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Muscle Cramps and Spasms: The Electrolyte Misconnection

Muscles need sufficient electrolytes--sodium, magnesium, potassium and chloride—in proper balance to function properly. The body manipulates the balance of these minerals inside and outside of muscle cells in order to get the muscles to contract and relax. An imbalance or deficiency of these electrolytes can cause problems with the body's electrical impulses and lead to muscle cramps and/or muscle spasms. Low levels of any of these minerals can allow the muscle to contract, but prevent it from relaxing.

Electrolyte imbalances can occur due to deficiencies in the diet, sweat, urination, diarrhea, medication side effects, from consuming diuretics, and from problems with absorption. Electrolyte deficiencies can also be caused by increased demand for minerals in the body such as in the case of pregnancy or healing. Muscle cramps often occur in middle-aged and older people and are common in athletes. Some researchers believe a mineral imbalance can negatively affect blood flow to the muscles and that a deficiency of some minerals, like potassium, can interfere with the muscles' ability to use glycogen, a sugar that is the muscles' main source of energy.

Long-distance runners and cyclists, even individuals who exercise regularly, are prone to cramps. Often, these individuals have electrolyte deficiencies or imbalances because they lose critical electrolytes in sweat. Other factors associated with muscle cramps include dehydration, inactivity, or remaining in a particular position—for example on a bicycle—for long periods of time; anatomical conditions, such as flat feet; physical conditions, such as pregnancy; or the use of certain drugs, i.e., diuretics.

So what can you do to ward off painful muscle cramps or provide relief should one happen to strike?

First, consider adding essential electrolytes, i.e., sodium, magnesium, potassium before cramping occurs, etc. Sodium is one the primary electrolytes lost through sweat and is a nutritional concern if your intake is low, if you sweat heavily during exercise, or if you exercise for long periods of time. Besides sodium, other important electrolytes are magnesium, potassium, and chloride. Magnesium, for instance, is an essential mineral involved in muscle function that helps muscles to contract and relax. A few years ago, researchers in the United Kingdom found that 300 mg of supplemental magnesium reduced nighttime or nocturnal leg cramps in individuals who suffered chronic leg cramps. Like magnesium, potassium is an electrolyte found in your muscles. In fact, when your

What Causes a Muscle Cramp? What's the Quickest Way to Get Relief?

muscles contract, they release potassium into the surrounding tissue. Chloride is an electrolyte that helps your body regulate the level of fluids in your body. Chloride is an important electrolyte to remember, since dehydration can be a contributing factor to muscle cramps.

“Electrolytes are certain minerals that play an important role in muscle function. Low levels of any of these minerals can allow the muscle to contract, but prevent it from relaxing.”

A second preventative measure, especially if you sweat in hot weather, exercise for long periods of time, or work in hot conditions, is to maintain adequate fluid intake. Dehydration can be life threatening, but did you know that mild dehydration reduces your blood volume, which, in turn, can reduce the supply of oxygen to your muscles? When the oxygen supply is reduced to the muscles, they can go into spasm. Be sure to drink plenty of fluids containing electrolytes during physical activity, or throughout the day if you are prone to nighttime cramps. Keep in mind, however, that many sports drinks can contain high quantities of sugar, which can lead to stomach distress during strenuous activity or excessive calorie intake during less active times.

If a cramp does occur, there are some steps you can take to relieve the pain. First, try stretching the affected muscles. For calf-muscle cramps, for instance, try stretching your calf muscle by pulling your toes towards your knees with the affected leg extended straight. Second, relax in a warm bath or take a hot shower (allowing water to hit the affected area) to help relax the muscle. Third, gently massage the affected area, being careful not to apply too much pressure. You can also apply an ice pack to the sore muscle to reduce pain and swelling. If the affected area still hurts, treat it like you would an injured muscle, which means resting the affected leg and avoiding any further muscle strain.

Finally, if you have chronic or severe leg cramps, contact your doctor. It may be the sign of a more serious condition, so it's important to check with your physician first.

Sources:

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