



Sports Shorts

GUIDELINES FOR PARENTS

Iron in Athletes: is there a role for measuring ferritin levels?

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Iron is the essential mineral the body uses for oxygen transportation and energy production. Iron is absorbed in the diet in two main forms, free iron and iron from animal products. Free iron is found in foods such as beans, spinach, fortified cereals and dried fruits whereas animal-based iron (containing a molecule called heme) is found in meat, poultry and seafood. Animal-based iron is more easily absorbed than free iron. Iron in the body is tightly controlled by a constant balance between iron from our diet, iron breakdown mainly through breakdown of red blood cells and iron recycling within the body. Most people, including athletes, have normal levels of iron, however endurance athletes and female athletes, are more likely to suffer from iron deficiency. Iron discussions tend to focus on the state of being anemic, or not having enough red blood cells. However this article will focus on the iron deficient state without anemia.

How is iron deficiency defined?

Most of the iron in the body is contained in red blood cells. Because of this, iron deficiency has traditionally been linked to having too few red blood cells, also known as anemia. However, there exists a spectrum of iron deficiency which begins prior to a drop in hemoglobin levels. Unfortunately, there is less agreement about this 'pre-anemic' state. Ferritin is the molecule that is responsible for binding extra iron in the body and serves as the body's iron storehouse. Fortunately, there is a simple laboratory test that can measure one's ferritin level. This level, when low, is the best way to identify iron deficiency without anemia.

How is iron related to athletic performance?

Iron is essential for proteins that generate energy during aerobic exercise. Thus iron deficiency tends to primarily affect endurance athletes and can be seen as a drop in energy during prolonged exercise.

What are the symptoms of iron deficiency in athletes?

- Fatigue
- Lack of energy
- Apathy
- Worsening performance throughout the sports season

Should my child be screened for iron deficiency?

There is a lack of consensus for iron deficiency screening in all youth athletes. While some suggest routine screening of asymptomatic patients, particularly endurance female athletes, there is no compelling evidence to screen athletes

without symptoms of iron deficiency. Generally, it is accepted that endurance athletes with the above symptoms may benefit from laboratory evaluation to rule out iron deficiency and anemia.

Can iron supplementation improve iron deficiency?

Several studies have shown that both increasing iron within the diet and utilizing supplemental iron (taking an iron pill) can improve both exercise capacity and endurance. It is important to start by increasing dietary intake of iron-containing foods because the typical American diet is relatively poor in iron content. Particularly, vegetarians often have lower iron stores given the decreased absorption of free iron compared with animal-based iron. Supplementation with an iron pill is generally considered when the athlete has a low ferritin level. Supplementation ranging from 20-100 mg of elemental iron per day for 6-12 weeks can improve serum ferritin concentrations.

What foods are rich in iron?

- Red meat
- Beans
- Poultry
- Spinach and other dark leafy greens
- Pork
- Dried fruit, such as raisins and apricots
- Seafood
- Iron fortified cereals

Summary and recommendations

Iron deficiency in the youth athlete is a relatively rare condition but is more prevalent in female athletes and endurance athletes. Indicators such as fatigue, worsening exercise performance or lack of energy can be signs of iron deficiency. Ferritin is an acceptable marker of iron storage – low levels may indicate iron deficiency. Supplementation with iron pills along with dietary modification to increase iron consumption can increase iron stores and improve performance in these individuals. It is important to note that there is little research on iron supplementation for individuals without defined iron deficiency. It is not recommended to supplement with iron pills or make specific changes to one's diet in the absence of known iron deficiency. Use of vitamin C (for example, drinking orange juice) during supplementation can improve absorption. Side effects of supplementation include nausea, upset stomach, and constipation. When discussing iron supplementation, considerations of the risks and benefits should be discussed.