

The Sickle Cell Athlete: What Administrators, Coaches Need to Know

By Torrance Williams

Sickle Cell Trait (SCT) is not a disease, but a description of a type of hemoglobin gene. Hemoglobin is what carries oxygen in the bloodstream. SCT differs from Sickle Cell Anemia (SCA) in that the trait is present when one gene for sickle hemoglobin is inherited from one parent while a normal hemoglobin gene is inherited from the other. If a sickle cell gene is inherited from each parent, the child will then have SCA.

SCA is a serious disorder that typically causes severe medical problems early in childhood and continues into adulthood. People with SCT rarely have any problems. In fact, more than three million Americans are SCT-positive and generally live normal healthy lives. (Bergeron, 2004) However, they may develop problems under extreme physical stress or with low oxygen levels (high altitude).

People with ancestors from Africa, Mediterranean countries, India, South or Central America, and Saudi Arabia are at high risk for having SCT. SCT occurs in about eight percent of the African-American population in the United States. The National Collegiate Athletic Association (NCAA) currently recommends that the sickle cell trait status of all college athletes be determined.

The U.S. Armed Forces first linked SCT to an increased risk of sudden death during extreme physical exertion several decades ago. SCT has also been linked to several deaths occurring during off-season conditioning in collegiate football players in the past 15 years. At this point, SCT does not appear to be as significant of an issue in high school athletes as it is at the college level. This is likely due to the fact that the intensity and duration of physical activity in high school athletes does not reach the intensity seen in collegiate conditioning activities. It does, though, still represent a potential cause of death or serious illness in athletes that is completely preventable. Thus, this brief overview of SCT can help you develop a plan to prevent your athletes from suffering a crisis.

A Quick Lesson on the Sickle Cell Trait

SCT is the inheritance of one gene for sickle hemoglobin and one for normal hemoglobin. (Association, 2009) The sickle gene is very common in individuals who have ancestry from areas where malaria is prevalent.

The “sickled” cells are unable to move through blood vessels normally, resulting in limited blood flow to muscles, kidneys and other vital organs. When tissue cannot get blood, the tissue dies and becomes necrotic. Sickling may begin as early as two to three minutes of sustained maximal exertion, such as wind sprints in football or running laps in basketball (Browne, 1993). The more the athlete exerts himself or herself, the earlier and greater the sickling of the red blood cell (Jones, 1970). A potential catastrophe can be prevented in the athlete with SCT by identifying those at risk, anticipating common problems, and observing the signs of early problems. Taking the following simple steps can save a life!

Identify the SCT Athlete

The pre-participation physical form should have a question about the athlete’s sickle cell status. If the athlete or parents are unaware of the athlete’s status, they may very likely be able to find the information from their primary care physician or state screening records. While the NCAA has recommended screening of all athletes, currently no medical organization is calling for the screening of SCT in high school athletes. Parents who are interested in having their child screened for SCT should discuss it with their physician.

When those student-athletes with SCT are identified, it is important that the student-athlete and his or her parents are educated on SCT. It is important to not discourage the parent or the athlete from sports participation. However, they must be educated on preventive measures and the potential dangers. It is vital that the necessary personnel, i.e., certified athletic trainer, coaches and athletic director, are informed of the athlete’s status, but it is also important to protect the student-athlete’s privacy.

Develop an Emergency Action Plan

Hopefully you already have an emergency action plan (EAP) in place for all of your sports and venues. If not, then such a plan must be developed. The EAP should be curtailed to your school dynamics, and should be very detailed to the point where a complete stranger could understand and implement it.

Know the Signs and Symptoms of a Sickling Crisis

One of the reasons that it is so important to identify which of your athletes has SCT is so that coaches and athletic trainers can distinguish between a sickling crisis and an exhausted athlete during practices and conditioning drills. How is a football coach to know when to allow the athlete to rest or when to “encourage” him to work on his fitness, and to teach the player not to quit? If you look at the signs and symptoms below, you will see how many athletes show these signs and symptoms every day, but may not have SCT. In any case, all athletes – those with SCT or not – should always have plenty of water breaks throughout practice, and good judgment should always be used when coaching adolescents.

Here are some of the signs and symptoms of an exertional sickling crisis:

- a. The athlete may complain of pain, or cramping in the legs, back or stomach
- b. Difficulty breathing
- c. Extreme fatigue
- d. Collapsing, fainting or passing out

SCT is very complex and can be life-threatening. However, if the proper steps are taken, these symptoms are generally easy to manage and normally subside within a few minutes. The athlete's symptoms normally subside when he or she is hydrated and rests. During hot weather, the athlete should also be taken into a cool, controlled environment to prevent overheating. If at any time the athlete collapses (sickle collapsing), this is a true medical emergency! EMS should be activated and an AED should be readily available.

Alter Practice and Training for the Athlete with SCT

Athletes with SCT can generally perform at the same physical level that their teammates can; however, they may not be able to do it for an extended amount of time. For example, the athlete with SCT should not run timed, sustained 100-yard sprints, or timed sustained "suicides." The athlete can still run sprints and suicides, but the athlete with SCT must have more rest in between sprints.

According to research, there has never been a single death associated with SCT during a game. All of the deaths have occurred during in-season or out-of-season conditioning drills. Coaches and athletes must be aware of the athlete's limits! If the athlete is feeling exhausted, or is showing symptoms of a crisis, the athlete must immediately stop, hydrate and rest.

If an athlete is known to have sickle cell trait, the following precautions are suggested during physical activity:

- Set own pace
- Engage in slow and gradual preseason conditioning regimen
- Use adequate rest and recovery between intense drills
- Stop activity immediately upon struggling or experiencing muscle pain, abnormal weakness, undue fatigue or breathlessness
- Stay well hydrated

While caution must be taken, the SCT athlete should always be allowed to compete in all sports, and should be treated the same as the other athletes. It needs to be emphasized that these athletes normally do not have problems, except if put under extreme physical duress. The precautions and training modifications discussed in this article are intended to allow the athlete with SCT to participate in athletics as safely as possible. If you have further questions regarding this issue, contact your state association's medical advisory committee.

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