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Muscle Cramps: An Ignored Medical Challenge

“Muscle fibers kind of go bananas on their own. When it happens, it hurts like hell”

by Joan Arehart-Treichel

Everybody gets muscle cramps some time or another. Some 35 cramps of the upper extremity have been described in medical literature. They include writer's cramp, violinist's cramp, telegrapher's cramp, typist's cramp, suitcase carrier's cramp. Shoulder, arm and hand cramps afflict tailors, carpenters, cigarmakers, jewelers, barbers, lithographers, miniature painters and dentists. Some curious cramps have been described. A waiter encountered cramps only when he served hors d'oeuvres with fork and spoon.

Cramps of the middle include stomach spasm and low back pain. People get leg cramps from swimming, golf, football, climbing mountains, by getting kicked in the calf. “Charley horses” (strained muscles) can knot your leg so badly during the night that you have to leap out of bed. Sprained muscles (with a tear) often cramp. Buckling knees may be caused by cramps in the thigh. Women often get leg cramps late in pregnancy.

Even though cramps are common and sometimes excruciatingly painful, they are one of the most ignored of all medical challenges. “After all,” one researcher sniffs, “Who has ever died from muscle cramps?”

While cramp research is unlikely to earn a Nobel Prize or a Lasker award,

some investigators are still interested in studying cramps. But there are some research obstacles. Notes William Kennedy, a muscle scientist at the University of Minnesota, “I have never seen a rat or cat with muscle cramps.” So there is no animal model for studying cramps. Other investigators admit to the inherent complexity of cramps. Says Donald Erickson, a physical medicine specialist at the Mayo Clinic, “This is a complicated problem.” Adds a Georgetown Medical School scientist, “You are getting into the fine tuning of neurology with this stuff.”

Still, a few formal studies on ordinary muscle cramps have been undertaken by some scientists—notably Denny Brown of Harvard; Forbes H. Norris Jr., who studied swimmer's cramps while in medical school, and Edward H. Lambert of the Mayo Clinic, one of America's outstanding electromyographers (scientists who measure the electrical activity of muscle). In addition, researchers and clinicians have observed cramps informally and have come to some hypotheses about their causes and formation.

They all agree that ordinary muscle cramps often occur after strenuous exercise, salt depletion or some other imbalance of ions as can occur late in pregnancy. They also agree that muscle

cramps are painful. Most also agree that cramps consist of severe or prolonged muscle contraction. There are a few dissenters from this view, however.

“From everything we know,” Robert B. Layzer, a neurologist at the University of California School of Medicine declares, “ordinary muscle cramps come from nerves. That is what electromyography indicates.” In other words, the electrical patterns recorded in a muscle during a cramp resemble that seen as the result of a nerve stimulus rather than that seen when a muscle acts spontaneously in the absence of instructions from a nerve. From the appearance of the electromyogram during a cramp, the cramp looks as if it ought to be the result of nerve firing. “Cramping,” says Layzer, “is probably the result of excessive nerve firing.”

If you carry a suitcase for any period of time, for example, your brain sends a message to your hand to support the suitcase. After you put the suitcase down, the nerve is so hyperstimulated that it continues to tell muscles in your hand to contract. So your hand supercontracts (cramps).

Irritation of sensory nerves from sprains or strains may also cause cramps, reports Daniel Halpern, a physical medicine specialist at the Uni-

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versity of Minnesota. The message from sensory nerves near the sprain or strain might enter the spinal cord. The message would then pass from the spinal cord along nerves that control muscles near the site of the sprain or strain. The electrical impulse would cause the muscles to contract (cramp).

Although the evidence underscores a nerve cause for ordinary muscle cramps, researchers are still intrigued by the possibility that some cramps may be triggered by a phenomenon in muscle itself. Observes Donald Cooper, physician for the athletic department of Oklahoma State University and a member of the American Medical Association Committee on the Medical Aspects of Sports: "During cramping, muscle fibers kind of go bananas on their own. When it happens, it hurts like hell." Jay Wells of the National Institute of Neurological Diseases and Stroke reports that cramp-like affairs can be induced in isolated muscle with certain physical phenomena or drugs. If isolated muscle is subjected to a sudden change in atmospheric pressure, it contracts. If caffeine is put on isolated muscle, the muscle contracts. Some clinicians believe that cramps might sometimes be caused by blood clotting in muscle, because they have felt nodules in cramped muscles that may be clots. In fact, Essam Awad, a researcher in physical medicine at the University of

Minnesota, has actually seen nodule-like abnormalities in cramped muscle taken from patients. Whether nodules are clots and are a cause of cramps, though, remains to be proven.

The only proven instances of cramps being caused by a local phenomenon in muscle occurred in persons with deficiencies of muscle enzymes. Their muscles were not able to break down fat properly or to use ATP (energy-releasing molecules) efficiently, and somehow these deficiencies triggered cramps. But such deficiencies are not the cause of ordinary muscle cramps.

However complex and controversial the causes of ordinary muscle cramps are, treatment is relatively pedestrian. When athletes get cramps, Cooper massages their muscles to get blood flowing into them and to correct any electrolyte imbalances. The best way to correct leg cramps is to stand and stretch the cramped muscles. "Try to go against the tendency of the muscle to ball up into a knot," says Cooper. "Because, boy, when they ball up into a knot they really hurt." Prescription and non-prescription muscle relaxants, or aspirin, may help relieve cramps.

The best preventive against cramps, Cooper advises, is warm-up exercises, if you anticipate engaging in strenuous activities. Warm-up exercises stretch muscles and increase their blood supply. □

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