenge. However, all of these tests are plagued by an inability to reproduce field conditions and may therefore yield equivocal results, he said.

"VCD is difficult to diagnose, and it is a diagnosis of exclusion," Dr. Congeni said. The best procedure for diagnosis is visualizing the cords while the athlete is symptomatic; however, it is rare to see attacks in the clinic. Pulmonary function testing may show a flattened or variable inspiratory curve—but this is seen clinically in only 20%-30% of cases. Other diagnoses that must be excluded are cardiac conditions, structural vocal cord abnormalities, and gastrointestinal reflux.

EIA/EIB is managed both with pharmacologic measures, primarily inhaled short-acting β_2-agonists, and with nonpharmacologic measures. The latter include environmental alterations, masks, nose breathing, warm-up before exercise, and dietary manipulations, such as increasing the intake of caffeine and antioxidants, and decreasing the intake of salt.

Children with VCD 'sound like they're choking ... It's very loud and noisy. EIA is not nearly as noisy.'

DR. CONGENI

A VCD attack is managed by urging the athlete to pant, to exhale making a soft "s" sound, and to use diaphragmatic breathing. Oxygen and sedatives may be given in the emergency department.

Education is essential to preventing future attacks of VCD, Dr. Congeni said, citing recommendations for management (Phys. Sportsmed. 1998;26:63-74).

These athletes also should be taken off any unnecessary medications. "Most have been on inhalers, which provide little, if any, benefit."

The three therapies for VCD are speech therapy (which focuses on breathing patterns), psychotherapy, and relaxation therapy with biofeedback. Dr. Congeni reported he had no disclosures in association with his presentation. ■

Meniscal Injury Raises Risk of Arthritis After ACL Surgery

BY MARK S. LESNEY
Senior Editor

The prevalence of osteoarthritis was comparable in patients undergoing anterior cruciate ligament reconstruction using either bone-patellar tendon-bone or hamstring tendon autografts, according to a retrospective study.

The presence of meniscal injuries, however, increased the prevalence of osteoarthritis (OA), the researchers said.

A total of 113 patients at a single institution who had symptomatic unilateral chronic anterior cruciate (ACL) reconstruction between April 1995 and May 1998 as part of three prospective randomized studies and who were available for follow-up were examined, according to Dr. Mattias Lidén and colleagues from the Sahlgrenska University Hospital, Göteborg, Sweden.

Ipsilateral bone-patellar tendon-bone (BPTB) autografts were used for reconstruction in 72 patients; the remaining 41 patients, referred to as the hamstring tendon autograft (HT) group, had reconstruction with either ipsilateral triple semitendinosus autografts (32) or quadruple semitendinous autografts (9).

The patients' median age was 28 years at the time of surgery, which was performed at a median of 18 months after injury. There were 49 men in the BPTB group and 29 in HT group. Most of the injuries were caused by contact sports (71%) and noncontact sports (15%), with no significant difference in degree of injury between sources of injury. Meniscal injuries were present in 69% of the BPTB group and in 68% of the HT group.

A single surgeon performed the procedures, in which fixation of both types of graft was done using interference screws. After standard rehabilitation, patients who attained full functional stability were permitted to resume running at 3 months and contact sports at 6 months.

Standard radiographic follow-up, performed according to the rating systems of Ahlbäck and Fairbank, was interpreted by a radiologist blinded to the type of graft used. Independent physiotherapists not involved in the rehabilitation process assessed patients pre- and postoperatively. The follow-up radiographic and clinical assessments were made at a median of 86 months after reconstruction (Arthroscopy 2008;24:899-908).

There was no significant radiological difference between the BPTB and HT groups with respect to osteoarthritis, according to radiological assessments. Overall, OA was found in 23% of patients, according to the Ahlbäck rating system (25% of BPTB and 20% of HT), and in 74% of patients, according to the Fairbank rating system (76% in the BPTB and 71% in the HT groups). However, patients with meniscal injuries treated before, during, or after the index operation had significantly more OA findings in both systems than did patients without such injuries, the authors stated.

On the basis of the slight yet significant correlation between time of injury to reconstruction and the cumulative number of positive Fairbank changes, the authors said patients should undergo reconstruction as soon as possible after injury to minimize future meniscal injuries and the development of OA. ■

Warm-Up Program Curbs ACL Injury in Female Soccer Players

BY MARK S. LESNEY
Senior Editor

An alternative on-field warm-up program reduced the risk of anterior cruciate ligament injury in collegiate female soccer players, especially those with a previous history of such injuries.

The Prevent Injury and Enhance Performance (PEP) program consists of warm-up, stretching, strengthening, plyometrics, and sports-specific agility exercises intended to address potential deficits in the stabilizing muscles around the knee joint.

The study tested the PEP program during the fall 2002 soccer season and involved 69 participating Division I National Collegiate Athletic Association women's soccer teams.

A certified athletic trainer for each team supervised each training session and communicated the results, including participation and injury reports. A total of 34 interventional teams (583 athletes) performed the PEP program regimen, and 35 control teams (852 athletes) performed their regular warm-up routine; 8 interventional programs dropped out of the study before completion and were not included in the analysis, wrote Dr. Julie Gilchrist of the Centers for Disease Control and Prevention and her colleagues.

An anterior cruciate ligament (ACL) injury was counted only if the certified athletic trainer reported confirmation by magnetic resonance imaging, arthroscopy, or direct visualization during repair. A contact injury was defined as an ACL injury sustained as a result of direct contact to the knee or another body part during play. A noncontact injury was one resulting without extrinsic contact with another player or object (Am. J. Sports Med. 2008;36:1476-83).

A comparison of noncontact ACL injury rates between the interventional and control groups showed the most substantial differences in injury rates. The ACL injury rates tended to be lower for all interventional and control comparisons.

The researchers attributed the lack of significant differences in other areas of injury, despite the downward trend, to the fact that it takes time for the benefits of neuromuscular training to manifest, which would explain why differences in ACL injury rates were more pronounced toward the end of the season. Overall, the program seems to reduce the risk of noncontact ACL injuries, especially in athletes with a history of ACL injury, they concluded.

Several authors of this paper participated in the development of the PEP program but had no financial interests in it. ■

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Athletes with a history of ACL injury stand to benefit in particular from the program.